

BURKINA FASO
MINISTRY OF AGRICULTURE,
WATER RESOURCE, SANITATION
AND FOOD SECURITY

BURKINA FASO
THE PROJECT
FOR THE FORMULATION
OF MASTER PLAN
FOR THE MARKET ORIENTED
AGRICULTURE
IN
BURKINA FASO
FINAL REPORT

JULY 2015
JAPAN INTERNATIONAL COOPERATION AGENCY
NTC INTERNATIONAL CO., LTD.
OVERSEAS MERCHANDISE INSPECTION CO., LTD.

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Final Report

Summary

1. Introduction

This is a summary of the final report of the project for the formulation of master plan for the market oriented agriculture in Burkina Faso that consists of 11 chapters. Features on the composition of this report are 2 points. One is that formulation process of the promotion plan of agricultural products (M/P) and the development approaches for the promotion of agricultural products are described in chapter 4 and 5, respectively. It is considered to formulate promotion plans efficiently for other agricultural products that are not target agricultural products in the Project. Another one is that the chapters from 6 to 9 are model plans and the chapters are promotion plans of the agricultural products. Therefore, the plans can be implemented separately or together.

2. Background of the Project

Since the export of gold has increased from 2009, Burkina Faso depends on two export products, namely gold and cotton in value terms. In fact, these two products occupy 63% and 19% of the export value, respectively (Annual Statistics of the Government, 2013). Issues for the sustainable economic growth are to improve industrial structure such as monoculture, increase export value and decrease import value. In the agriculture sector, it is essential to promote diversification of agricultural products and increase the value of crops in order to solve the issues since food crops and cotton combined cover about 84% of the cropping area (Annual Statistics of the Government, 2013).

The government of Burkina Faso formulated “National Program of Rural Sector (PNSR, 2011-2015)” to implement the strategy related to the agriculture sector in “Strategy of Accelerated Growth and Sustainable Development (SCADD, 2011-2015)”. PNSR is a sector program covering rural sector. In the strategy for income improvement of rural people in PNSR, importance is placed on promotion of agricultural products and development of agricultural industries targeting at the international, sub-regional and domestic markets.

Burkina Faso, in which agriculture is a basic industry, has potential for further economical growth by promoting distribution of more agricultural products to international, sub-regional and domestic markets. To promote distribution of agricultural products to outside and inside the country, activation of activities of private sector is essential.

Based on this background, the Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARHASA) would carry out the current Project (PAPAOM) for the formulation of the master plan (M/P), which is consistent with PNSR, for the promotion of the market oriented agriculture technically and financially supported by the Japan International Cooperation Agency (JICA). MARHASA appointed the General Directorate of the Promotion of Rural Economy (DGPER) as a counterpart organization.

3. Formulation Process of the Promotion Plan

(1) Survey and Analysis

To formulate the promotion plan, basic survey, preliminary value chain survey, value chain analysis, macro-analysis of export agricultural products of Burkina Faso and markets of export destinations were conducted.

In the basic survey, basic information and data regarding agriculture sector, related industries, systems, policies, related projects, markets, etc. were collected to understand and analyze present situation. In addition, sector-wide information such as cooperative system, export and import system and structure, quality standards, etc. were collected.

Furthermore, selection of target agricultural products, preliminary value chain survey and value chain analysis were conducted. Through these activities, detailed present situation of four target agricultural products were understood and analyzed. And then promotion issues and promotion measures were examined.

In the macro-analysis of export agricultural products of Burkina Faso and markets of export destination, trends of export agricultural products of Burkina Faso and export destinations were analyzed. Moreover, characteristics of international, sub-regional and domestic markets, which would be export destinations, were analyzed.

(2) Selection of the Target Agricultural Products

The four agricultural products selected as target agricultural products are mango (fruit), strawberry (fruit), onion (vegetable) and soybean (processing material). Except soybean, they are horticultural crops. Although major target markets of the horticultural crops are niche markets, it is said that the profitability is better than that of material-supply type crops (cotton, coffee, tea, soybean, etc.). On the other hand, soybean is a material-supply type export crop. However, Burkina's soybean is for the domestic market. It can be used as processing materials in the country, thus it contributes to promotion of industries of feed processing, livestock and small scale food processing.

(3) Composition of the Promotion Plan for Agricultural Products (M/P)

The promotion plan for agricultural products consists of promotion approaches for each target market and each promotion plan for four target agricultural products. The promotion plan for agricultural products was formulated based on results of the above surveys and analyses.

The promotion approaches for each target market were formulated based on the characteristics of the target markets (international, sub-regional and domestic markets) analyzed from results of the basic survey and preliminary value chain survey.

The each promotion plan for the target agricultural products is a plan to realize promotion measures of the agricultural products examined based on the value chain analyses. In the each promotion plan, target duration, target area and vision were set as a framework. Furthermore, several promotion strategies were set and programs to realize the promotion strategies were planned. Under the programs, several actions were planned as projects. In the each projects, objective, target area, stakeholders/target group, contents of activities, actors, responsible organizations and schedule were planned.

4. Development Approaches

(1) Promotion of Market Oriented Agriculture

Agriculture should be market oriented for the small scale family farming and agribusiness companies to strengthen their competitiveness.

Therefore, roles and issues of producers, processors, exporters in the chains of the four target agricultural products were clarified through value chain analysis. And then, the promotion plans were formulated based on the concept of market oriented agriculture shown in the figure below.

“The market oriented agriculture” in this Project is to produce and sell crops and processed products meeting needs of targeted markets as a business. Therefore, qualities and characteristics of one

agricultural product vary by different target markets, countries and consumers since there are different needs for a crop among them. Furthermore, finding or targeting markets and understanding the market needs should be the starting point since sales or export quantity may not increase despite the productivity improvement. Basically, this point is same in international, sub-regional and domestic market.



Fig. 1 Concept of the Market Oriented Agriculture

(2) Value Chain Approach

In the approach applied in this Project, target crops and markets were set at first. Stages and actors in the value chains to be intervened and improved were clarified in order to respond needs for the markets and increase in the value of Burkina’s products. Generally, value chain development has several measures such as improvement of a bottleneck or improvement of the whole value chain. It varies by target agricultural products and processed products.

5. Promotion Plan for Agricultural Products (M/P)

Objectives of the promotion plan for agricultural products are promotion of diversification of market oriented agricultural products and promotion of domestic agricultural products in order to compete with imported products. The promotion plan for agricultural products consists of promotion approaches for each target market and each promotion plans for the four target agricultural products. (Refer to main report for the promotion approaches for each target market.)

The promotion plans for the target four agricultural products are the followings.

- (1) Model for International Market: Promotion Plan for Mango
- (2) Model for Sub-regional Market: Promotion Plan for Strawberry
- (3) Model for Domestic Market: Promotion Plan for Onion
- (4) Model for Domestic Market: Promotion Plan for Soybean

(3) Model for International Market: Mango Promotion Plan

1) Outline

Export trade chains of mango are chains for fresh mango and dried mango. This promotion plan aims at expanding export of fresh mango and dried mango to international market. Therefore, finding market channels by supporting private sector, increasing production of mango for export,

developing packing capacity are promoted for fresh mango. Improving hygiene of processing units, finding market channels, improving product quality, reducing production cost and improving processing capacity are promoted for dried mango.

2) Program and Project

This promotion plan consists of four programs and five projects as shown in the table below.

		Program	Project
Promotion Plan for Mango	Fresh	1. Expansion of Sales Outlet	1. Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries
			2. Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports
	Dried	2. Improvement of Hygiene	3. Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs
		3. Improvement of Product Quality and Profitability	4. Development and Dissemination of Technology for ATESTA Dryer Modification
		4. Enhancement of Production Capacity	5. Introduction of Smaller Size Dryers

3) Target Duration

Five Years

4) Target Area

Mainly, Cascades Region and Hauts-Bassins Region

5) Estimated Project Cost

987 million FCFA

(4) Model for Sub-regional Market: Strawberry

1) Outline

Trade chains of strawberry for sub-regional market are for local market and supermarket (high class market). This promotion plan aims at increasing export quantity to sub-regional market by meeting needs mainly for high class market. Therefore, finding market channels by strengthening marketing capacities of producers and commercializing with added value, and preserving and expanding production by selection of adaptable varieties and so on are promoted.

2) Program and Project

This promotion plan consists of two programs and five projects as shown the table below.

	Program	Project
Promotion Plan for Strawberry	1. Prospecting New Markets	1. Strengthening Marketing Capacities for Sub-regional Markets
		2. Commercialization with Added Value by Producers to the Domestic Market
	2. Preservation and Expansion of Cultivation	3. Selection of the Adaptable Varieties
		4. Introduction of the Forcing Culture
		5. Strengthening the Secondly Production Area

3) Target Duration

Five Year

4) Target Area

Ouagadougou and Bobo-Dioulasso

5) Estimated Project Cost

67 million FCFA

(5) Model for Domestic Market: Promotion Plan for Onion

1) Outline

Domestic trade chains of onion are for domestic dry season onion and imported rainy season onion. One of aims of this promotion plan is that domestic onions replace the imported onions. This promotion plan aims at increasing sales quantity of domestic onions to domestic market from July to November in which sales quantity of the domestic onions decrease. Therefore, extension of rainy season onion cultivation using varieties for rainy season and improvement of storage capacity for dry season onion by support for establishment of onion storehouses and extension of storage techniques are promoted.

2) Program and Project

This promotion plan consists of two programs and four projects as shown in the table below.

	Program	Project
Promotion Plan for Onion	1. Sales of Onions in the Off-season by the Cultivation of Rainy Season Onions	1. Improvement of the Cultivation Techniques for the Rainy Season Onions
		2. Extension of the Rainy Season Onion Cultivation
	2. Sales of Onions in the Off-season by the Storage of Dry Season Onions	3. Support for Establishment of the Onion Storehouses
		4. Extension of the Onion Storage Techniques

3) Target Duration

Five Years

4) Target Area

Boucle du Mouhoun region, Nord region, Centre-Nord region, Centre-Ouest region, Centre region, Plateau Central region, Hauts Bassins region and Centre-Est region

5) Estimated Project Cost

3,883 million FCFA

(6) Model for Domestic Market: Promotion Plan for Soybean

1) Outline

Domestic trade chains of soybean are 2 chains; feed processing and food processing. Volume of the food processing is little. This promotion plan aims at increasing soybean production volume and promoting smooth distribution to meet increasing domestic soybean demand mainly for feed material. Therefore, increase of distribution volume of the domestic soybeans in the domestic market by promoting information exchange among producers, collectors, etc., promotion of small scale soybean food processing and promotion of organization and cooperation of soybean filière are promoted.

2) Program and Project

This promotion plan consists of three programs and five projects as shown in the table below.

	Program	Project
Promotion Plan for Soybean	1. Increase of Supply Volume in the Domestic Market	1. Increase of Supply Volume in the Domestic Market
	2. Expansion of Tofu related Food Processing Business	2. Sensitization of Soybean-processed Food
		3. Improvement of Knowledge and Techniques on Tofu related Food Processing
	3. Support of Organizing Soybean Filière	4. Strengthening of Capacity and Function of the Soybean Core Group
		5. Promotion of Organization and Cooperation of Filière Stakeholders

3) Target Duration

Five years

4) Target Area

Est region, Centre-Est region, Centre-Ouest region, Centre-Sud region, Hauts-Bassins region, Sud-Ouest region, Cascades region and Centre region

5) Estimated Project Cost

1,502 million FCFA

6. Recommendation

(1) Promotion of Market Oriented Agriculture

In this Project, “market oriented agriculture” was applied as a development approach. The approach is that agricultural products and processed products meeting needs of target markets are produced and sold since agriculture is business. Continuous support is important that small scale producers can practice the market oriented agriculture in value chains since the small scale producers support the Burkina’s agriculture.

(2) New Establishment of Market Oriented Agriculture Promotion Section

Agriculture should be market oriented for small scale producers and agriculture related companies to be highly competitive. Therefore, to promote the promotion plan smoothly, “market oriented agriculture promotion section” is established in DGPER of MARHASA and “project implementation unit” is newly established in the section to implement the promotion plan.

(3) Consideration to Point of View of Industrial Development

Since soybeans in agricultural products can be variously used such as feed, processing/nutrient food, oil etc., various value chains regarding soybeans are formulated. Therefore, soybeans can contribute to promotion of the related industries such as feed processing, livestock, oil refining, small scale processing by women, etc. Soybeans value chain development should be promoted by the Government with positioning the soybeans as a strategic crop of industrial development.

(4) Consideration on the Sub-regional Market Where Economic Growth is Expected

In the sub-regional countries including Burkina Faso (ECOWAS), it is expected that markets of agricultural products and value added foods will grow well in future with population increase, urbanization, increase of the middle class and improvement of income. Although tariff is exempted among the ECOWAS countries in principle, the consumption structures in each country should be considered well.

(5) Consideration on Niche Market

To date, cotton export has contributed to economic growth in Burkina Faso. Diversification of agricultural products following the cotton is essential for further economic growth of Burkina Faso.

Under such situation, consumption structures start changing in matured markets and raising country markets in the international market and in the sub-regional market. Formulation of various niche markets has been started in such markets. In future, it is important to find many various niche markets.

**THE PROJECT FOR THE FORMULATION OF MASTER PLAN
FOR THE MARKET ORIENTED AGRICULTURE**

**IN
BURKINA FASO**

FINAL REPORT

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Summary

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Attachment

1. Breakdown of Project Cost of Promotion Plan
2. Minutes of Meeting of the Joint Coordination Committee

List of Abbreviations

ABNORM	Agence Burkinabé des Norms, de la Métrologie et de la Qualité	Burkina Agency of Standards, Metrology and Quality
ACI	Association de Crédit Intermédiaire	Association de Crédit Intermédiaire
ACP	Pays d'Afrique, Caraïbes et Pacifique	Africa, the Caribbean and the Pacific countries
AEFOB	Association des Exportateurs de la Filière Oignon du Burkina	Association des Exportateurs de la Filière Oignon du Burkina
AFD	Agence Française de Développement	French Development Agency
AfDB	Banque Africaine de Développement	African Development Bank
AGOA	African Growth and Opportunity Act	African Growth and Opportunity Act
ANPI	Agence Nationale de Promotion des Investissements	National Investment Promotion Agency
A/P	Plan d'Action	Action Plan
APCEN-B	Association Professionnelle des Commerçants et Exportateurs de Nibie du Burkina	Association Professionnelle des Commerçants et Exportateurs de Nibie du Burkina
APCOB	Association Professionnelle des Commerçants d'Oignons du Burkina	Association Professionnelle des Commerçants d'Oignons du Burkina
APEMAB	Association Professionnels des Exportateurs de la Mangué du Burkina	Association Professionnels des Exportateurs de la Mangué du Burkina
APEX	Agence pour la Promotion des Exportations du Burkina Faso	Directorate of export promotion
API	Agence pour la Promotion des Investissements du Burkina Faso	Agency for the Promotion of Foreign Investment
APME2A	Agence pour la promotion des petites et moyennes entreprises, Agriculture et Artisanat	Agence pour la promotion des petites et moyennes entreprises, Agriculture et Artisanat
APRICES	Association Professionnelle Interregionale des Commerçants et Exportateurs de Sesame du Burkina	Association Professionnelle Interregionale des Commerçants et Exportateurs de Sesame du Burkina
APROMAB	Association Professionnelle Mangué du Burkina	Association Professionnelle Mangué du Burkina
ARPSB	Association Regionale des Professionnels du Sesame du Burkina	Association Regionale des Professionnels du Sesame du Burkina
ASAN	Association les Amis de la Nature	Association les Amis de la Nature
ASE	Autorisation Spéciale d'Exportation	Special Authorization to Export
ASK	Association Song Koaadba	Song Koaadba Association
ATP (EATP)	Agribusiness and Trade Promotion (ATP) and Expanded Agribusiness and Trade Promotion (EATP)	Agribusiness and Trade Promotion (ATP) and Expanded Agribusiness and Trade Promotion (EATP)
ATTRAB/B	Association pour le Transfert de Technologie Agricole dans le Boulgou	Association pour le Transfert de Technologie Agricole dans le Boulgou
BCEAO	Banque Centrale des États de l'Afrique de l'Ouest	Central Bank of West African Countries
BKB	Breizh Kengred Burkina	Breizh Kengred Burkina
CBC	Conseil Burkinabé des Chargeurs	Burkina Loaders Council
CCI	Chambre de Commerce, d'industrie et d'Artisanat du Burkina Faso	Chamber of Commerce and Industry
CDS	Cercle des Sécheurs	Cercle des Sécheurs
CEAS	Centre Ecologique Albert SCHWEITZER	Centre Ecologique Albert SCHWEITZER
CEDEAO	Communauté Économique des États de l'Afrique de l'Ouest	Economic Community of West African States
CEFORE	Centre de Formalités des Entreprises	Business Single Window

CET	Tarif Extérieur Commun	Common External Tariff
CFA	Centres Financiers aux Agriculteurs	Centres Financiers aux Agriculteurs
CFC	Crédit du Fonds pour le Commerce	female trade credit
CFE	Centre Financier aux Entrepreneurs	Centre Financier aux Entrepreneurs
CFO	Cotisation Forcée Obligatoire	Fund and obligatory contributions
CIC-B	Comité Interprofessionnel des Céréales du Burkina	Comité Interprofessionnel des Céréales du Burkina
CIF	Centre d'Innovation Financière	Centre d'Innovation Financière
CIF	Confédération des Institutions Financières	Confédération des Institutions Financières
CIFOB	Comité Interprofessionnel de la Filière Oignon du Burkina	Comité Interprofessionnel de la Filière Oignon du Burkina
CIR-B	Comité Interprofessionnel du Riz du Burkina	Comité Interprofessionnel du Riz du Burkina
CNA	Chambre Nationale d'Agriculture	National Chamber for Agriculture
CNC	Certificat National de Conformité	National Conformity Certificate
CNRSP	Centre National de la Recherche Scientifique et Technologique	National Center for Scientific and Technologic Research
CP	Caisses Populaires	Caisses Populaires
CPF	Confédération Paysanne du Faso	Confédération Paysanne du Faso
CPI	Conseil Présidentiel Pour l'Investment	Presidential Council for Investment
CPR	Centre de Promotion Rurale	Rural Promotion Centers
CRA	Chambre Régionale d'Agriculture	Regional Chamber for Agriculture
CREAF	Centre de Recherches Environnementls, Agricoles et de Formation	Center of Environmental, Agricultural Research and Training
CREDO	Organisation Chrétienne de Secours et de Développement	Organisation Chrétienne de Secours et de Développement
CRREA	Centre Regional de Recherches Environnementales et Agricoles	Regional Centers of Environmental and Agricultural Research
CRS	Catholic Relief Services	Catholic Relief Services
CSS	Certificat de Sécurité Sanitaire	Sanitary Control Certificate
CV	Caisse Villageoise	Caisse Villageoise
CVECA	Caisses Villageoises d'Epargne et de Crédit Autogérées	Autonomous Village Bank for Saving and Credit
DCP	Document Cadre de Partenariat	Partnership framework document
DDEA	Direction du Développement des l'Entreprenariat Agricole	Directorate of Development of Agricultural Business
DDMPA	Direction du Développement des Marchés des Produits Agricoles	Directorate of Development of the Markets of Agricultural Products
DGADI	Direction Générale des Aménagements Agricoles et du Développement de l'Irrigation	General Directorate of Agricultural Facilities and Development of Irrigation
DGCE	Direction Générale du Commerce Extérieur	General Directorate of Foreign Trade
DGCI	Direction Générale du Commerce Intérieur	General Directorate of Internal Commerce
DGESS	Direction Générale des Études et des Statistiques Sectorielles	General Directorate of Study, Planning and Statistics
DGFOMR	Direction Générale du Foncier, de la Formation et de l'Organisation du Monde Rural	General Directorate of Landholding, Training and Organization of Rural Society
DGI	Direction Générale de l'Industrie	General Directorate of Industry
DGPER	Direction Générale de la Promotion de l'Economie Rurale	General Directorate of the Promotion of Rural Economy
DGPV	Direction Générale des Productions Végétales	General Directorate of Plant Production

DGQM	Direction Générale de la Qualité et de la Métrologie	General Directorate of Quality and Metrology
DOPAIR	Direction de l'Organisation des Producteurs et de l'Appui aux Institutions Rurales	General Directorate of Producers' Organization and of Support to Rural Institutions
DPARHASA	Direction Provinciale de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire	Provincial Directorate of Agriculture, Water Resources, Sanitation and Food Security
DPEFA	Direction de veille et de la Promotion Économique des Filières Agricoles	Directorate of Economic Promotion of Agricultural Value Chain
DPSAA	Direction de la Prospective et des Statistiques Agricole et Alimentaire	
DPVC	Direction de la Protection des Végétaux et du Conditionnement	Directorate of Plant Protection and Packaging
DRARHASA	Direction Régionale de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire	Regional Directorate of Agriculture, Water Resources, Sanitation and Food Security
DTAN	Direction de la Transformation, de l'Alimentation, de la Promotion des Normes et de la Qualité Nutritionnelle des Produits Agricoles	Directorate of Processing, Food, Promotion of Standards and Nutritional Quality of Agricultural Products
DVRD	Direction de la Vulgarisation et de la Recherche-Développement	Directorate of Extension and Research and Development (MARHASA)
EBA	Everything but Arms	Everything but Arms
ECOWAS	Communauté Économique des États de l'Afrique de l'Ouest	Economic Community of West African States
EDF	Fonds européen de développement	European Development Fund
EPA	Accords de Partenariat Économique	Economic Partnership Agreement
ESOP	Enterprise de Service et Organisation des Paysans	Enterprise de Service et Organisation des Paysans
ETLS	Schéma de Libéralisation des Echanges de la CEDEAO	ECOWAS Trade Liberalization Scheme
EU	Union Européenne	European Union
FAARF	Fonds d'Appui aux activités Rémunératrices des Femmes	Support Fund for Women Income Generating Activities
FAO	Organisation des Nations unies pour l'alimentation et l'agriculture	Food and Agriculture Organization
FASONORM	Organisme National de Normalisation du Burkina Faso	National Organization of Standardization of Burkina Faso
FCPB	Fédération des Caisses Populaires du Burkina	Fédération des Caisses Populaires du Burkina
FEER	Fonds de l'Eau et de l'Équipement Rural	Fund for Water and Rural Equipment
GDP	Produit Intérieur Brut	Gross Domestic Product
GESB	Groupement des Exportateurs de Sesame et Autres Produits Oleagineux du Burkina	Groupement des Exportateurs de Sesame et Autres Produits Oleagineux du Burkina
GIE	Groupement d'Intérêt Économique	Group sharing an economic interest (Moral Person)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNI	Revenu National Brut	Gross National Income
GSP	Système de Préférences Généralisée	Generalized System of Preference
HACCP	Analyse des dangers et points critiques pour leur maîtrise	Hazard analysis and critical control points

ICI	Forum International des Investissements en Côte d'Ivoire	International Forum for Investments in Code d'Ivoire
IFAD	Fonds international de développement agricole	International Funds for Agricultural Development
IITA	International Institute of Tropical Agriculture	International Institute of Tropical Agriculture
INERA	Institut National pour l'Environnement et de la Recherche Agricole	institute of environment and agricultural research
INSD	Institut National de la Statistique et de la Démographie	National Institute of Statistics and Demography
IRSAT	Institut de Recherche en Sciences Appliquées et Technologies	Research Institute of Applied Science and Technology
IRSAT-DTA	Institut de Recherche en Sciences Appliquées et Technologies - Department Technologie Alimente	Research Institute of Applied Science and Technology-Department of Food Technology
ISO	Organisation internationale de normalisation	International Organization for Standardization
ISRT	Transit Routier Inter-Etats	Inter-State Road Transit
JAICAF	Japan Association for International Collaboration of Agriculture and Forestry	Japan Association for International Collaboration of Agriculture and Forestry
JCC	Comité de Pilotage	Joint Coordinating Committee
JETRO	Organisation Japonaise du Commerce Extérieur	Japan External Trade Organization
JICA	Agence Japonaise de Coopération Internationale	Japan International Cooperation Agency
JIRCAS	Japan International Research Center for Agriculture Sciences	Japan International Research Center for Agriculture Sciences
KfW	Kreditanstalt für Wiederaufbau	German Development Bank
KIT	Koninklijk Instituut voor de Tropen	Koninklijk Instituut voor de Tropen
LDP	Pays les Moins Avancés (PMA)	Least Developed Countries
LNSP	Laboratoire National de Santé Publique	National Laboratory of Public Health
MAHR	Ministère de l'Agriculture et de l'Hydraulique	Ministry of Agriculture and Hydraulics
MARHASA	Ministère de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire	Ministry of Agriculture, Water Resources, Sanitation and the Food Security
MCA	Millenium Challenge Account	Millenium Challenge Account
MCC	Millenium Challenge Cooperation	Millenium Challenge Cooperation
MEBF	Maison de l'Entreprise du Burkina Faso	
MFI	Institutions de Micro-Finance	Micro finance institutions
MICA	Ministère de l'Industrie, du Commerce et de l'Artisanat	Ministry of Industry, Commerce and Handicraft
M/P	Schéma Directeur	Master Plan
NGO	Organisation Non Gouvernementale	Non Governmental Organization
NPPO	Organisation Nationale de Protection des Végétaux	National Plant Protection Organization
OECD	Organisation de coopération et de développement économiques	Organization for Economic Co-operation and Development
OHADA	Organisation pour l'harmonisation en Afrique du Droit des Affaires	Organization for the Harmonization of Business Law in Africa
ONAC	Office National du Commerce Extérieur	Directorate of Foreign Trade
PAPAOM	Project d'Appui à l'élaboration d'un schéma directeur pour une Agriculture Orientée vers le Marché	The Project for the Formulation of Master Plan for the Market Oriented Agriculture
P4P	Purchase for Progress	Purchase for Progress

PABSO	Programme d'Aménagement des Bas-fonds dans le Sud-Ouest et la Sissili	Bas-fonds Development Program in Sud-Oest Region and Sissili Province
PADAB II	Programme d'Appui au Développement de l'Agriculture du Burkina Faso Phase 2	Burkina Faso Agricultural Development Support Program Phase II
PAFASP	Programme d'Appui aux Filières Agro-Sylvo-Pastorales	Agriculture, Forestry and Livestock Value Chains Support Program
PAMF	Société Burkinabé de MicroFinance	Société Burkinabé de Micro Finance
PAN	Plan d'Action pour le développement de la filière Niébé	Action Plan for the development of the Niebe Sector
PAPAOM	Project d'Appui à l'élaboration d'un schéma directeur pour une Agriculture Orientée vers le Marché	The Project for the Formulation of Master Plan for the Market Oriented Agriculture in Burkina Faso
PAPSA	Projet d'Amélioration de Productivité et à la Sécurité Alimentaire	Agricultural Productivity and Food Security Project
PCESA	Programme de Croissance Economique dans le Secteur Agricole	Agriculture Sector Economic Growth Program
PDA	Programme Développement de l'Agriculture	Agricultural Development Program
PNSA	Programme Nationale pour la Sécurité Alimentaire	National Program of Food Security
PNSR	Programme National du Secteur Rural	National Programme of Rural Sector
PROFIL	Projet d'appui aux filières agricoles	Agricultural Value Chains Support Project
PRP	Projet Riz Pluvial	Rainfed Rice Project
PSSA	Programme Spécial pour la Sécurité Alimentaire	Special Programme of Food Security
PTRAMAB	Professionnels de la Transformation de la Mangué au Burkina	Professionnels de la Transformation de la Mangué au Burkina
RCPB	Réseau des Caisses Populaires du Burkina	Réseau des Caisses Populaires du Burkina
RCTF	Réseau de Transformatrices des Céréales du Faso	Réseau de Transformatrices des Céréales du Faso
ROSCA	Tontine	Rotating Saving and Credit Arrangements
SA	Société Anonyme	Limited Company
SARL	Société Anonyme à Responsabilité Limitée	Limited Liability Company
SCAC	Service de Coopération et d'Action Culturelle	Office of cooperation and culture activities
SCADD	Stratégie de Croissance Accélérée et de Développement Durable	Strategy of Accelerated Growth and Sustainable Development
SCPQ	Service du Contrôle Phytosanitaire et de la Qualité	Service of Phytosanitary and Quality Control
SDR	Stratégie de Développement Rural	Rural Development Strategy
SE-CNSA	Secrétariat Exécutif du Conseil National de sécurité Alimentaire	Secrétariat Exécutif du Conseil National de sécurité Alimentaire
SGTF Durabilis	Société de Gestion de Terminaux Fruitières Durabilis	Société de Gestion de Terminaux Fruitières Durabilis
SDFA	Stratégie de Développement des Filières Agricoles	Strategy for Agriculture Value Chain Development
SNE	Stratégie Nationale des Exportations	National Strategy of Exports
SNVACA	Système National de Vulgarisation et d'appui Conseil Agricoles	National system of agricultural extension and advisory support
SOFIPE	Société de Financement de la Petite Entreprise	Société de Financement de la Petite Entreprise
SONACEB	Société Nationale de Cartons et d'Emballages du Burkina	Société Nationale de Cartons et d'Emballages du Burkina

SONAGESS	Société Nationale de Gestion du Stock de Sécurité Alimentaire	Société Nationale de Gestion du Stock de Sécurité Alimentaire
SP/CPSA	Secrétariat Permanent de Coordination des Politiques Sectorielles Agricoles	Permanent Office for the Coordination of Rural Sector Policies
SUBEX	Subvention pour le développement du potentiel exportable	Grant for the development of potential exportations
SYLVIE	Système de liaison virtuelle des importations et exportations	Communication system for imports and exports
UAT	Unité d'Animation Technique	Unit of Technical Facilitation
UCOBAM	Union des Cooperatives Agricoles et Maraicheres du Burkina	Union des Cooperatives Agricoles et Maraicheres du Burkina
UDGPM/K	Union Departementale des Groupements des Producteurs des Maraichers de Korsimoro	Union Departementale des Groupements des Producteurs des Maraichers de Korsimoro
UEMOA	Union Economique et Monétaire Ouest Africaine	West African Economic and Monetary Union
UN	Nations-Unies	United Nations
UNAPOB	Union Nationale des Producteurs d'Oignon du Burkina	Union Nationale des Producteurs d'Oignon du Burkina
UNAPROSEB	Union Nationale des Producteurs de Sesame du Burkina	Union Nationale des Producteurs de Sesame du Burkina
UNCTAD	Conférence des Nations unies sur le Commerce et le Développement	United Nations Conference on Trade and Development
UNDP	Programme des Nations unies pour le développement	United Nations Development Programme
UNEXMB	Union Nationale des Exportateurs de Mangues du Burkina	Union Nationale des Exportateurs de Mangues du Burkina
UNPCB	Union Nationale des Producteurs Cotonniers du Burkina Faso	Union Nationale des Producteurs Cotonniers du Burkina Faso
UNPMB	Union Nationale des Producteurs de Mangues du Burkina	Union Nationale des Producteurs de Mangues du Burkina
UPPFL/CO	Union Provinciale des Producteurs de Fruits et Légumes de la Comoé	Union Provinciale des Producteurs de Fruits et Légumes de la Comoé
USAID	United States Agency for International Development	United States Agency for International Development
WAAPP	Programme de productivité Agricole en Afrique de l'Ouest	West Africa Agricultural Productivity Program
WB	Banque Mondiale	World Bank
WFP	Programme Alimentaire Mondial	World Food Programme
WTO	Organisation Mondiale du Commerce (OMC)	World Trade Organization
ZAT	Zone d'Appui Technique	Zone of Technical Support

Scales and Measures

Based on the metric system

Exchange Rates

1EUR = 655.957FCFA = 135.33JPY

1USD = 123.96JPY

Chapter 1 Introduction

1.1 Background of the Project

Burkina Faso is a landlocked country in West Africa, and GNI per capita is 750 USD¹. Agriculture is one of the major sectors, which represents 30% of the GDP² and provides employment with 85% of the working population³. Sorghum, millet, maize and cowpeas are the main food crops, while cotton, peanut and sesame are the main cash crops. These crops are cultivated in extensive agricultural system depending on precipitation.

Since the export of gold has increased from 2009, Burkina Faso depends on two products, namely gold and cotton in value terms. In fact, these two products occupy 63% and 19% of the export amounts respectively⁴. The economy of Burkina Faso has had persistently current account deficit for years since its trade balance is in deficit together with the population growth in recent years. Therefore, priority issues for the sustainable economic growth and sound macro economy are to improve industrial structure such as monoculture, increase export amount and decrease import amount. In the sector, the food crops and cotton combined cover about 84% of the cropping area⁵. Therefore, it is essential to promote diversification of agricultural commodities and increase the value of export crops in order to solve the issues.

The government of Burkina Faso formulated “National Program of Rural Sector (PNSR, 2011-2015)” to implement the strategy related to the agriculture sector in “Strategy of Accelerated Growth and Sustainable Development (SCADD, 2011-2015)”. PNSR is a sector program which covers rural sector. In the strategy for income improvement of rural people of PNSR, its aims are to promote agricultural products and develop agricultural industries targeting at the international, sub-regional and domestic markets.

Based on this background, the Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARHASA) would carry out the current Project (PAPAOM) for the formulation of the master plan (M/P), which is consistent with PNSR, for the promotion of the market oriented agriculture technically and financially supported by the Japan International Cooperation Agency (JICA). MARHASA appointed the General Directorate of the Promotion of Rural Economy (DGPER) as a counterpart organization.

1.2 Objectives of the Project

The objectives of the Project are to formulate both the M/P and action plans (A/P), which contributes to the promotion of export of agricultural products and the reduction of import through value chain analysis and pilot activities. The goal of the M/P and A/P is to improve income of rural people through promoting the diversification of market oriented agricultural products and the production of domestic agricultural products that can compete with imported products.

1.3 Target Area and Target Crops of the Project

The target area of the master plan is the whole areas of Burkina Faso. However, target areas of each target crop are identified based on the selection of potential agricultural products. The potential agricultural products are selected through the first and second selections.

¹ World Bank, 2013

² World Bank

³ International Labour Organization (ILO), 2005. Data in 2005 is the latest in the statistics of ILO.

⁴ INSD, “Annual Statistics, 2013”

⁵ INSD, “Annual Statistics, 2013”

1.4 Implementation Institution

The “task force” set up in DGPER implemented the Project in collaboration with the JICA team.

1.5 Work Flow and Contents of the Project

(1) Work Flow of the Project

The Project consists of two phases of the value chain analysis and the pilot activities. The Project was implemented from March 2013 to May 2015.

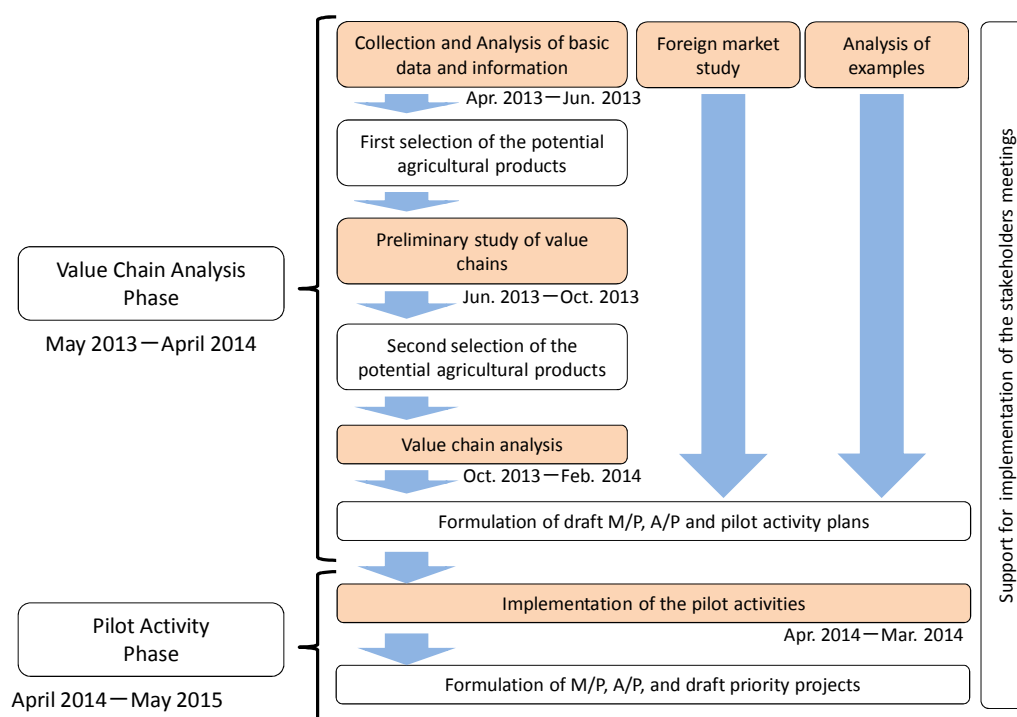


Fig. 1.5.1 Work Flow of the Project

(2) Contents of the Project

The main contents of the Project in each phase are shown below.

Table 1.5.1 Contents of the Project

1 st phase (March 2013 – March 2014)	2 nd phase (April 2014 – May 2015)
1. Data collection in Japan	1. Implementation of the pilot activities
2. Preparation and discussion for the inception report	2. Preparation and distribution of the manual for promotion of agricultural products
3. Preparation and discussion for the work plan	3. Finalization of the A/P
4. Formulation of the technical transfer plan	4. Formulation of the draft priority projects
5. Collection of basic data and information	5. Preparation and discussion for the draft progress report 2
6. First selection of the potential agricultural products	6. Finalization of the M/P
7. Preliminary study of value chains	7. Preparation and explanation for the draft final report
8. Implementation of foreign markets study	8. Preparation of the final report
9. Preparation of the draft progress report 1	
10. Second selection of the potential agricultural products	

11. Implementation of the value chain analysis 12. Analysis of examples of other development partners and private sector 13. Consideration of draft pilot activities 14. Support for implementation of the stakeholders meetings 15. Formulation of the draft M/P (including A/P) 16. Preparation of the interim report	
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1.6 Composition of the Report

This report consists of 11 chapters in total. Features of this report on the composition are 2 points. One is that formulation process of the promotion plan of agricultural products (M/P) and the development approaches for the promotion of agricultural products are described in chapter 4 and 5, respectively. It is considered to formulate promotion plans efficiently for other agricultural products that are not target agricultural products in the Project. Another one is that the chapters from 6 to 9 are model plans and the chapters are promotion plans of the agricultural products. Therefore, each chapter can be separated for the implementation. Outlines of each chapter are shown below.

Table 1.6.1 Outlines of Each Chapter of This Report

	Outline
Chapter 1 Introduction	Background, objectives, target areas, implementation institution, work flow, contents of the Project are described.
Chapter 2 Outline of Economy, National Policy, Agriculture and Export System of Burkina Faso	Economic and industrial structures, national policies, agriculture sector and export system of agricultural products are described.
Chapter 3 Outline of Major Markets of Agricultural Products of Burkina Faso	Major markets of agricultural products of Burkina Faso are divided into international, sub-regional and domestic markets. A general view of the markets is taken by several data.
Chapter 4 Formulation Process of the Promotion Plan of Agricultural Products	Formulation process of the promotion plan of agricultural products proposed in the Project is described. In this chapter, the processes of 1) selection of agricultural products, 2) value chain analysis of the selected agricultural products, 3) pilot activities that includes verification factors regarding the selected agricultural products, etc. are explained.
Chapter 5 Position of the Promotion Plan of Agricultural Products and Development Approaches	Position of the promotion plan of agricultural products is clarified and development approaches that are points of view to promote the promotion plan.
Chapter 6 Model for International Market: Mango	Promotion plan of mango is described as a promotion model of agricultural products for international market. This chapter consists of analysis of present situation of mango sector, promotion issues, pilot activity, promotion plan, project cost, recommendations, etc.
Chapter 7 Model for Sub-regional Market: Strawberry	Promotion plan of strawberry is described as a promotion model of agricultural products for sub-regional (including domestic market). Composition of this chapter is same as that of the chapter 6.
Chapter 8 Model for Domestic Market: Onion	Promotion plan of onion is described as a promotion model of agricultural products for domestic market (including sub-regional market). Composition of this chapter is same as that of the chapter 6.
Chapter 9 Model for Domestic Market: Soybeans	Promotion plan of soybeans is described as a promotion model of agricultural products for domestic market (including sub-regional market). Composition of this chapter is same as that of the chapter 6.
Chapter 10 Implementation Structure	Implementation structure for the whole promotion plan is described.
Chapter 11 Recommendations	Recommendations regarding the whole promotion plan are described.

Chapter 2 Outline of Economy, National Policies, Agriculture and Export System of Burkina Faso

2.1 Socioeconomic and Industrial Structure

(1) Natural Conditions

Burkina Faso is surrounded by Mali, Niger, Benin, Togo, Ghana and Cote d'Ivoire and a landlocked country in West Africa which total area is 274,200km² (about 70% of Japan's territory). Average altitude is about 400 m and the lands are relatively flat in general (the altitude varies from 125m to 749m). However, the climate is well diversified. As for annual precipitation, for example, the northern Sahel area has 300mm but the South West area has 1200mm. Therefore, it makes various agricultural production possible based on the local conditions. The rainy season period is from May to October¹.

(2) Society/Culture

Population of Burkina Faso has increased (the annual increase rate over the past 10 years was about 3%). The total population was 16.46 million people in 2012 (the population density was about 60 people per km²)². Burkina Faso is a multiracial country which has 60 ethnic groups. The ethnic groups are Mossis, Gourmantchés, Yarses, Gourounsis, Bobos, etc. The proportion of population by religion is the traditional religion (40 – 55 %), Moslems (30 – 40 %) and Christians (15 – 20 %)³.

(3) Macro Economy and Industrial Structure

The following figures show the change in GDP (the real value based on the prices in 1999) of Burkina Faso by sector from 1970 to 2007. During this period of about 40 years, Burkina Faso achieved about 4 times economic growth at national level and doubled GDP per capita. Even though many sub-Saharan African countries maintain relatively high economic growth rate, the economic growth of Burkina Faso is considerable especially since the end of 1990s. The yearly average rate of economic growth over the past 10 years was 5.7%.

It is noticeable that all sectors (from primary to tertiary sector) equally had the economic growth in Burkina Faso. Generally, agriculture trends to shrink more in comparison with the other sectors when the economy grows. However, agriculture remains the main sector in the 2000s, and it occupies about 30% of the national GDP in Burkina Faso.

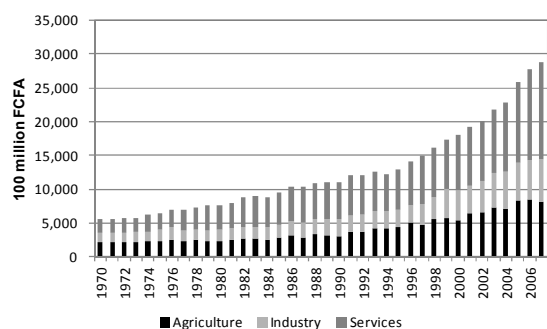


Fig. 2.1.1 Breakdown of GDP by Sector (constant value in 1999 base)

Source: Development Indicators of World Bank (Since the breakdowns have not been published since 2005, the values have been calculated based on data of table 8.1 in "Les comptes économiques de la nation 1999 à 2007: Comptes définitifs" of INSD (2010))

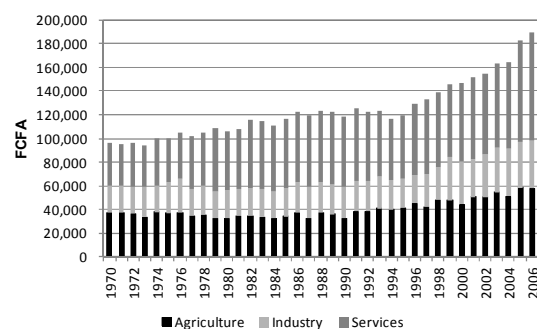


Fig. 2.1.2 Breakdown of GDP per Capita by Sector (constant value in 1999 base)

Source: Same as the one at left

¹ JICA, "Report of data collection survey on agriculture sector in Burkina Faso, 2012"

² World Bank

³ JAICAF, "Agriculture and Forestry in Burkina Faso, 2013"

(4) Import/Export Structure and Agricultural Products

The following figures show changes in the GDP calculated from four categories of expenditures (consumption, investment, governmental expenditures, and net exports) from 1999 to 2007. Burkina Faso experienced trade deficits during this period because of the small amounts of export (8% of the GDP, average from 1999 to 2007) and the large amounts of import (23%).

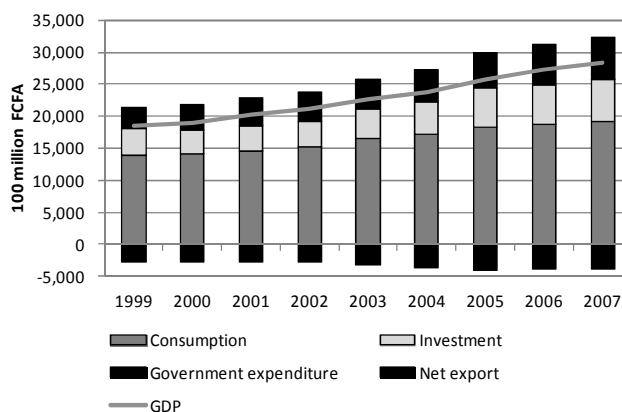


Fig. 2.1.3 GDP Calculated from Expenditures (constant value in 1999 base)

Source: Made from the data of table 4.1 in “Les comptes économiques de la nation 1999 à 2007: Comptes définitifs”, INSD (2010)

1) Import Value

The following figures show change of total import amount and import amount of agricultural products⁴. Since 2001 in Burkina Faso, the import such as industrial materials is increasing with increase of the population. However the import amount of agricultural products tends to increase, the rate of this is lower than the rate of total import amount. Therefore, the percentage of agricultural products as a portion of total import amount decreases from 15% to 7%.

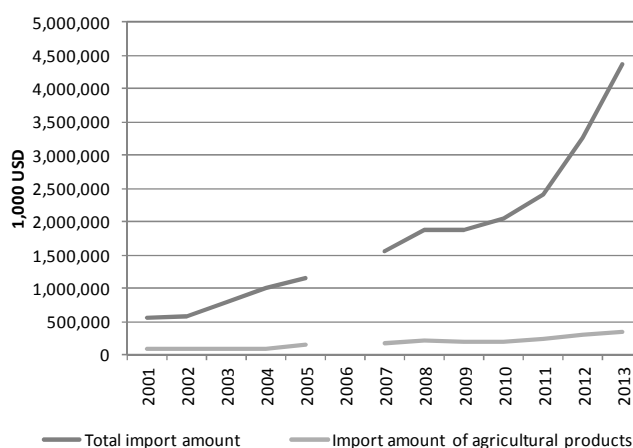


Fig. 2.1.4 Change of Import Amount of Burkina Faso

Source: Trade Map

The following tables show import amount of agricultural products and major import agricultural products. In case of import values of agriculture products, rice, which percentage of self-sufficiency

⁴ The agricultural products are the following HS codes in this chapter, HS07 (Edible vegetables and certain roots and tubers), HS08 (Edible fruit, nuts, peel of citrus fruit, melons), HS09 (Coffee, tea, mate and spices), HS10 (Cereals), HS11 (Milling products, malt, starches, inulin, wheat gluten), HS12 (Oil seed, oleagious fruits, grain, seed, fruit, etc, nes), HS15 (Animal, vegetable fats and oils, cleavage products, etc.), HS17 (Sugars and sugar confectionery), HS20 (Vegetable, fruit, nut, etc. food preparations), HS52 (Cotton).

is low, 40%, and which consumption quantity is rapidly increasing especially in urban areas in recent years, is the largest. Its percentage occupies about 40% of the total. Therefore, the government considers replacing the imported rice with domestic rice. Following the rice, wheat, flour for bread and sugar are imported much. The total percentage of four accommodations occupies about 70% of the total import amount of agricultural products.

Table 2.1.1 Change of Import Amount of Major Agricultural Products in Burkina Faso

[Unit: 1,000USD]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agricultural Products	82,981	85,510	90,885	93,879	141,504		173,891	206,665	184,175	187,633	246,307	293,445	335,030
	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rice	34,791	36,164	34,369	46,794	69,493		69,325	90,891	69,570	63,697	92,847	116,610	125,393
	41.9%	42.3%	37.8%	49.8%	49.1%		39.9%	44.0%	37.8%	33.9%	37.7%	39.7%	37.4%
Wheat	4,149	3,340	3,339	2,356	2,813		21,355	33,035	24,718	19,944	28,604	27,606	34,596
	5.0%	3.9%	3.7%	2.5%	2.0%		12.3%	16.0%	13.4%	10.6%	11.6%	9.4%	10.3%
Flour	5,117	5,373	10,743	6,895	13,896		7,879	6,321	11,656	18,106	17,489	24,224	19,806
	6.2%	6.3%	11.8%	7.3%	9.8%		4.5%	3.1%	6.3%	9.6%	7.1%	8.3%	5.9%
Sugar	12,043	14,825	14,880	6,612	13,636		18,747	11,862	17,436	24,286	36,239	35,562	51,756
	14.5%	17.3%	16.4%	7.0%	9.6%		10.8%	5.7%	9.5%	12.9%	14.7%	12.1%	15.4%

Source: Trade Map

2) Export Value

As following figures show, the main export produces are gold and cotton which occupy about 90% of total export amounts. Although the amounts of gold export was rapidly increased since 2007 and reached about 77% of the total export amount in 2011, the trade balance is still in deficit. On the other hand, agricultural products occupied more than 70% of the export amount before 2007. However, it was decreased to about 20% in 2011 because of the decrease of the international price. Since 2012, the export amount of gold tends to decrease, conversely, the export amount of agricultural products inclines to increase. However, the foreign trade of Burkina Faso depends on two products while increasing of the import amount and the trade deficit are kept for many years.

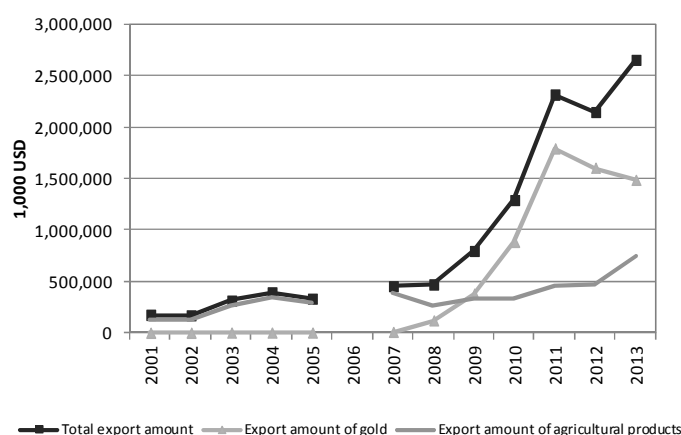


Fig. 2.1.5 Change of Export Amount of Burkina Faso

Source: Trade Map

As following tables show, Export amount of cotton occupies above 60% of total export amount of agricultural products. Therefore, Burkina Faso needs to diversify the export products and increase the export amount with referring lessons learned from the success of cotton. Export amounts of agricultural products such as sesame and cashew nut have been increased since 2007, changes to diversify the export products and to increase export amount have been started. However, percentage of agricultural products of Burkina Faso that are traded in markets is still little in general.

Only 6 to 9% of cereals produced and 40% of cash crops have been treated in domestic market or exported in 2010 (PNSR, the strategic axis 2, background). It means that Burkina Faso, in which agriculture is still one of the main sectors, has potential of economic growth and improvement of the trade balance through promoting distribution of the products to domestic, sub-regional and international markets (PNSR aims at increasing the share of cereal and cash crops trading in markets to 20% and 80% of the production quantity respectively.)

Table 2.1.2 Change of Export Amount of Major Agricultural Products in Burkina Faso

[Unit: 1,000USD]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agricultural products	132,279	130,872	264,814	349,971	288,877		387,640	268,622	333,174	336,459	451,035	475,404	751,715
	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cotton	109,542	109,142	228,421	296,401	248,985		304,383	198,809	252,079	228,143	272,929	304,883	454,671
	82.8%	83.4%	86.3%	84.7%	86.2%		78.5%	74.0%	75.7%	67.8%	60.5%	64.1%	60.5%
Sesame	6,232	6,592	7,874	11,805	9,595		21,059	24,638	47,650	55,920	56,644	90,529	161,306
	4.7%	5.0%	3.0%	3.4%	3.3%		5.4%	9.2%	14.3%	16.6%	12.6%	19.0%	21.5%
Cashew nut	732	286	2,308	1,269	1,135		1,068	3,171	2,683	7,733	61,627	33,450	52,163
	0.6%	0.2%	0.9%	0.4%	0.4%		0.3%	1.2%	0.8%	2.3%	13.7%	7.0%	6.9%

Source: Trade Map

(5) Role of Agriculture in Industry

As mentioned previously, agriculture occupies about 30% of GDP of Burkina Faso. Furthermore, it provides employment to about 85% of the working population⁵ and contributes to about 45% of household income⁶. Therefore, the agriculture is a key industry of the country. On the other hand, the industry and services accounts for 3% and 12% of working population, respectively⁷.

Although rainfed extensive agriculture is major in Burkina Faso, the cultivation is also practiced in rainfed lowland or irrigated farmland. Potential areas of lowland and irrigated farmland are about 500,000 ha and 230,000 ha respectively. Out of them, about 90% is not developed yet⁸. Out of the cultivated area, cereals such as sorghum, millet and maize, etc. and food crops such as cowpea, etc. occupy 79% and cash crops such as cotton, sesame and peanut etc. occupy 19%. The self-sufficiency rate of the main cereals except rice and wheat are nearly 100%.

Most of producers grow cash crops that are suitable for local conditions or raise livestock in addition to growing the food crops. Cultivated area per producer was 0.85 ha in 2008. In spite of the existence of a law related to land rights, traditional systems for land holding and renting still remain in rural areas.

(6) Poverty and Food Security

In spite of the economic growth, GNI per capita was still low, at 750 USD in 2013⁹, and 43.9% of the population was living below the poverty line in 2009. Especially, more than half of the population was living below the poverty line in rural area.

⁵ International Labour Organization, 2005

⁶ JICA, "Data collection survey on agriculture sector in Burkina Faso, 2012"

⁷ International Labour Organization, 2005

⁸ JICA, "Data collection survey on agriculture sector in Burkina Faso, 2012"

⁹ World Bank

Table 2.1.3 Change of Poverty Rate*

[Unit: %]

	1994	1998	2003	2009
Rural area	51.0	51.0	52.3	50.7
Urban area	10.4	16.5	19.9	19.9
Whole country	44.5	45.3	46.3	43.9

*: The poverty rate shows the population rate below the income poverty line. The income poverty line sets in every annual.
Source: SCADD (2010)

Food security is an important issue in the government policy of Burkina Faso as mentioning "the strategic axis 1: Improvement of food security and food self-sufficiency" in PNSR. Although the main objective of the Project is to improve value chains of the export agricultural products, it is also necessary to consider improving the food security. For example, it is necessary to consider sustainable land use harmonized with food crop cultivation when cash crops are promoted.

2.2 National Policies

(1) Strategy for Accelerated Growth and Sustainable Development (SCADD) and National Program for Rural Sector (PNSR)

The government of Burkina Faso has formulated "Strategy for Accelerated Growth and Sustainable Development (SCADD, 2011-2015)" in 2011. In the strategy, the government focused on the economic growth more than previous development plans and aimed to achieve 10 % of average annual growth rates in the period covered. Furthermore, the agricultural/rural development sector is considered as a priority sector for accelerated growth in this strategy. The government aims at reaching 10.7 % of average annual growth rate of primary sector.

"National Program for Rural Sector (PNSR, 2011-2015)", which is the document for implementing the strategy for rural sector in the SCADD, is positioned at the top-level program in agricultural and rural development sector. The PNSR is a sector-based and comprehensive program for the agricultural sector. It has strategic axes such as income improvement of rural people and aims at promoting agricultural products for international, sub-regional (West Africa) and domestic markets and raising agriculture industries.

That means, the acceleration of the economic growth is one of the strategies in the SCADD and the agricultural sector is positioned as one of priority development sectors. In addition, the income improvement of rural people is considered as one of the strategies (the strategic axis 2) in the PNSR that is an implementation plan for the agricultural and rural sector. It is expected that the Master Plan in the Project should be a document under the strategic axis 2 in the PNSR. Therefore, the M/P should be consistent with the strategic axis 2 in the PNSR and can be approved as a political document by the government of Burkina Faso.

(2) National Strategy of Exports (SNE)

The government of Burkina Faso formulated the National Strategy for Promotion of Exports (SNE) in 2010 under initiative of the General Directorate of Foreign Trade (DGCE) of the Ministry of Industry, Commerce and Handicraft. This strategy aims at increasing exports and determines the concrete development goals and directions to improve 5 value chains; mango, onion, sesame, sheanut and livestock. Although other agricultural products such as tomato, ginger, soybeans and cashew nut have exports potentials in the future, details for these products are not mentioned in this strategy since the potentials are not so certain in comparison with the former 5 products. This strategy also recommends encouraging the processing of the oilseed crops, fruits, vegetables, cotton, meat, skin and feed and the exports of medical plants.

The objectives and the activities of SNE are implemented based on 4 strategic axes. The first axis is to

divide fields of responsibility of a directorate of foreign trade (ONAC) which existed until 2010 and to establish a directorate of export promotion (APEX) in charge of export promotion. The second axis is to strengthen the awareness on the importance of export. The third axis is to strengthen the relationship with foreign investors. The fourth axis is to develop the processing of agricultural products in order to increase the added value.

There are issues in each aspect that should be solved in order to reach the objectives of the SNE; technical aspects (access to techniques and know-how, access to markets), financial aspects (access to funds, lack of financial initiative for export, lack of guarantee system and insurance for export), institutional aspects (lack of stimulus policies, absence of specialized organizations for export promotion, absence of experts organizations, inefficient administrative procedures), logistics and transportation aspects (high cost, overage and lack of means of transportation, overage storage, packing and processing facilities).

The SNE plans four pilot programs for mango, onion, sesame and shea butter for the period of 5 years. It tries to achieve the goal by providing assistance to overcome constraints of marketing channel development in agricultural sector to fully use the comparative advantages on the markets. Therefore, it aims at strengthening productivity and competitiveness of identified potential agricultural products through the following actions

- a) Strengthening the technical capacities of stakeholders dealing with the target products
- b) Strengthening and improvement of relationship between stakeholders on the target products and banks
- c) Improvement for the use of existing infrastructures for storage or packing for exports
- d) Improvement for air and land transportation conditions

(3) Strategy for Agricultural Value Chain Development (SDFA)

The government of Burkina Faso formulated the Strategy for Agriculture Value Chain Development (SDFA) in 2012 under the initiative of the General Directorate of Promotion of Rural Economy (DGPER) of the Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARHASA). SDFA aims at developing agricultural value chains in order to strengthen the food security, and promote poverty reduction and economic growth. In order to achieve the goals, it is necessary to promote organizing stakeholders and the agricultural value chains, improve the accessibility to funds, promote the agricultural products, strengthen technical capacity of stakeholders for the development of agricultural value chain and improve marketing of the agricultural products.

Targets of this strategy are the development of the value chains of sorghum, millet, maize, rice, cowpea, onion, mango, sesame, cotton and cassava that have already been supported and that of peanut and soya which have development potentials (12 value chains in total). Five implementation policies are 1) to organize the value chains through meetings and for the stakeholders to participate to the value chains, 2) to promote capacity building of the stakeholders, 3) to ensure the quality of the agricultural and processed products, 4) to improve governance of the value chains, and 5) to submit balance sheet of the companies.

This strategy was validated as a policy document in MARHASA. Currently (April 2015), MARHASA has prepared for validation in the Cabinet meeting of Burkina Faso.

2.3 Agriculture Administrative Organizations

2.3.1 Ministry of Agriculture, Water Resources, Sanitation and Food Security

(1) Organization

The Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARHASA) is the organization in charge of production and sale in agriculture sector in the government of Burkina Faso. An organization chart of MARHASA approved by the Cabinet meeting in February 2015 is shown in the figure below. The central organization concerned with agricultural sector in MARHASA consists of 5 general directorates and 4 directorates in charge of administrative support. The 5 directorates are: General Directorate of Study, Planning and Statistics (DGESS), General Directorate of Plant Production (DGPV), General Directorate of Promotion of Rural Economy (DGPER), General Directorate of Landholding, Training and Organization of Rural Society (DGFOMR) and General Directorate of Agricultural Facilities and Development of Irrigation (DGADI). As local organizations, there are regional directorates of MARHASA (DRARHASA) in regions, provincial directorates of MARHASA (DPARHASA) in provinces, Zone of Technical Support (ZAT) and the Unit of Technical Facilitation (UAT) in the departments, communes and villages.

DGESS are responsible for conceptualizing, planning, coordinating, monitoring and evaluating sector development activities. The main roles of DGPV are to strengthen food and nutrition security and promote sustainable development of agricultural products. It is particularly in charge of the agricultural administration mainly for cultivation. The main role of DGPER is promotion of rural economy and DGPER is in charge of post-harvest, processing and marketing. Furthermore, it is also in charge of promotion of organizing value chains of each crop. The roles of DGFOMR are to achieve sustainable management of soil and stabilization of land management in rural area. Finally, DGADI is responsible for coordination and implementation of national policies for sustainable development of irrigation agriculture and sustainable management of agricultural land.

DRARHASAs are placed in 13 regions. They are in charge of formulation, planning, monitoring, evaluation of agricultural, water resources, sanitation and food security policies at the regional level. They also coordinate, direct and manage the activities of DPARHASAs. The DPARHASAs are placed in 45 provinces and in charge of formulation, planning, monitoring and evaluation of agricultural, water resources, sanitation and food security policies at provincial level. They coordinate and manage the activities of ZATs. The ZATs and UATs implement and monitor the policies and the strategies of MARHASA in their responsible areas in cooperation with all organizations in the MARHASA. Extension activities in fields are conducted by the experts and extension staffs of the ZATs and UATs. Also, Rural Promotion Centers (CPR) in charge of vocational trainings on agricultural techniques are positioned under supervision of the DRARHASAs.

Procedures of preparation and approval of budgets are the followings.

- a) Technical departments of each general directorate prepare draft budgets of each directorate.
- b) The draft budgets are submitted to Directorate of Administration and Financial (DAF). Based on them, DAF prepares the draft budget of MARHASA and submits it to the Ministry of Finance.
- c) The Ministry of Finance discusses with each ministries including MARHASA and prepares the draft governmental budget.
- d) The draft governmental budget is deliberated in the national assembly of Burkina Faso. If the national assembly approves, the budget is officially accepted.

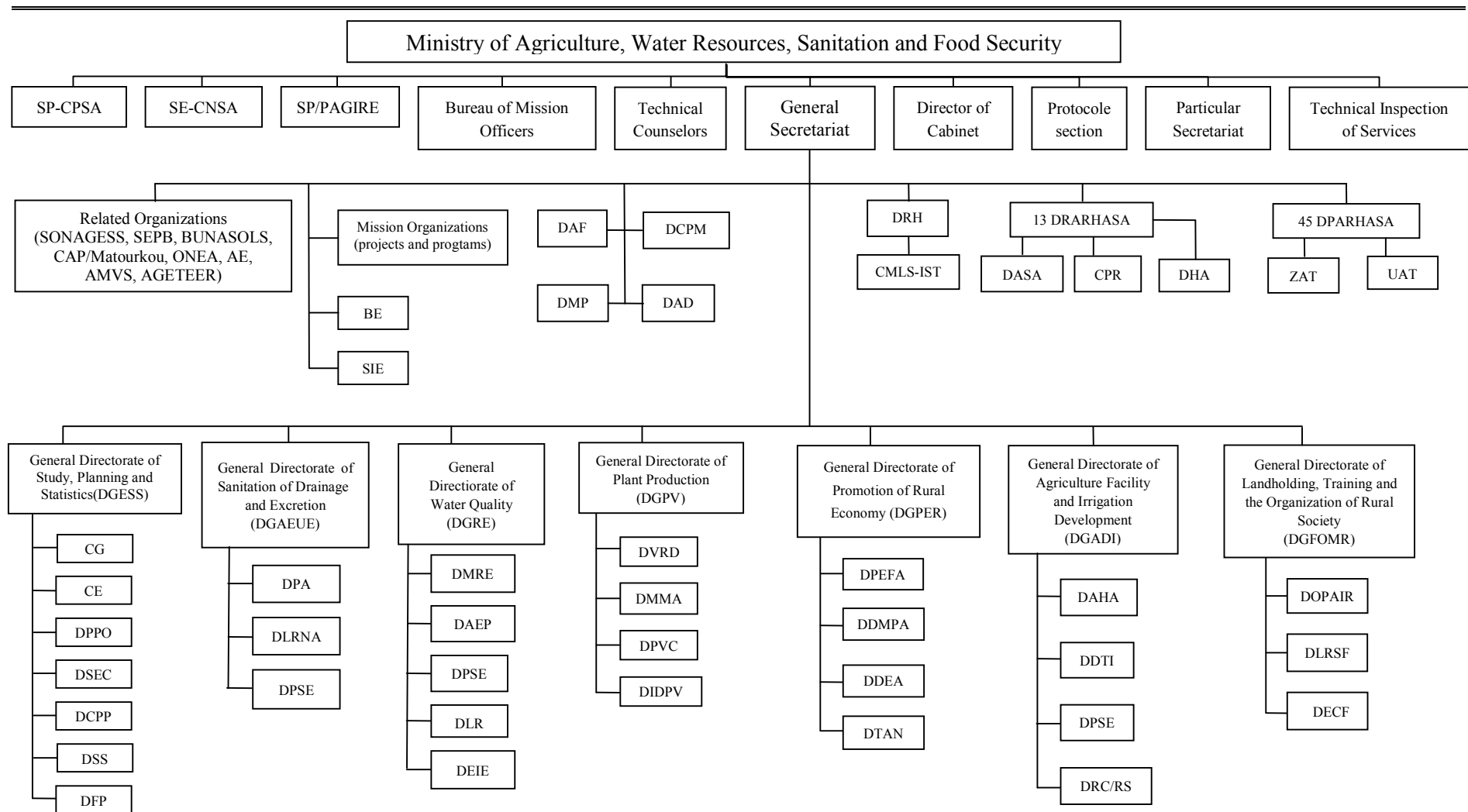


Fig. 2.3.1 Organization Chart of the Ministry of Agriculture, Water Resources, Sanitation and Food Security

(2) Financial Aspects

The budget of the Ministry of Agriculture and Hydraulics¹⁰ (MAHR) is increasing together with increasing the importance of agriculture sector. As showed in the table below, the budget of the MAHR occupied 24% of the budget of all ministries in 2012, which was the largest among all ministries.

Table 2.3.1 Change of Project Budget Allocation of MAHR

[Unit: million FCFA]

	2010		2011		2012	
	Amount	Percentage (%)	Amount	Percentage (%)	Amount	Percentage (%)
MAHR	109,826	19.9	132,981	24.7	161,540	24.0
Total of all ministries	550,994	100.0	538,691	100.0	627,661	100.0

The budget amount in this table is only project budget, not including administration cost, personnel expenses, etc.

Source: Made from budget documents of the Government of Burkina Faso

According to “Agriculture and Forestry of Burkina Faso 2013” published by Japan Association for International Collaboration of Agriculture and Forestry (JAICAF), the government budget is calculated including financial support by donors. The percentages of the domestic source and the donor support in the budget are determined by fixed rates for all sectors (domestic source; 31%, grant support; 19% and loan from donors; 50%).

2.3.2 General Directorate of Promotion of Rural Economy (DGPER)

The DGPER, which is the implementing organization of the Project, consists of 4 directorates, namely Directorate of Development of the Markets of Agricultural Products (DDMPA), Directorate of Development of Agricultural Business (DDEA), Directorate of Processing, Food, Promotion of Standards and Nutritional Quality of Agricultural Products (DTAN), and Directorate of Economic Promotion of Agricultural Value Chain (DPEFA). DGPER is in charge of implementation of the policies and strategies related to post-harvest, processing, distribution and marketing in agriculture sector. It focuses on promoting harmonization and coordination between the producers and actors of the markets and, its main tasks are implementation of those policies and strategies.

Number of staffs in DGPER is 82 staffs in February 2015. Table 2.3.2 shows number of staffs of in each directorate in DGPER. The project budgets of DGPER were 3,750 million FCFA (2012) and 4,946 million FCFA (2013).

Table 2.3.2 Number of staffs in Each Directorate in DGPER (Feb. 2015)

Directorate	Number of Staffs
With directorate general*	29
DDMPA	14
DDEA	14
DTAN	11
DPEFA	14
Total	82

*Include drivers

The main activities of each directorates of DGPER are mentioned below.

¹⁰ It was reorganized to the MASA in July 2013. It was reorganized to the MARHASA in February 2015.

(1) DDMPA

- a) Strengthening of organizations and facilities for markets of agricultural products;
- b) Support for promotion of agricultural products and sales for the domestic market and export;
- c) Establishment and management of public funds for price stabilization of agricultural products;
- d) Development and monitoring of frameworks and conditions of regulations concerned with the intervention of public actors to the markets of agricultural products.

(2) DDEA

- a) Promotion of agricultural business;
- b) Improvement of accessibility to funds and other financial services for agriculture stakeholders;
- c) Promotion of mechanisms to reduce agricultural risks;
- d) Establishment and promotion of strategies of Public-Private Partnership in the agricultural sector.

(3) DTAN

- a) Promotion of standards and quality inspection for agricultural products and foodstuffs;
- b) Propulsion of processing of domestic agricultural products;
- c) Promotion of domestic agricultural products and consumption of processing foodstuff.

(4) DPEFA

- a) Supervise and economical analysis for promotion of agricultural products;
- b) Encouragement of partnership between private organizations and producers' organizations.

2.3.3 Agricultural Extension

DVRD in DGPV is responsible for implementing agricultural extension policies. DVRD is in charge of the extension related to production (from cultivation to harvest). The extension works on fields is implemented by experts and extension staffs belonging to ZATs and UATs. DGPER and DGFOMR are responsible for organizing value chains or specific organizations. DGPER is in charge of organizing value chains of each crop as well as organizing each professional organization focusing on sales. DGFOMR focuses on support for producers' organizations in the value chains, and promotes dialogue and coordination among different businesses. The personnel of the central organizations sometimes directly provide trainings to producers' organizations, etc. However, only 512 extension staffs are allocated to the UATs in Burkina Faso and this number is less than half of the planned number of staffs, 1,031 staffs (Situation du réseau d'encadrement des 13 DRAH en 2011). It shows that the number of extension staffs in UATs is insufficient at present. In addition, it is also mentioned as a problem that the specialized field of the extension staffs is mainly cultivation although the importance of market oriented agriculture is increasing.

2.3.4 Agricultural Research

Agricultural research in Burkina Faso is undertaken by the Institute of Environment and Agricultural Research (INERA) which belongs to the Ministry of Scientific Research and Innovation. The head office of the INERA is in Ouagadougou, and the national territory is divided into 5 areas according to agricultural environment. In each area, the Regional Centers of Environmental and Agricultural Research (Centre Regional de Recherches Environnementales et Agricoles: CRREA) and the Center of Environmental, Agricultural Research and Training (Centre de Recherches Environnementals,

Agricoles et de Formation: CREAM: in Kamboinsé), which are responsible for research for crops that is suitable for local conditions, are set up.

In 2009, INERA decided to undertake 16 programs in the fields of plant production, animal production, forest production and natural resources/production system. In the field of plant production, there are 5 research programs for traditional cereals, oilseed plants¹¹, vegetables, rice and cotton.

Crops researched by each CRREA in the field of plant production in 2012 are the following. In case of maize, sorghum, millet and cowpeas, the CRREAs tested selected varieties in the fields.

- a) CRREA Centre, Saria (Koudougou) : sorghum and cowpeas
- b) CRREA Est, Kouaré (Fada-Ngourma) : sorghum, maize and rice
- c) CRREA Nord-Ouest, Di (Tougan) : sorghum, rice, maize and millet
- d) CRREA Ouest, Farako-Ba (Bobo-Dioulasso) : rice, mango, tomato, onion and cashew nuts
- e) CRREA Sahel (Nord), Katchari (Dori) : sorghum, millet, cowpeas and fruits in Sahel area

Burkina Faso was selected as a target country in the second phase of the West Africa Agricultural Productivity Program (WAAPP), and the research activities of mango have been supported in the program. These research activities are carried out in the centers of Kamboinsé and Farako-bâ. Themes of these research activities are 1) tests for introducing new varieties, 2) methods of grafting and 3) effect of the climate changes to the productivity.

Table 2.3.3 Change of Budget Allocation* of INERA

	2011	2012	2013
Amount of budget	3,832	3,418	4,948

*: Not including administration cost and personnel cost.

2.4 Present Situation and Constraints in Agricultural Sector

2.4.1 Characteristics of Agricultural Production

(1) Farming Zone

The following figure shows farming zones of the major cereals and cash crops in Burkina Faso. Depending on the precipitation and soil conditions in local areas, types of cereals, which become main crops, are determined. In general, millet is cultivated in zones where the precipitation is low, and more sorghum and maize are cultivated in zones where the precipitation is higher. Cereals such as millet and sorghum, sesame and cowpea are grown under the rainfed cultivation method during the rainy season. However, rice and maize are cultivated even in the dry season in irrigated areas. In addition, vegetables such as tomato and onion are mainly cultivated near ponds or in lowlands during the dry season. The cultivation zones of cash crops also vary by types of crops, and each cash crop has a main production area. The cultivation area per producer decreased from 0.96 ha/producer in 1998 to 0.85 ha/producer in 2008 due to the population increase¹².

¹¹ Sesame, peanuts, cowpeas

¹² FAOSTAT

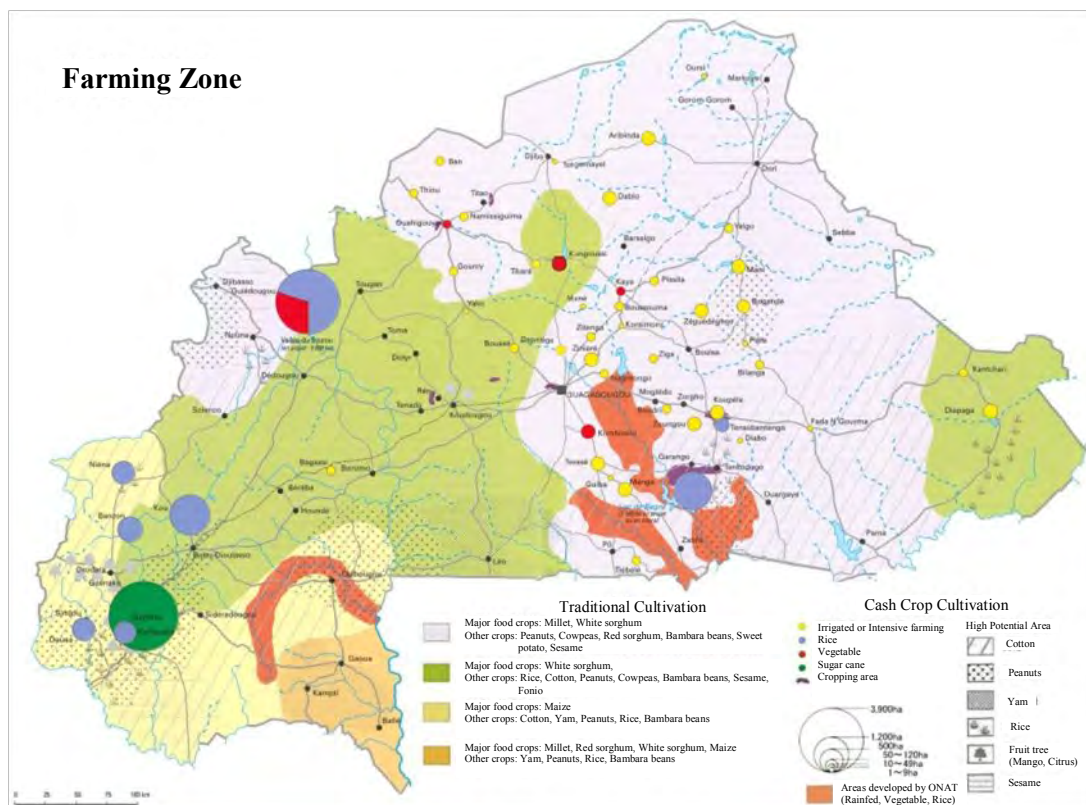


Fig. 2.4.1 Agriculture Zoning in Burkina Faso

Source: "Burkina Agriculture and Forestry" JAICAF (2013)

(2) Cropping Area

The change of the cropping area from 2002 to 2013 is shown in the figure below. Cultivable area in Burkina Faso is estimated at about 9 million hectares. Six or seven million ha of the cultivable area are cultivated in recent years¹³. The main cereals such as sorghum, millet, maize and rice occupy more than 60% of total cropping area (figure below), and the percentage has not changed in recent years. The total cropping area has increased since 2007 because of expansion of cropping area of the cereals. Pulses (cowpea, etc.) occupy about 15 to 20% of the total cropping area following the cereals. Cotton and oilseed crops (soybean, peanuts and sesame) occupy 5 to 10% respectively. The cropping area of cotton that is a major cash crop levels off in recent years, and the area of oilseed crops is slightly increasing. Cereals, pulses, cotton and oilseed crops occupy more than 95% of the total cropping area. Fruits, vegetables, beans, tubers only occupy less than 1% respectively.

¹³ JICA, "Report of data collection survey on agriculture sector in Burkina Faso, 2012"

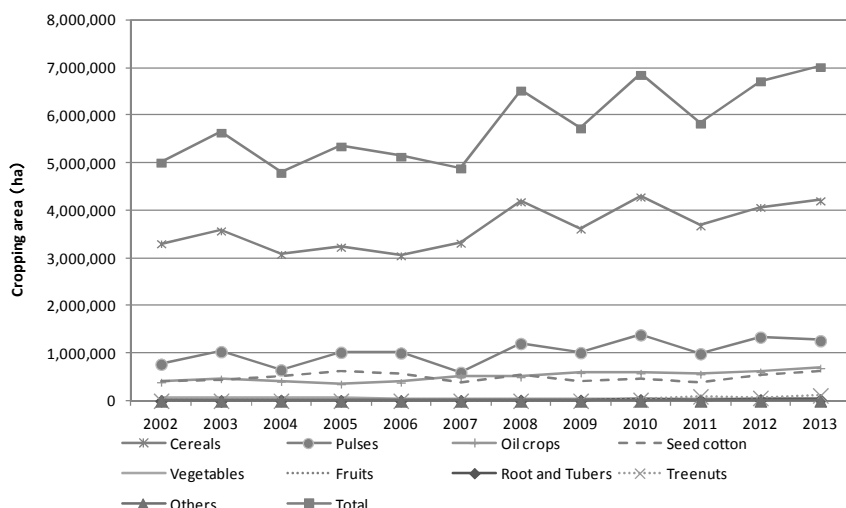


Fig. 2.4.2 Change of Cropping Area

Source: FAOSTAT

(3) Production Quantity

The following figure shows the change in production quantities of crops from 2002 to 2013. The production quantity of cereals is much larger than that of others, followed by pulses and vegetables. The production quantities of pulses and tubercles have increased in recent years. The production quantity of the “others” is large because it includes sugar cane.

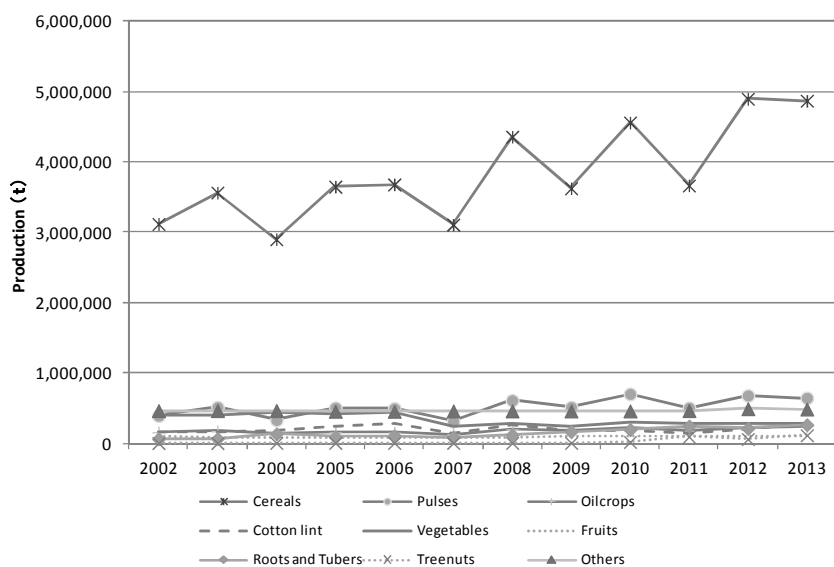


Fig. 2.4.3 Change of Production Quantity

Source: FAOSTAT

(4) Production Value

The figure below shows the change in net production value of agricultural products. While there are annual fluctuations, the net production value has gradually increased and the total value was more than 2.0 billion dollars in 2013. The cereals, which have the largest net production value, occupy about 40% of the total value. Following this, oilseed crops and cotton occupy about 15 to 20% respectively. The cropping area of cotton, which is a main cash crop, is less than 10% and smaller than that of pulses. On the other hand, the net production value of cotton is more than 10% of the total value and more than that of pulses (about 10%). However, the net production value of cotton is decreasing and

that of oilseed crops is increasing recently. As a result, the position of the crops start changing. The percentages of fruits, vegetables and tubers are less than 5% respectively and the contribution of these crops to the total value is not large.

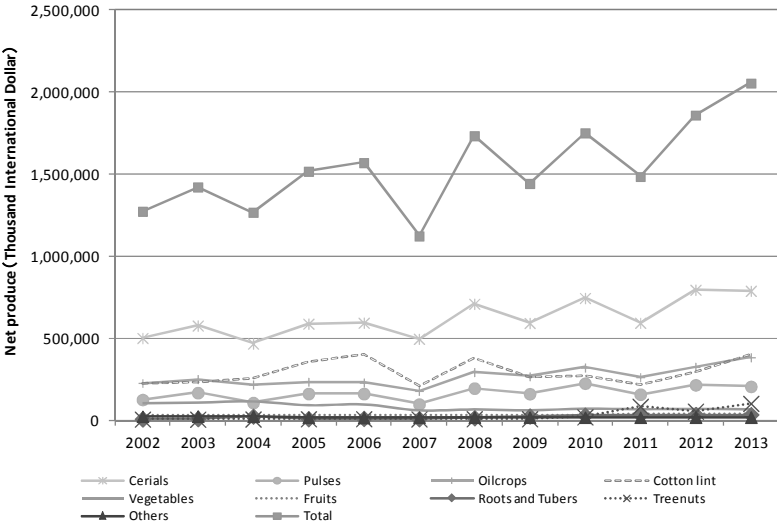


Fig. 2.4.4 Change of Net Production Values

Source: FAOSTAT

2.4.2 Agricultural Organizations and Agricultural Producers Organizations

In agricultural development, support for agricultural productivity improvement has been focused on for a long time. Recently, however, it emphasizes on linking small scale farmers to markets in order to develop not only agriculture sector but also private sector, thus several efforts have been made to integrate small farmers into markets. Following this trend, Burkina Faso government facilitates to organize filière, which is a value chain linking up-stream to down-stream of agricultural production, at commune, province and regional levels. It also tries to reorganize traditional organizations at village levels and organizations by different industries such as farming, livestock, forestry, fisheries, processing and export business to vertically-integrated organizations at national level for single agricultural commodity.

(1) Role and Function of Producers’ Organizations

Small scale farmers have constraints such as 1) access to natural resources (land, forest resources, water etc.), 2) access to productive assets (input, financial services and output markets), 3) information asymmetry and lack of access to knowledge and 4) voice in policy making.

It is increasingly recognized that creating and strengthening producers’ organizations become effective means to cope with the constraints. The producers’ organizations have three (3) roles and functions as described below.

Table 2.4.1 Role and Function of Producers’ Organizations

	Role	Function
1	Collaboration and Single Window	They can protect interests and strengthen bargaining power of farmers. Furthermore, they efficiently implement activities as a single window for individual farmers. For example, they can provide useful information and socio-economic services such as technical guidance, education and material support to individual farmers efficiently.
2	Complementary to Market Mechanism	They can improve efficiency and complement functions of imperfect market through functions of producers’ organizations and policy reforms by using its functions. For example, they help to realize scale of economies, provide stable access to markets through large-scale supply, facilitate efficient acquisition of techniques and information, improve access to agricultural finance, and entry to niche market (fair trade).

	Role	Function
3	Improvement of Representation	They can improve socio, economic, political position and bargaining power of individual producers through collective actions. For example, they can strengthen negotiation power for purchase of agricultural input and exercise influence on policy making.

Source: Tsutomu Takane (2008) "New Type of Producers Organizations in Rural Area of Africa Today –In Case of Ghana" modified and added.

(2) Type of Agricultural Organizations and Their Situations

There are two types of agricultural producers' organizations, namely voluntary organizations of small scale farmers (cooperative and group) and "Chambre d' agriculture" (Chamber of Agriculture) as public organizations. The voluntary organizations are regulated by the law called "cooperative and group" (Loi 014/99/AN) and "Chambre d' agriculture" (national and regional level) are regulated by decree N° 2001-770 and decree n° 2001-771. Besides, the law called "creation of association" (Loi.010/92/AN) regulates creation and registration of voluntary and non-profit organizations (all sectors), and Ministry of Internal Affairs has the responsibility. In this context, "cooperative and group" and "Chambre d' agriculture" is explained briefly.

1) Cooperative and Group

The law called "cooperative and group" stipulates cooperatives and groups as minimum unit which are entitled to undertake economic activities. It decides each definition, constituents, approval procedures and compliance rules. The differences are summarized in the table below.

Table 2.4.2 Differences between Cooperatives and Groups

	Cooperative (Coopérative)	Group (Groupment)
Definition	Cooperative is a voluntary organization in a form of enterprise, and aims to meet socio, economic and cultural interests.	Group is a voluntary organization which members have common interests, particularly economic characteristic.
Minimum Members	Consumers Cooperative: 15 people	Consumers Group: 15 people
	Producers Cooperative: 5 people	Producers Group: 10 people
	Processors Cooperative: 5 people	Other type of Group: 5 people
	Other type of Cooperative: 7 people	
Certification Authority	Provincial Governor (Haut-Commissaire)	District Chief and Mayors ¹⁴ (Maire)
Compliance rules	Recording of members and corporative equity	Recording of members and share of expenses for each member.
	Auditing of accounts	Guidance from external auditors
	Preparation of audit reports	Preparation of audit reports
	Holding general assembly	Holding general assembly
	Setting-up of management committee	Setting-up of office
	Setting-up of control committee	Setting-up of control committee
	Corporative equity	
Maintaining of reserve fund		
Responsible Ministry	MARHASA is in charge of support for organization and registration procedures.	

Source: Modified and added on "Burkina Agriculture and Forestry", JAICAF (March 2013)

"Cooperative" is an organization following internationally certified definition of cooperative. The compliance rules of "Group" soften some obligations such as exemption of preparing balance sheets and records of share of expenses instead of cooperative equity.

¹⁴ Referring current local administration, "Haut-commissaire" is for "Province" and "Maire" is "Department" or "Commune" respectively.

The law also classifies umbrella organizations and scales into following three (3) types¹⁵. “Federation” and “Confederation” can become members of West African organizations and international organizations.

Table 2.4.3 Types of Organizations and their Definition

Type of Organization	Definition
Union	Organization assembling more than two cooperatives or groups.
Federation	Organization assembling more than two unions
Confederation	Organization assembling more than two federations.

There is “Confédération Paysanne du Faso” (CPF) as typical producers’ organization. The confederation was created by 14 agricultural organizations (unions and federations) aiming at increasing food production of family farms and improving income for farmers.

2) Chambre d’Agriculture

“Chambre d’Agriculture” were created at 13 regions and at national level in November 2003 as representative organizations for those who are mainly engaged in agriculture sector (agriculture, livestock, fisheries and forestry) in conformity with decrees (770 and 771) in 2001. “Chambre d’agriculture” are organized at village level (Including one representative from agriculture, livestock, fisheries and forestry including one woman representative) and at district level (6 representatives) and at provincial level, and then “Chambre Regionale d’Agriculture (CRA)” is organized at regional level. CRA creates a regional council that is consisted of 7 provincial representatives. Provincial representatives should include 20% of village representatives and 20% of women representatives. The table below explains briefly about “Chambre d’agriculture”.

Table 2.4.4 Summary for “Chambre d’Agriculture”

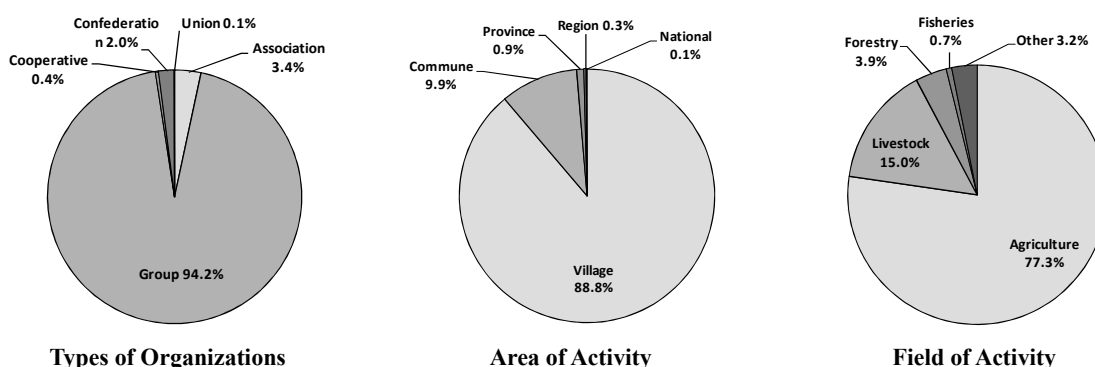
Role	(1) Representation of farmers and advisers for farmers, (2) Training and information dissemination, (3) Support for farmers
Standing	Public representative organization for agriculture which all farmers and agricultural organizations belongs to.
Structure	<ul style="list-style-type: none"> ♦ There are steering committee, technical committee and secretariat. ♦ Under management of unpaid president (farmer representative), secretariat chief (seconded from MARHASA), secretary and accountant work as full time paid staff.
Management Policy	Self-governance by producers for all activities such as management and selection of representatives.
Budget	<ul style="list-style-type: none"> ♦ The government subsidy (salary of full-time staff, fuel and light expenses and petrol expenses) is only a source for income. ♦ Office buildings and lands are granted by the government.
Others	With the decentralization policy, CRA can directly have contracts with donors and private companies. There are some CRAs which actively implement activities by having contracts with donors (CRA Hauts-Bassins in Bobo-Dioulasso has provided trainings for agricultural extension officers in collaboration with PAPSA of World Bank since 2011).

Source: Interview with “Chambre d’Agriculture” at national level (21 May 2013)

3) Situation of Agricultural related Organizations

It was reported that there were 25,650 agricultural related organizations (Associations, Groups, Cooperatives, Confederate and Unions) in the country according to “Rapport D’Analyse du Recensement des Organisations Professionnelles Agricoles (OPA) au Burkina” prepared by MARHASA in May 2012.

¹⁵ According to DOPAIR of DGFOMR, Burkina Faso government ratified “ Organization for the Harmonization of Business Right in Africa”(Organisation pour L’Harmonisation en Afrique du Droit des Affaires: OHADA) in February 2011,which was approved by 17 francophone countries in West Africa in December 2013, and was enforced in the country.



According to the report, about 94% of agricultural related organizations are categorized as type of groups and most of activities are at commune or village level. (village: about 89%, communes: about 10%). The composition of the members is about 36% for men, about 37% for women and 24% for mixed. This means women organize these organizations more than men. The fields of activities are mainly for agriculture (about 77%) and livestock (15%). Approximately 84% of studied organizations are engaged in production, and about 6% and about 68% are in processing and marketing respectively. Based on this result, it is assumed that about 58% of agricultural related organizations (14,831 organizations) conduct activities in more than two different fields.

(3) Inter-Professional Organizations for Agriculture Filière

Filière indicates “chain of stages from production to consumption for a specific product” and includes stakeholders and relations between organizations in the chain¹⁶. Filière approach aims to improve market system by removing obstacles at each stage of chain from production to consumption for the specific product. For this purpose, it is necessary to strengthen capacity of stakeholders in sub-sectors for specific agricultural commodities, and cooperate with stakeholders on filière and establish consultation mechanisms for stakeholders. Burkina Faso government has enacted “the law on creation of inter-professional organization in the field of agriculture, forestry, fisheries and livestock” (loi 050-2012/AN) in 2012 aiming at collaboration and establishment of consultation mechanisms for stakeholders on filière. The law regulates provisions, structure, competence and functions of filière inter-professional organizations. The law is briefly summarized below.

Table 2.4.5 Outline of Law for Creation of Inter-Professional Organizations

Item	Outline
Structure	Inter-professional organizations have corporate entities and are in charge of single agricultural commodity at national level. The inter-professional organization consists of at least two sub-sectors including production sub-sector.
Membership	Only national level professional organizations are allowed to apply membership for inter-professional organizations.
Role and Responsibility	The main responsibilities of inter-professional organizations are as follows. <ul style="list-style-type: none"> (1) To promote consultation in each sub-sector by strengthening information sharing and opinion exchange and facilitating harmonization of filière (2) To promote and manage inter-professional agreements for stakeholders in each sub-sector (3) To improve and guarantee products quality and label them (4) To formulate policies, strategies, plans and methods for promotion of filière and protect interests by representing filière (5) To develop plans and tools for promotion of filière through research, trainings and advices. (6) To develop and propose simple procedures and taxation methods in order to access to cash crops and input goods. (7) To support trainings of professional organizations and activate professional organizations on filière stakeholders. (8) To collect, process and disseminate information regarding to filière strategy, statistical information on member organizations and information that is necessary to conduct impact monitoring of inter-professional organizations.

¹⁶ Soyako Uesu, Yasuo Hasegawa and Miki Yosida (2010) “Participation of the Poor in the Market and Way of Support of Donors – In case of filière analysis for Senegal” for JICA Report of Associate Researcher.

Item	Outline
Management	The management of inter-professional organization should be conducted in accordance with the basic principles below. (1) Principle of unanimity: Unanimity is necessary for decision making. (2) Principle of representativeness: Professional organizations must be qualitatively and quantitatively represented in the industry. (3) Principle of equivalence: Right to vote for representatives of professional organizations in each sub-sector is fairly given. (4) Principle of complement: Role and responsibilities of inter-professional organizations are not entrusted to its members.
Inter-professional Agreement	Member organizations need to give their consent to the inter-professional agreement in written form and the agreement should be approved by responsible Ministry and Ministry of Finances. All stakeholders on specific filière need to follow the approved agreement (No matter whether they are member of inter-professional organization or not). The inter-professional agreements particularly deal with the following contents. (1) Adjustment of supply and demand, (2) Management of inter-industrial relations in concerned sub-sectors, (3) Participation in markets and enforcement of regulations on price and payment condition, (4) Procedures and decision on quality standards of products, (5) Information on supply and demand, (6) Implementation of applied research programs, (7) Promotion of products in the markets and (8) Counter-measures for unstable climate.
Funding Sources	The financing source is composed of inter-professional organization own fund and obligatory contributions (CFO) by its members. <ul style="list-style-type: none"> ♦ The financing source includes contribution from the members, CFO paid by each sub-sector, remuneration for implementation of activities, investment products, gift and inheritance. ♦ CFO can be forced to member organizations under the agreement after authorization of administration, but it is regulated by detailed rules about establishment, conditions of enforcement and collection. CFO can also be deducted from sales of imported products.
Relationship with the government	The role of the government is to support, advice and follow-up on the activities of inter-professional organizations but the methods are set by detailed rules. The government should have consultation when policies and strategies regarding filière are formulated. The inter-professional organization should submit the annual reports to responsible Ministry and Ministries of Finances, which include account reports, summary of activities, minute of meeting on general assembly and summary of implementation of inter-professional agreements.

Source: Extracts from “the law 050-2012/AN”

DGPER has selected promising filières (as described below) in order to promote organization of agriculture filières and appointed responsible staffs to the filières¹⁷.

Table 2.4.6 Situation of Filière Organizing

Agricultural commodities that filière organization are progressing.	Fruits and Vegetables, Soybean, Cowpea, Cassava, Peanut, Cashew nut, Sesame, Maize and Rice
Agricultural commodities that filière organization has started.	Taro, Yam

Up to now, agriculture commodities which inter-professional organizations have already been established for are banana, onion, rice and milk.

The promising filière of DGPER are only for agricultural commodities that donors (including NGO) have targeted in their projects, and the inter-professional organizations have been created with the support of the projects of donors. The question is about the sustainability of these inter-professional organizations after the project completion. In fact, as “Comité Interprofessionnel du Riz du Burkina (CIR-B)” encountered financial difficulties in 2007 after completion of the project, and the donors have started to support to activate it in 2010.

In addition, there is a tendency to create new inter-professional organizations on filière for a single agriculture commodity while there are existing organizations. For example, although there is “Comité Interprofessionnel des Céréales du Burkina (CIC-B)”, “Association Professionnelle des Commerçants et Exportateurs de Niebe du Burkina (APCEN-B)” has been created in an attempt to create inter-professional organization on filière for cowpea in the future under the initiative of MARHASA in

¹⁷ Interview with DGPER (10 June, 2013)

May 2012.

(4) Support for Organizing Agriculture Filière

The two general directorates of MARHASA are responsible for supporting organizations of agriculture filière.

Table 2.4.7 Filière Organizing and Responsible Directorates of MARHASA

General Directorate	Directorate	Contents of Responsibility	Common Issue
DGPER	DPEFA	Responsible for organizing single agricultural commodity filière, especially organizing and strengthening occupational groups focusing on marketing.	Coordination of dialogues and integration for professional organizations in single agricultural commodity filière
DGFOMR	DOPAIR	Responsible for organizing cooperatives and groups, registration and strengthening of management in single agricultural commodity filière.	

On the other hand, DVRD of DGPV is in charge of agriculture extension from production to harvest in agriculture filière. As stated previously, “Chambre d’agriculture” and CEP have also provided various supports to farmers and producers’ organizations.

DGPER elaborated a “concept note for organization of agricultural filière” in 2010 in order to create inter-professional organizations in agriculture filière. The procedures on creation of inter-professional organizations of agriculture filière are outlined below.

Table 2.4.8 Procedures on Establishment of Agricultural Filière Inter-Professional Organization

Farmers	Distributors	Processors
DPARHASA conducts information collection on stakeholders and supporters, enlightenment and consultation, and then compile a list of professional organizations. CRA and provincial authorities (in charge of approval of professional organizations) are responsible for updating the lists.	DPARHASA compiles a list of distributors in filière in provinces in collaboration with CRA and CCI. The provincial governors approve the lists.	DPARHASA compiles a list of processors in provinces in filière in collaboration with CRA and CCI. The provincial governors approve the lists.
To organize cooperatives and groups as unions at commune, provincial and regional level.	To organize professional organizations with stakeholders at provincial, regional and national level	To organize professional organizations with stakeholders at provincial, regional and national level.
<Responsible Agency>: MARHASA, CCI (chamber of commerce)	<Responsible Agency>: MARHASA, CRA, CCI.	<Responsible Agency>: MARHASA, CRA, CCI.



Creation of Inter-Professional Organizations

The inter-professional organization in filière is created by representatives of each sub-sector (farmers, processors, distributors) in the presence of CRA, CNA, CCI, DGPER and DGFOMR in conformity with the law concerning the creation of inter-professional organizations in filière.

Source: Concept note for organization of agriculture filière of DGPER

(5) Good Practices of Farmers Organizations

Good practices obtained through interviews with producers’ organizations and agricultural organizations are summarized below.

Table 2.4.9 Good Practices on Mediation and Guarantee for Financial Institutions

Item	Contents	Organization
Agricultural Input Procurement -1	The members who want to procure agriculture inputs should consult with financial institutions and make repayment arrangements to financial institutions individually. But the producers' organization puts together the wishing members, and then procures agriculture inputs on behalf of them and distributes them to the farmers. →This practice contributes to realization of bargaining power and prevents the members from spending the loans on consumer goods. However, this practice does not solve the issue that the members have unpaid loan to financial institutions.	ASK (Association)
Agricultural Input Procurement -2	Producers' organization puts together the members who want to procure agricultural inputs. Then, producers' organization borrows money from financial institutions on behalf of the members and distributes them to the members. Producers' organization covers the expenses of individual members for the input by deducting from the joint sales of products. Then, producers' organizations make repayments to the financial institutions. →This practice contributes to realization of bargaining power and prevents the members from spending the loans on consumer goods. Also, this practice solves the issues of un-repaid loan to financial institutions by the members.	Coopeka (Cooperative)
Agricultural Inputs Procurement -3	Producers' organization and financial institutions conduct jointly assessments of applications from the group members and decides eligible groups for loans. → The collective liability (solidarity guarantee) of the members prevents the members from spending the loans on consumer goods and promotes the members to repay the loan to the financial institutions.	Sugr So Zama (Group Union at district level)
Procurement of Animals	The financial institutions hand over necessary cash to the members who wish to procure animals at the general assembly. In case of the procurement of animals, the members should procure animals with their own responsibilities since the members feel dissatisfaction and unhappiness with procured animals if the producers' organization procures animals on behalf of the members. → "Reputation Mechanism" prevents the members from spending the loans on consumer goods and promotes the members to repay the loan to the financial institutions. ("Reputation Mechanism" works well in relatively closed communities in which transactions are frequently conducted.)	ASK

Table 2.4.10 Good Practices on Securing Agriculture Inputs

Item	Contents	Organization
Chemical Fertilizers	In order to purchase fertilizers, each group in the union keeps two bags of agricultural commodities (about 100 kg × 2 bags) after harvests and sells them in the markets when the price becomes higher. The union procures all fertilizers together on behalf of the group members. →This practice prevents the members from spending the loans on consumer goods, strengthens the bargaining power and secures chemical fertilizers.	Sugr So Zama

Table 2.4.11 Good Practices on Price Stabilization of Products and Payment Methods

Item	Contents	Organization
Price Stabilization	As for marketing of products, producers' organization becomes basically a single window and negotiates with buyers. Or, the members are able to negotiate with buyers based on authorization from producers' organizations. In doing so, sales price of agriculture commodities are stabilized. It is prohibited in principle that a single member negotiates and sells their products individually.	ASK
Settlement Ways	The producers' organization issues statement of delivery to the members who have carried in cowpeas, and then pay cash in exchange for the receipt of statement of delivery after the collective marketing of cowpeas. The producers' organization issues statement of delivery to the members who have carried in agricultural commodities. The settlement in cash with the members is instantly made if buyers make a payment in advance. If not, producers' organization imposes buyers to make settlements within 15 days after the buyers purchase agriculture commodities since there is an obligation to settle the payment to the members within 30 days after the carrying-in, .	Coopeka

2.4.3 Contract Farming

(1) Constraints of Contract Farming

Contract farming is a form of business transactions that agriculture producers and processors/distributors/exporters (agribusiness enterprises) conclude contract agreements for specific agricultural commodities in written or verbal form, and then production, sales and payment are made in accordance with the contract.¹⁸ The agribusiness enterprises sometimes provide the producers with necessary inputs for production (seeds, seedling, fertilizers, technical guidance, etc.) and settle the costs incurred by deducting from the payments.

According to FAO¹⁹, the agricultural commodities that is suitable for contract farming are “perishable, require labor-intensive farming and cannot be marketable without contract procedures”. The non-traditional export agricultural commodities such as fruits and vegetables are more suitable than traditional export agricultural commodities such as grains. Small scale farmers have more competitive advantage for this kind of agriculture commodities than large scale farmers (farms) due to higher motivation of workers²⁰. On the other hand, agribusiness enterprises need to systematically purchase agriculture commodities meeting the same quality specification in huge quantities and response to requirement of traceability of agriculture commodities. To this end, agribusiness enterprises tend to contract with large scale farmers rather than small scale farmers due to higher transaction costs and labor costs.

From this point of view, the report of FAO indicates that creation of producers’ organizations should be an effective solution for both contract farmers and agribusiness enterprises. It will strengthen bargaining power of contract farmers and protect their interests by taking collective actions as producers’ organizations. The contract farmers are able to counter stronger position of agribusiness enterprises through improvement of bargaining power. Agribusiness enterprises can also reduce contract failures with individual contract farmers by facilitating distribution of input and expansion of credit granting through producers’ organizations, improving communication and field monitoring by the organizations, and improving the quality and expanding provided services. Furthermore, it will contribute to reduce transaction costs of activities related to negotiations for contract agreements, technical guidance and logistics.

However, the largest problem of contract farming in Burkina Faso is the problem of side-selling²¹ by the contract farmers. No effective measures are found to this problem since signed contract documents and creation of producers’ organizations do not work well. If the agricultural commodities are competitive and the market is unstable just like sesame, there is a higher possibility to generate the problem of side-selling by the contract farmers.

(2) Examples of Contract Farming

Here, green beans and soybeans are taken as examples of contract farming²². The outlines of contractors for each agriculture commodity are described below.

¹⁸ The contract agreement stipulates usually contract period, quality of products, specification, standards, production volume, cultivation method, deadline of production, way of transportation, purchasing price, payment procedures etc.

¹⁹ FAO and IFAD (2010) “Making the most of agricultural investment: A survey of business models that provide opportunities for smallholders”

²⁰ In case of agricultural commodities that the price is reflected by the quality, small scale farmers are able to produce higher quality of agricultural commodities than large scale farmers do due to the fact that small scale farmers use family labors whose incomes are increased as the quality is improved but large scale farmers use wage labor whose income are not increased although the quality is improved.

²¹ Selling all or a part of agricultural commodities contracted with agribusiness enterprises to the third party.

²² As for green beans, the interviews with Burkina Fresh was conducted on 29 April, 2013 and producers group NEB-nooma was conducted on 3 May 2013. As for soybeans, the interview with ESOP was conducted on 6 June 2013. The information described above is as of interviewed dates.

Table 2.4.12 Outlines of Contractors of Contract Farming (Examples)

	Green Beans	Soybeans
Enterprises	Burkina Fresh in Ouagadougou (also deals with fresh mangoes)	ESOP (Entreprise de Service et Organisation des Paysans) in Léo
Form of Enterprise	Exporter (acquisition of Global certificate)	Soybean processor
Products	Green beans (by airway)	Poultry feed (domestic sales)
Buyers	Dutch Importer (contract sales)	Sales to members of poultry farmers' organizations, etc.
Contract Farmers	Producers' group in Kaya: NEB – nooma (104 farmers in total in 14 sites)	65 groups in Léo (10-15 farmers per group: 1005 farmers in total)
Contract Volume	Purchase of all green beans produced in contract farmland (ha)	About 350 tons per year

The contents of contract agreement for each contractor are explained below.

Table 2.4.13 Outlines of Contract Farming (Examples)

	Green Beans	Soybeans
Reasons for Contract Farming	Contract farmers are experienced and close to Ouagadougou (Burkina Fresh).	Soybeans are cultivated in this area. There is an attempt to shift poultry feed from imported fish powder into proceeded soybean products.
Contract Period	Conclusion of contract agreement in written form for each season.	Conclusion of contract agreement in written form for each season.
Provided Services	Seeds, Fertilizers, Motor Pump Fuel and Maintenance fees. Installment payments on the cost of motor pumps (reduced from payments).	Certified seeds (multiplication of original seeds of INERA), Chicken manure and Technical Monitoring (cultivation groups). Seeds are provided more than necessary.
Purchasing Price	Fixed purchasing price determined through preliminary consultation.	Fixed purchasing price determined through preliminary consultation.
Purchasing Method	Contract by the cultivation land (ha) and purchasing all produced commodities.	Contract by the volume per group through consultation with each group.
Level of Techniques	Contract with only experienced groups in green bean cultivation.	Creation of cultivation groups which reach to the required technical standards through provision of technical guidance
Cultivation Method	Single cropping in irrigated area by motor pumps.	Single cropping or mixed cropping with rain-fed cultivation (decision by each farmer)
Land Use	Cultivation in irrigated lands. Farmers are allowed to use freely a part of the contract farms.	Cultivation in farmers' own land.
Monitoring	Explanation about the cultivation plans by group leaders. Assignment of two (2) field supervisors.	The two field technical supervisors employed by ESOP to conduct monitoring.
Quality and Specification	Cleaning and selection are conducted by Burkina Fresh, and green beans below the standards are sold in local markets.	Cleaning and selection are conducted by ESOP to remove impurities (quality and specification are not severely required since soybeans are raw materials for processing).
Collecting Method	Production quantity is adjusted in accordance with every export volume.	Each group conducts production and shipment during rainy season.
Transportation Method	Green beans are packed in plastics trays. Plastic bags are distributed in advance to Burkina Fresh. Burkina Fresh collects them by its own trucks.	Each group transports soybeans in plastic bags. Plastic bags are distributed in advance by ESOP.
Settlement Method	Settlement of the payment through bank transfer within 20 to 30 days after harvest.	Settlement of the payment to each group. Incentive fees are paid to the farmers who follow fully contract stipulations.
Storage Method	Cool rooms in Burkina Fresh	Soybeans are dried and kept in renting stores.
Problems	Even though inputs price has increased, purchasing price of green beans has not raised and contract area has decreased. Besides, the amount on contract agreement of the last year has not been paid yet.	It has become difficult to settle the payment due to the increase in the number of farmers. As ESOP was unable to obtain only a half of needed loans, only a half of the amount was paid to groups.

As for technical standards of contract farmers, quality and specification of agriculture commodity is guaranteed since Burkina Fresh concludes contract agreements only with rich experienced groups in green bean cultivation and ESOP creates cultivation groups with only farmers who reach to the

required technical standards through provision of technical guidance. The two contractors provide credits to motivate contract farmers to continue contract farming. Burkina Fresh tries to increase the production by allowing farmers to use freely a part of irrigated land and by purchasing all green beans produced in the contract farmlands. ESOP tries to motivate contract farmers by paying an incentive fee to those who follow the technical contract and settling the payment in cash. Due to these efforts and field monitoring, side-selling²³ has not yet been practiced.

On the other hand, both contractors have short-term contract agreements for every season in order to avoid sales risks. Nevertheless, the largest issue for the two contractors is payment delay. Burkina Fresh has not paid to cultivation groups since they have not yet received sales payments from the Dutch importer. ESOP has paid only a half of contract amount to cultivation groups since they could not obtain needed amount of loan from banks. ESOP has tried to obtain loans from Ghanaian banks. In fact, the cultivation groups of green beans have incurred loss of 82 million FCFA due to contract failures of a Burkinabe agribusiness enterprise. As such, problems in non-payments to the contract farmers have happened.

The law and rules regulating contract farming have not been yet enacted and the institutions in charge of managing and supervising contract farming have not yet designated. In addition to that, there is no contact institution to consult with this kind of problems.

(3) Role of Government and Preventive Measures from Side- Selling

The report of FAO states the following three (3) points as roles of the government, in addition to establishment of legal framework for organizing farmers and supports to farmers organizations.

- a) The government should establish legal framework at minimal level to function contract farming and enact appropriate laws regulating contract farming if possible.
- b) The government should formulate and disseminate models of contract agreements for major agricultural commodities and protect both rights of agribusiness enterprises and farmers by monitoring implementation of contracts.
- c) The government should facilitate agribusiness enterprises to introduce contract farming by setting up stimulating measures such as financial support, preferential tax system and others. The adequate price setting of agricultural land for investments may attract them to introduce contract farming.

It is necessary as pre-conditions for contract farming to develop and establish favorable environment by the government. In particular, enactment of legislation for contact failures, enforcement of legislation and establishment of legal procedures are essential. Then, the mechanism is necessary to restrain contact failures of agribusiness enterprises and contract farmers at minimal level in implementation of contract farming.

Up to now, the methods considered to cope with side-selling of farmers, which is the largest issue of contract farming, are stated below²⁴.

- a) Flexible purchasing price
- b) Assignment of technical extension staff in the field (monitoring)
- c) Utilization of group leaders and farmers groups in implementation of technical extension (monitoring)
- d) Adjustment and amendment of contents in contract agreements.

²³ Selling all of or some parts of the contracted products to third parties

²⁴ Carlos Arthur B. da Silva (2005) "THE GROWING ROLE OF CONTRACT FARMING IN AGRI-FOOD SYSTEMS DEVELOPMENT: DRIVERS, THEORY AND PRACTICE" Agricultural Management, Marketing and Finance Service, FAO.

- e) Enactment of legislation that regulates side-selling by buyers but not farmers.

In order to continue the contract, it is necessary for contractors (particularly for individual farmers) to understand that contract farming generates more benefits than other methods cannot make. Contract farming will be unsuccessful if both contractors are unable to establish mutual trust and deepen inter-dependence.

(4) Good Practices for Contract Farming

Good practices for contract farming through case studies for green beans and soybeans are summarized below. Good practice of ASK was collected during interviews on cowpea production

Table 2.4.14 Good Practices for Contract Farming

Item	Contents	Implementer
Guarantee of Technical Level	Cultivation groups are created only with farmers who reach to the required technical standards through provision of technical guidance.	ESOP
Purchasing Method	Buyers make a contract by the cultivation land and purchase all green beans produced in the contracted land. This motivates farmers groups to increase the production. The purchased green beans are screened and green beans below the standards are sold in local market.	Burkina Fresh
Purchasing Price	Incentive fees are paid to the excellent groups who follow full contract stipulations.	ESOP
Settlement Method	Settlement is made in cash at the time of delivery of agriculture commodity by groups.	ESOP
Land Use	Farmers are allowed to use freely a part of pump-up irrigated contract lands. Motor pump facilities are provided in advance and are arranged to be paid in installments (deducting from payments)	Burkina Fresh
Allocation of Production	Production quantity into famers in each group is determined through consultation with each farmer. (every farmer choose either single cropping or mixed cropping)	ESOP
Monitoring	After group leaders explain to the members about cultivation plan, two (2) field supervisors are assigned to each group for technical guidance.	NEB-nooma (green beans)
Adjustment of Production	According to the amount of production on the contract, unit area of cultivation is allocated. In case of lack of production, additional area is also prepared. The surplus in production quantity is sold to the other buyers. Since cowpeas are demanded in the market, it is easy to sell.	ASK (Cowpea Producers' Association)
Prevention of Side-selling	Soybean seeds are distributed to contract farmers more than contract amount for production. The contract farmers may use excess seeds and grow soybeans and then sell them to other buyers.	ESOP

Source: JICA team

2.4.4 Agricultural Finance

(1) Micro Finance

The commercial banks and bank affiliated non-bank financial institutions have sufficient capitals but tend to be affected by fluctuation of cotton price since they preponderantly invest in cotton industry²⁵. 20 branch offices per 1 million populations (4th ranking in WAEMU) are set up but most of the branch offices are concentrated in Ouagadougou and Bobo-Dioulasso. While there are a few number of branch offices in local cities and rural area, they prefer to provide short-term (1 or 2 years) loans to avoid default risks²⁶. In addition, financial institutions require collateral from 100% to 200% of loan amount. In the rural areas, many financial institutions do not accept property (land and building) as collateral due to the fact that land register system to conform property rights are not fully established²⁷. World Bank estimates that only about 26% of Burkina Faso population is able to access to financial

²⁵ Ministry of Economy and Finance (2012) "Strategie Nationale de Microfinance et Plan d'Action 2012 -2016". There were 12 commercial banks, 2 social insurance companies, 14 government financial funds, 5 non-bank financial institutions, 10 insurance companies, 1 postal finance company (SONAPOST), more than 280 micro finance and other types of financial institutions.

²⁶ OECD "Cadre d'Action por l'Investissement Agricole au Bukina Faso" (Mars 2011)

²⁷ Millennium Challenge Account (MCA) provides training on rural finance to commercial banks. Basic knowledge on agriculture (yield and costs) and methods to ensure profits in agricultural finance are trained.

services.

Under this circumstance, micro finance institutions (MFIs) play a vital role in financial services in the rural area. MFIs are defined as financial institutions to provide financial services to the low income poor who are difficult to access to commercial banks or cannot entirely access to commercial banks²⁸.

The main financial services of MFIs are savings, lending, money transfer and insurance. MFIs are regulated and supervised by “Direction de la Microfinance” in Ministry of Economy and Finance, and Central Bank of West African Countries’ (Banque Centrale des États de l’Afrique de l’Ouest: BCEAO)²⁹.

About 286 MFIs were registered in Ministry of Economy and Finance as of 31 of December 2010. The breakdown is shown below.

- a) 176 MFIs that have formed network as financial system for deployment in the rural area.
- b) 83 MFIs that have not formed network by itself.
- c) 4 MFIs that have become invalid in registration but have re-applied.
- d) 23 MFIs that have become invalid in registration and have not re-applied.

Out of registered 263 MFIs, most of MFIs are mutual financial associations and cooperatives, about 20 were limited company, limited liability companies, direct finance institutions and solidarity finance institutions. The total amount of savings was about 83.3 billion FCFA, the total amount of loans was about 79.4 billion FCFA and the total number of customer was about 1,136,285 people³⁰.

At present, there are 8 types of MFIs described below that provide micro finance in Burkina Faso³¹.

Table 2.4.15 Summary of Micro Finance Institutions

Type	Outline
1. Commercial bank affiliated Micro Finance Institutions	The banks provide micro finance through special counters for micro finance or by establishing subsidiary institutions. “Société de Financement de la Petite Entreprise (SOFIPE)” of Eco Bank is an example.
2. Mutual Financial Association and Financial Cooperative	About 73% of micro finance institutions are mutual/cooperatives. The “Réseau des Caisses Populaires du Burkina (RCPB)”, financial cooperative, is a good example.
3. Direct and Solidarity Lending Organizations	The main activities are lending based on principles of donors and NGOs. There are some cases that financial resources come from loans of commercial banks. For instance, “Société Burkinabé de MicroFinance (PAMF)” provides lending to individuals and groups by receiving supports from Aga Khan Foundation.
4. Limited Company (SA) and Limited Liability Company (SARL)	They are private companies that provide savings and lending services. They are sometimes managed by trading enterprises (taxation sector) or they conduct business receiving loans from the banks. For example, Micro finance PLUS SARL was established in 2008 and runs business in Banfora. Its financial resources come from Central Bank for West Africa Countries (BCEAO).
5. Autonomous Village Bank for Saving and Credit (CVECA) ³²	This is a financial institution that was established in 2002 by French NGO based on experience in Mali. The financial resources come from savings of villagers in community. Every village bank is managed independently by community. Its legal status is NGO. CVECA is the second largest micro finance institution following RCPB.
6. Government –Run Financial Funds	“Fonds d'Appui aux activités Rémunératrices des Femmes (FAARF)” for the poor women and “Fonds de l'Eau et de l'équipement Rural (FEER)” were established by government programs.

²⁸ Ministry of Economy and Finance (2012) “Strategie Nationale de Microfinance et Plan d’Action 2012 -2016”

²⁹ Micro finance institutes are regulated by law n°023-2009/AN of 14 May 2009 and financial institutions conducting activities in the rural area are regulated by law n°18-97/AN of 30 July 1997 and decree n°2009-839/PRES/PM/MEF of 18 December of 2009 of Ministry of Economy and Finance.

³⁰ Ministry of Economy and Finance (2012) “Strategie Nationale de Microfinance et Plan d’Action 2012 -2016”

³¹ Amended and added with information on Page 34 of “Burkina Faso’s Agriculture and Forestry” by JAICAF (March 2013).

³² Caisses Villageoises d’Epargne et Credit Autogerees

Type	Outline
7. Micro Finance Organizations at Specified Duration	These are created by some projects or NGOs as one of activities in order to achieve their objectives. Examples are Catholic Relief Services (CRS) and “Organisation Chrétienne de Secours et de Développement (CREDO)”
8. Savings and Credit Association (ROSCA)	ROSCA is a traditional solidarity lending system by residents in urban and rural areas, which is called “Tontines”.

Source: JICA team

(2) Case Study for Micro Finance Institution

Here, “Réseau des Caisses Populaires du Burkina” (RCPB), the largest micro finance institution in Burkina Faso, is taken as a case study. RCPB is a finance cooperative created in cooperation with Canada in 1972 for saving and lending of micro finance. RCPB has a national network (all 45 provinces) as of 2013 and 75% of the network are located in the rural area.

1) Structure of RCPB

RCPB is structured in 3 tiers: 1) “Caisses Populaires (CP)”, 2) RCPB Unions by region (4 unions - URCPC, URCPO, URCPN, URCPCE) and 3) “Fédération des Caisses Populaires du Burkina (FCPB)”. Each “Caisses Populaires (CP)” has 5 Points of Service (PoS).

The regions without RCPB regional unions are served by five (5) “Antennes Techniques” operated by FCPB, which provide essentially the same services to “Caisses Populaires (CP)” and points of service that the unions do.

Furthermore, RCPB has created “Caisse Villageoise (CV)” linking with “Caisses Populaires” located to close the village. “Caisse Villageoise (CV)” is formed by some of women’s groups (solidarity group). Each women group has five (5) members. “Caisse Villageoise (CV)” has provided financial services targeting women (described later).

FCPB has opened “Centre Financier aux Entrepreneurs (CFE)” jointly with larger “Caisses Populaires (CP)” as an advisory organ in order to examine larger loans and small- and medium-scale enterprises, and “Centres Financiers aux Agriculteurs(CFA)” in order to promote investments in the rural area in Ouagadougou, Koupela, Ouahigouya and Bobo-Dioulasso.

On the other hand, FCPB and other 5 financial cooperative fédération have created “Centre d’Innovation Financière (CIF)” to study, test and implement new financial services while sharing information with financial cooperative fédération in West African countries. Thereafter, CIF has been transformed to “Confédération des Institutions Financieres (CIF)” with other financial cooperative federations in the country. CIF has operated “Centre de Documentation” since June 2013.


2) Portfolio of RCPB and Agricultural Credit

RCPB are account for 25% of capitals, 30% of service points, 60% of borrowers, 80% of savings deposits and gross loans in all micro finance institutions as of 2010. The table below shows RCPB Portfolio in 2011³³.

³³ Mix Markets (<http://www.mixmarket.org/mfi/rcpb>) June 8 2013

Table 2.4.16 RCPB: Portfolio in 2011

Breakdown	Unit: USD
Gross Loan Portfolio	129.8 millions
Number of Active Borrowers	151,231
Average Loan Balance per Borrower	858.5
Deposits	167.4 millions
Assets	236.1 millions
Number of Depositors	852,149
Financial Resources	Concessional Fund and Savings



Caisse Populaire in Zinarié

Source: Mix Markets

Total outstanding agriculture loans are account for 22% of total outstanding RCPB loans as of 31 December 2011. The breakdown is shown in the table below³⁴.

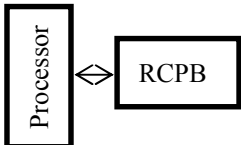
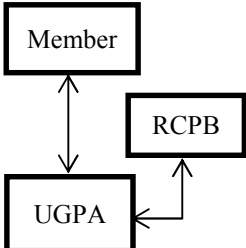
Table 2.4.17 Types of Agricultural Loans of RCPB

Financing Type	%
Agricultural production (Purchase capital of seeds, fertilizers etc.)	15.77%
Stock raising and fattening (Purchase capital of animals, chicks, feeds, etc.)	28.74%
Fruit and vegetable trade (Purchase capital of goods etc.)	3.12%
Grain storage and marketing (Warrantage-inventory credit-, etc.)	24.78%
Processing of agricultural products (Purchase capital of materials, etc.)	4.16%
Agricultural Investments (Purchase capital of agriculture inputs and oxen for animal traction)	3.33%
Agricultural market pre-financing (guarantee and lending based on purchase contract	0.19%
Cotton industry contribution	19.92%
	100.00%
<u>Total outstanding agricultural credit</u>	22.00%

Source: RCPB (2012) "Financing the Working Capital of Agricultural Enterprises: RCPB Experience"

As examples of agricultural finance, direct financing to dried mango processor and indirect financing to individual members through producers union (UGPA) are shown in the table below.

Table 2.4.18 Examples of Agricultural Loans by RCPB

Direct financing for Processor		Indirect Financing Producer Organization (UGPA)	
	Individual RCPB Member		1,000 + RCPB Member
	Dried Mango Processor		Grains production (collective sales)
	Working Capital: 60,000 USD		Working Capital: 1 million USD
	Term: 10 months		Term: 10 months
	Grace period: 7 months		Frequency: by sales
	Frequency: 3 repayments max.		Divided Lending: Progressive
	Guarantee: Mortgage + Purchase Contract + Equipment		Guarantee: Joint and several guarantees + purchase contract + guarantee fund

Source: RCPB (2012) "Financing the Working Capital of Agricultural Enterprises: RCPB Experience"

Although about 75% of the networks are located in the rural area, agricultural loans are account for 22% of total outstanding RCPB loans. Average size of loan amount is 858.5 USD and it is small scale.

³⁴ Presentation materials of "Financing the Working Capital of Agricultural Enterprises: RCPB Experience" presented by FCPB during UGANDA meeting in Kampala (Uganda) in 27 – 30 March, 2012.

3) RCPB Savings System³⁵

There are two saving schemes in RCPB: voluntary savings and compulsory savings. Summary of the saving schemes are shown in the two tables below.

Table 2.4.19 RCPB Voluntary Savings

	Sight Deposits	Term Deposits
Characteristics	Withdrawal any time	Blocked for 3 month period or more
Minimum amount in saving account	No	500,000 FCFA
Withdrawal fees	None	None
Account opening fees	500 FCFA (one membership share)	500 FCFA (one membership share)
Account maintenance fees	100 FCFA per month	100 FCFA per month
Interest rate paid	None	1.5% -2.5% payable at end of term

Source: World Bank (2007) "Financial Cooperative for Rural Finance: Case Study Burkina Faso's Caisses Populaires Network"

Table 2.4.20 RCPB Compulsory Savings

	Loan Guarantee Savings	Obligatory Savings (Salaried)
Characteristics	Savings blocked until the loan is repaid.	Savings blocked until the loan is repaid.
Minimum amount in saving account	15% of amount borrowed (lower rate for women)	2% of borrower's monthly salary (progressive rate up to 10% for housing loans)
Withdrawal fees	None	None
Account opening fees	500 FCFA (one membership share)	500 FCFA (one membership share)
Account maintenance fees	None	None
Interest rate	None	None

Source: World Bank (2007) "Financial Cooperative for Rural Finance: Case Study Burkina Faso's Caisses Populaires Network"

As such, RCPB is financial cooperative, so that account opening fees are recognized as membership fees and account maintenance fees are as monthly contribution.

4) RCPB³⁶ Financial Products

The financial products of RCPB are summarized in the table below. Nevertheless, loans for civil servants and private salaried employees as well as consumer loans (for instance, vehicle loans, housing loans and social loans) for concerned members (farmers and animal breeders) are excluded³⁷.

³⁵ World Bank (2007) "Financial Cooperative for Rural Finance: Case Study of Burkina Faso's Caisses Populaires Network"

³⁶ Information obtained in FCPB in June 2013.

³⁷ Loan conditions for civil servants and salaried private employees are eased because of lower credit risks.

Table 2.4.21 RCPB Financial Products

Borrower	Type of Credit	Repayment (month)	Ceiling (FCFA)	Rate (Year)	Security Deposit	Management Fee	Filing Fee (FCFA)	Penalty
Enterprises and Traders	Operating Capital Credit	12	5 millions	15%	15%	1% of advanced	≤ 500,000 = 2,000 FCFA 500,000 - 1,000,000 = 5,000 FCFA 1 million - 3 million = 10,000 FCFA 3 million - 5 million = 20,000 FCFA > 5 million = 30,000 FCFA	10% against delay repayment
	Equipment Credit	24		14%				
	Construction and Rental for Improvement	36		14%				
	Pre-financing for Contract	12		15%				
Farmers and Breeders	Input Credit	10		15%				
	Equipment credit (leasing)	24		14%				
	Construction and Rental for Improvement	36		14%				
	Animal Fattening Credit	10		14%				
	Breeding Credit	36		14%				
Mixed Groups (Men and Women)	Input Credit	10		15%				
	Operating Capital Credit	12		15%				
	Equipment credit (leasing)	24		14%				
	Construction and Rental for Improvement	36	14%					
	Animal Fattening Credit	10	15%					
	Breeding Credit	36	14%					
	Pre-financing for Contract	12	15%					
Women Specific	CV (village bank)	12	5 millions (150,000/pers)	10%	5% (3rd cycle)	1% of advanced	2,000 FCFA	
	ACI (Intermediate Credit Association)	12	5 millions (350,000/pers)	10%	10%			
	CFC (Female Trader Credit)	12	5 millions (500,000/pers)	13%	15%			

Source: Informations from Fédération des Caisses Populaires (FCPB)

Grace period can be extended up to about 12 months at most and repayment frequency differs by type of loans and borrowers. Seeing from examples of agricultural finance, guarantee deposits and purchase contracts are necessary in addition to collaterals such as property (buildings and land) and equipment by type of loans and borrowers. Also, frequency and way of repayment differ by type of loans and borrowers.

As stated in the table above, as typical loans of RCPB, there are 1) financial products for women groups who create “Caisse Villageoise (CV)”, 2) financial products for women groups who manage “Caisse Villageoise (CV)” (second generation of “Caisse Villageoise”) and 3) female trade credit (CFC) for income generating activities such as trading.

(3) Difficulties in Micro Finance

It can be pointed out four (4) difficulties in micro finance: 1) disproportional geographical distribution, 2) inconformity with needs, 3) insufficient financial services for agriculture and 4) lower soundness and sustainability.

With respect to disproportional geographical distribution of micro finance institutions in the country, they tend to concentrate in only several regions and provinces where business activities are so active, and there are physical disparities in the access depending on areas. So, rural areas are not efficiently covered. The largest difficulty for rural residents is that there is an absence of nearby micro finance institutions.

With respect to needs of residents in the rural area, procedures for micro finance are complicated, and most of them are designed for short-term finance. In addition, types and scope of financial products are limited. The special loan programs (education and health for instance) are sometimes set up in micro finance institutions by NGOs but are unable to fulfill all needs of residents in the rural area.

Agriculture has seasonal fluctuation of income and considerable risks. The major agricultural risks are

bad harvest due to unseasonable weather and outbreak of pests and diseases in addition to fluctuation of input and crop price. Therefore, micro finance institutions need to develop services and conditions to cope with such risks in agricultural loans. Above all, it is necessary to develop financial products that deal with longer repayment period, longer grace period and fewer frequencies of repayments because of the risks.

With respect to soundness and sustainability of micro finance institutions, there are many micro finance institutions which fail to collect and submit required information by the law to the authority. Financially sustainable micro finance institutions are rarely found. While micro finance institutions benefited from preferential interest rate from donors and NGOs, they did not realize sufficient profits. In this respect, lending programs with preferential interest rate in the rural area have prevented from sustainable growth of agricultural finance. Additionally, the illegal interest rate that is more than official interest rates (10 to 20% per year) becomes a problem.

As for gender issue, detailed data regarding sex are not available but there is no doubt that women are main beneficiaries for micro finance. It is indicated for women beneficiaries that major constrains are 1) lower level of knowledge on loans (complicated procedures), 2) difficulty of provision of collaterals, 3) lack of business management capacities and 4) inappropriate loan conditions. Particularly, it is pointed out that difficulties in repayments for women beneficiaries are resulted from the fact that short-term repayment period and frequency of repayments are not suited to needs of women.

2.5 Present Situation and Constraints of Export Structures and Systems

2.5.1 Foreign Trade Environment

(1) Foreign Trade Framework

Burkina Faso is a member state of UEMOA (West African Economic and Monetary Union) and ECOWAS (Economic Community of West African States). Economic integration has progressed in the region.

Based on ETLs (ECOWAS Trade Liberalization Scheme), intra-regional export of goods produced within the ECOWAS region is duty-free as a general rule.

In 2000, Burkina Faso adopted the UEMOA’s Common External Tariff (CET). CET has been expanded to the ECOWAS member states while Nigeria rejected the full adaptation of CET.

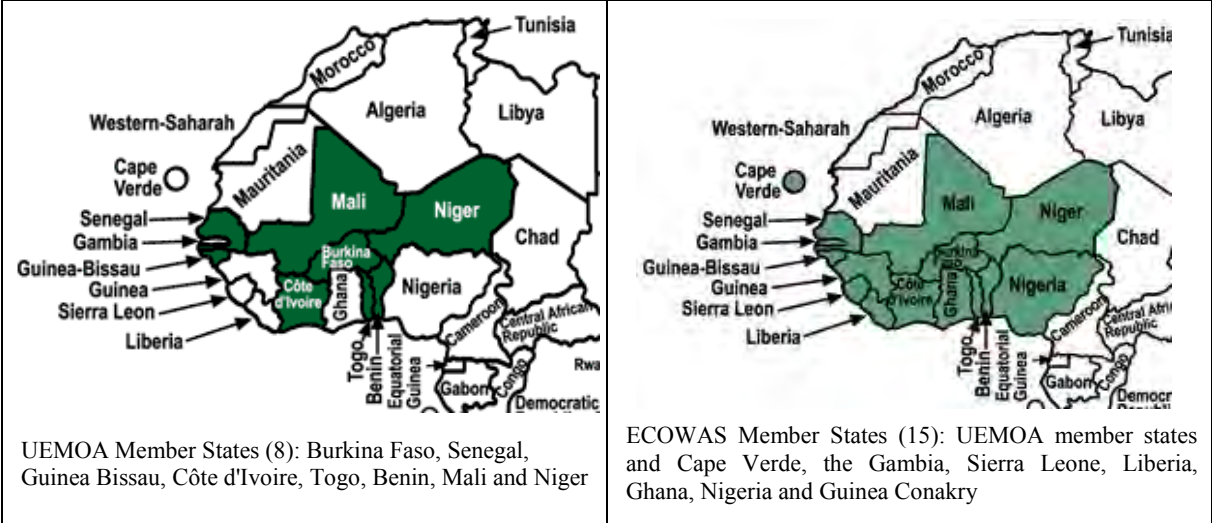


Fig. 2.5.1 Member States of UEMOA and ECOWAS

Source: World Bank

As for trading with non-sub-regional countries, Burkina Faso has adopted preference systems that support the improvement of market accesses, and made international agreements that aim at promoting the economic growth through trading as listed below. The impact of these preference measures, however, was limited and the share of imported goods from the developing countries to developed countries has been declining (DTIS, 2007).

- a) In 1970, UNCTAD reached an agreement on the framework of GSP (Generalized System of Preference)³⁸
- b) From 1975 to 2000, the first to fourth Lome Convention were concluded between European countries and ACP countries (Africa, the Caribbean and the Pacific countries). These agreements contain preferential tariff, financial and technical support from European Development Fund (EDF), support to industrialization, STABEX (Stabilization of Export Earnings System) and so on.
- c) In 2000, Cotonu Convention was concluded as a following trade agreement of Lome Conventions.
- d) In 2000, the United States enforced African Growth and Opportunity Act (AGOA). Under the AGOA, the number of duty-free imported items increased and the quantity limit was loosened.
- e) At the end of 2007, in consequence of the expiry of transitional measures from Lome Convention to EPA, the export to EU countries based on EBA (Everything but Arms) started. EBA is a system which allows LDC countries duty-free export of all items except for arms without the quantity limit.
- f) As of April 22, 2013, EU-West Africa EPA is under negotiation (Cote d'Ivoire and Ghana already reached the interim agreement).

(2) Transport

Burkina Faso is a landlocked country but it has the following four corridors as an important transportation hub in the West Africa.

- a) Abidjan corridor (Cote d'Ivoire): An historic corridor and the shortest export route from the southwest region. Railway transport is available between Kaya and Abidjan.
- b) Lome corridor (Togo): An old historic corridor just like Abidjan corridor.
- c) Tema corridor (Ghana): A corridor which was developed during the civil war in Cote d'Ivoire.
- d) Cotonu corridor (Benin): A corridor specialized in the import of oil and thus not adequate for ordinary trade.

Abidjan corridor was the most frequently used route before the civil war in Cote d'Ivoire but transaction shifted to Tema and Lome corridor during the civil war. Currently exporters choose export routes considering all factors such as cost, safety, effectiveness and so on.

³⁸ Japan currently applies special preference measures to Burkina Faso under the GSP scheme.

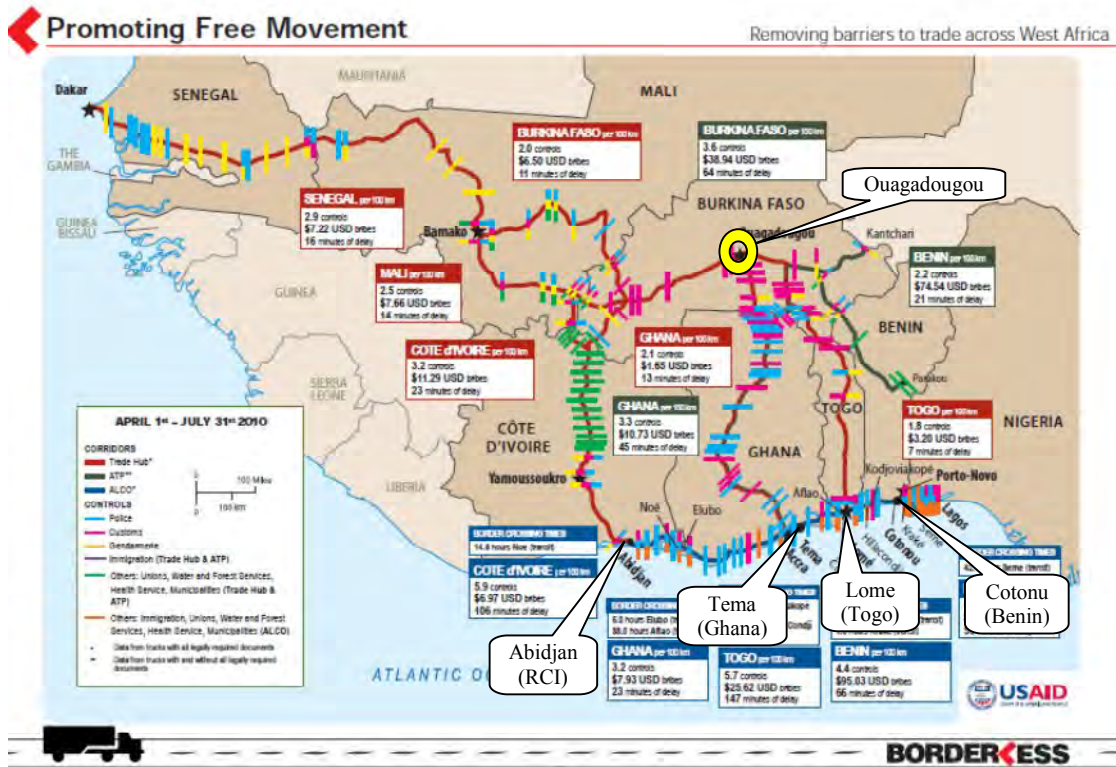


Fig. 2.5.2 Major Corridors of Burkina Faso

Source: USAID, Promoting the Free Movement of Transport, Goods & Persons the 2nd joint report on road harassment, 2010

2.5.2 Export Structures and Institutions

(1) Export Structures

Organizations engaged in export and promotion of agricultural products are listed below.

Table 2.5.1 Major Organizations Engaged in Export of Agricultural Products

Ministry of Commerce	In charge of planning, implementation and evaluation of trade policies and investment. <ul style="list-style-type: none"> General Directorate of Foreign Trade (DGCE): in charge of policies of foreign trade General Directorate of Internal Commerce (DGCI): in charge of domestic commerce General Directorate of Industry (DGI): in charge of planning of policy on industry and investment promotion, and Investment Code.
Ministry of Agriculture and Food Security	<ul style="list-style-type: none"> General Directorate of Promotion of Rural Economy (DGPER): in charge of promotion of distribution and export of agricultural products
Ministry of Finance	<ul style="list-style-type: none"> General Directorate of Customs
Agency of Export Promotion (APEX)	A public organization affiliated to Ministry of Commerce, and specialized in export promotion. It was reformed from ONAC (Office National du Commerce Extérieur) in 2011 and provides information of international markets and trainings.
Chamber of Commerce and Industry (CCI)	A public organization affiliated to Ministry of Commerce, representing interests of the private sector. It promotes business transaction, holds trade fairs, provides business facilities (storages, bonded warehouses and so on) and sells trade format (import/export declaration, certificate of origin, etc.)
MEBF (Maison de l'Entreprise du Burkina Faso)	An organization affiliated to CCI, established by donors such as World Bank in 2002 with a mission to provide business services. It provides support for documents for starting a business and registration, training on management and fund for business expansion including export development. Business Single Window (CEFORE) has been internally established.
Burkina Loaders Council (CBC)	A public organization providing support on marine/land/air/rail carriage. It provides information on supply-demand for transport through BNF (Bourse Nationale de Frêt).

Other than listed above, there are organizations which promote foreign/domestic investment; API (Agency for the Promotion of Foreign Investment) and ANPI (National Investment Promotion Agency). These organizations, however, do not function yet. As an advisory body for investment, Presidential Council for Investment (CPI) exists.

Some government officials mentioned that too many organizations are involved in export promotion and their roles and functions are overlapped. It is true that their legal roles are overlapped. APEX and DGPER are in charge of export promotion of agricultural products and APEX, CCI and MEBF are in charge of support for entry into international trade fairs, for examples. In practice, these organizations seem to divide their roles into sub-market levels. For example, CCI works to improve accesses to international market, DGPER works to promote exports for regional market and MEBF works for support of domestic enterprises. Ideally, APEX as an export promotion agency is expected to coordinate and lead activities of all organizations concerned but APEX does not function well. As a result, related organizations work individually without coordination, thus the promotion of Burkina products to the international market, which is the primary mission of APEX, is hardly conducted. One of the issues to be solved is to enhance the role of APEX to accomplish their task and coordinate related organizations.

Regarding financial support, MEBF provided funds for development of export potential (SUBEX: Subvention pour le développement du potentiel exportable) endowed by World Bank but the fund ran out in January of 2013. No fund for export promotion exists currently.

(2) Outline of Export Institutions

Thanks to ETLs (ECOWAS Trade Liberalization Scheme) introduced by the West African countries including Burkina Faso, integration of trade systems and unification of documents have been realized relatively smoothly. The region also introduced UEMOA-CET (Common External Tariff) and it basically eliminates all tariffs for intra-regional trade. In terms of tariff, the West Africa reaches “the most liberal level in Africa (DTIS, 2007)”.

The integration of customs system is also under progress and problems are hardly identified in the system except the language-barrier with English speaking countries like Ghana and Nigeria. In present, 90% of customs clearance is electronically proceeded (General Directorate of Customs).

Export Tax is put only on live animals in the agricultural category and other items are free from export tax. Other cost on export is only the statistic declaration fee (5,000 FCFA/declaration).

For the export of major cereals and pulse, the special authorization of export (ASE: Autorisation Spéciale d'Exportation) issued by DGCI of Ministry of Commerce is required. ASE system started with two objectives in 2008; taking precise statistic of export of cereal/pulse, and preventing severe outflows of food from the state (Food Security). The object products and export ban are determined by the inter-ministerial technical committee consisting of WFP, SONAGESS, DGPER and DGCI. Because important products in terms of food security become the object of the system, all kind of cereals and cowpea (niebe) are presently designated as the objects. Soybean and sesame are not the object because there is a little domestic demand for these products³⁹.

As integration of the trade systems and removal of the regional tariff are smoothly proceeded, the major problem for Burkina Faso is non-tariff barriers⁴⁰. DTIS indicates that procedure at the border and illegal intervention on cargo by police serves as barriers, which causes high ratio of indirect cost in the total transportation cost. The WATH (West Africa Trade Hub) report mentioned that ETLs has not fully practiced in the following four areas and trade barriers exist.

³⁹ Officers in the field, however, differently understand what products are object of ASE. This fact implies that information on the object products may be not fully circulated. Practically, maize export is often banned, the government official says.

⁴⁰ In the interview in Koudougou, people mentioned on bribes demanded by Customs officers at the border. USAID is carrying out the project to prove this matter but the project has not had distinct effect.

-
-
- a) Non-tariff barriers at borders and on transport routes: illegal check-points, bribes, purchase of ISRT Logbook at all borders, no return of bond money in the country of destination, document preparation (Brown Card, TRIE, etc.)
 - b) Improper charges for value-added goods: In ETLS protocols, goods with 30% value added are to enter duty free. However, in practice these goods are often charged duty.
 - c) Seasonal Restrictions: especially for maize.
 - d) Non-fulfillment of limitation on loading amount of trucks: ECOWAS protocols limit axle loads to 11.5 tons per axle.

JICA has dispatched several experts in Ouagadougou for smooth trade in UEMOA. They are engaging in activities for smooth customs clearance. As a result of the activities, it is expected that non-tariff barriers will be analyzed well based on reality.

(3) Customs Clearance

The facilities of Burkina Customs are managed by the Chamber of Commerce and Industries (CCI), which controls vehicles flow in and out, sells trade formats and so on⁴¹.

It is a general customs procedure in Burkina Faso that commercial goods pass the border as bonded transportation and goes through customs clearance in the big cities⁴². The largest customs post in Burkina Faso is Ouaga Inter in terms of both quantity and value⁴³, dealing with 40% of total national quantity, followed by the post of Bobo Dryport and Ouaga Airport. Of the posts at the borders, Bittou (border with Togo) and Dakola (border with Ghana, near Po) deal with more quantity.

Table 2.5.2 List of Customs Posts in Burkina Faso

(Cote d'Ivoire Border)	(Benin Border)	(Ouagadougou)
- Niangoloko	- Nadiagou	- Ouaga Inter (Ouaga Route)
- Kampti	(Niger Border)	- Ouaga Aéroport
(Ghana Border)	- Kantchari	- Ouaga Gare
- Ouesa	(Mali Border)	(Bobo-Dioulasso)
- Léo	- Koloko	- Bobo Port Sec
- Dakola	- Faramana	- Bobo-CAP (specialized in post)
- Zecco	- Djibasso	
(Togo Border)	- Thiou	
- Bittou		

Source: interview of General Directorate of Customs

Burkina Customs recognizes that improvements of customs procedures such as simplification of procedures and reduction of number of documents are necessary. Actually, improvement is under progress supported by UEMOA. On the other hand, exporters' complaint focuses on illegal charges of duty and road block, but not on export formalities. It is considered that exporters generally use customs clearance agencies so called "Maison de Transit" and exporters might not understand complicated procedures.

2.5.3 Systems of Standards, Quarantine and Quality Inspection

(1) Quality Standards

FASONORM (National Organization of Standardization of Burkina Faso; Organisme National de Normalisation du Burkina Faso) was established in 1998 as an internal department of ONAC (APEX

⁴¹ Other than Customs facilities, Chamber of Commerce and Industries manages two dry ports in Ouagadougou and one in Bobo-Dioulasso in cooperation with the French Bollere group.

⁴² Even at Bittou post, the largest border post, the number of export declaration is only 21 from January 1 to June 13 of 2013.

⁴³ Except for fuel oil. Fuel oil goes through customs clearance at the specialized Customs (Ouaga Hydrocarbure).

at the present) to investigate and promote quality standards in Burkina Faso. In accordance with National Quality Policy⁴⁴, FASONORM was merged with DGQM (General Directorate of Quality and Metrology; Direction Générale de la Qualité et de la Métrologie) of MICA and reformed into an independent organization called ABNORM (Burkina Agency of Standards, Metrology and Quality; Agence Burkinabé de la Normalisation, de la Métrologie et de la Qualité) in 2013, which mission is to supervises metrology and quality standard generally.

ABNORM is also an organization that determines national standards and as of May of 2013, 311 mandatory standards are already enforced. Of all, 196 standards are for agricultural products and foods (40 for vegetables and fruits, 45 for edible oils and 53 for cereals). All standards are established based on WTO rules. All check items in the standards can be examined by public laboratories in Burkina Faso.

ABNORM represents ISO in Burkina Faso but is not capable to inspect or certify ISO. There is a demand on ISO 9000 series and ISO 22000 from Burkina enterprises. Regarding HACCP, FASONORM provides basic trainings to enterprises and farmer's groups but doesn't give the certification.

In order to support acquisitions of Global GAP and organic certificates, FASONORM intends to provide private enterprises with trainings in cooperation with private certification bodies such as Ecocert, Lacon and Certysis.

FASONORM also has a plan to establish the Burkina Label system to guarantee the quality of products made in Burkina Faso. The Burkina Label guarantees that both the production process and the product itself meet the national standards. ABNORM is to certify the Burkina Label.

(2) Structures of SPS (Sanitary and Phytosanitary Inspection)

The following three organizations conduct phytosanitary inspection and analysis of food and agricultural products and each organization issues quality certificates⁴⁵. As of May 2013, only the phytosanitary inspection is obligatory for exported products and other certificates have not to be acquired for export.

Table 2.5.3 Organizations Conducting Phytosanitary Inspection and Analysis of Food and Agricultural Products

Organization	Activities
(Ministry of Agriculture and Food Security) DGPV-DPVC: Directorate of Plant Protection and Packaging (Direction de la Protection des Végétaux et du Conditionnement)	- Issue of phytosanitary certificate - In charge of phytosanitary control
(Ministry of Commerce) DGQM: General Directorate of Quality and Metrology (Direction Générale de la Qualité et de la Métrologie)	- Issue of CNC (National Conformity Certificate) - In charge of inspection of standards of processed food. DGQM used to conduct inspection at Customs but this operation has been suspended.
(Ministry of Health) LNSP: National Laboratory of Public Health (Laboratoire National de Santé Publique)	- Issue of CCS (Sanitary Control Certificate) - In charge of sanitary inspection of domestically distributed foods and of food processing facilities.

In addition to above organizations, there is a following laboratory capable of quality inspection.

⁴⁴ The SNE (National Strategy for Export) also mentioned on independence and reinforcement of FASONORM.

⁴⁵ Regarding livestock products and live animals, DGSV (Directorate General of Veterinary Services) of Ministry of Animal Resources is responsible for sanitary inspection.

Table 2.5.4 Organizations Capable of Quality Inspection

Organization	Activities
IRSAT-DTA: Research Institute of Applied Science and Technology (Institut de Recherche en Sciences Appliquées et Technologies - Département Technologie Alimentaire)	The most appointed laboratory of all public labs. The unique lab holding the international laboratory accreditation (ISO17025) in Burkina Faso.

Details of organizations are described as below.

1) DGPV-DPVC: Directorate of Plant Protection and Packaging (Direction de la Protection des Végétaux et du Conditionnement)

DPVC is a department responsible for phytosanitary inspection of imported/exported plants and agricultural products and issue of phytosanitary certificates (inspection note and phytosanitary inspection report). The certificate can be issued on the same day or in advance at the all phytosanitary control posts⁴⁶.

There are three sections in DPVC: SI (Service of Interventions), SCPQ (Service of Control Phytosanitary and quality) and SP (Service of Pesticides). The 18 phytosanitary control posts in Burkina Faso are managed by SCPQ. SCPQ is a small section in which only three staffs including the section chief are working.

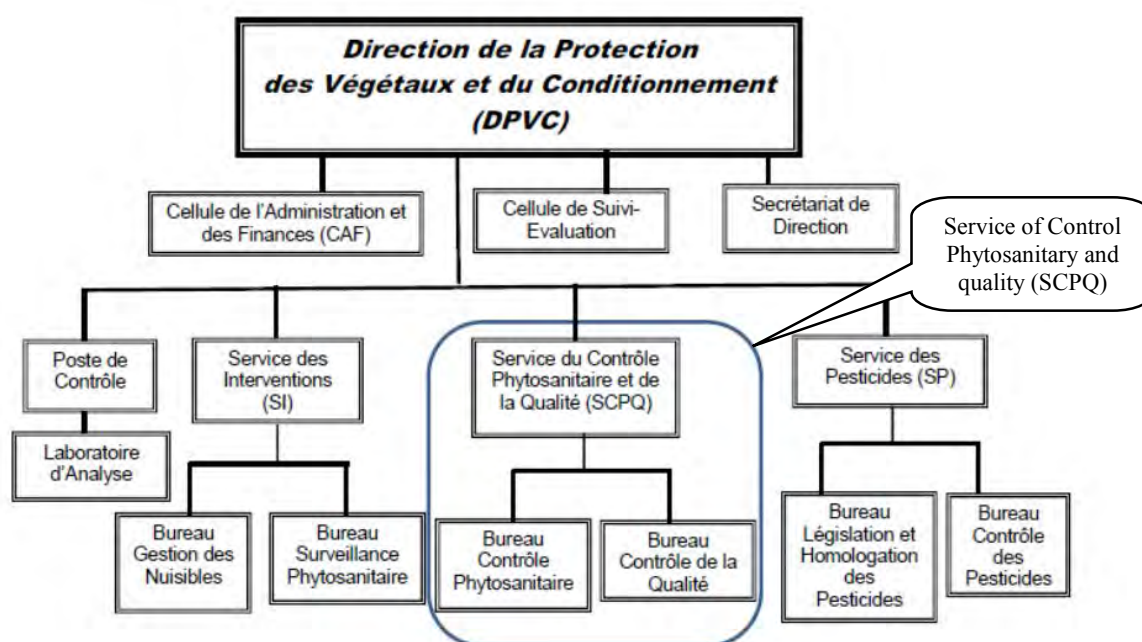


Fig. 2.5.3 Organization Chart of DPVC (Direction de la Protection des Végétaux et du Conditionnement)

DPVC conducts phytosanitary inspection, placing the following 18 phytosanitary control posts at the large cities and the borders. Two or three quarantine officers are assigned in each post. Although there is no phytosanitary control post at the largest Customs, Ouaga Inter, there is a plan to establish a new post in Ouagadougou as well as Cinkanse at the border with Ghana.

⁴⁶ When the inspection incapable at the border post is necessary, the freight is suspended at the border post until the inspection in Ouagadougou finishes.

Table 2.5.5 List of Phytosanitary Control Posts

(Cote d'Ivoire Border) - Niangoloko - Kampti	(Benin Border) - Nadiagou (Niger Border) - Kantchari	(Airport) - Ouagadougou (Ouaga Aéroport)
(Ghana Border) - Ouesa - Léo - Dakola - Zecco - Bittou	(Mali Border) - Koloko - Faramana - Djibasso - Thiou	(Railway station) - Ouaga Gare - Bobo Gare 1 - Bobo Port Sec (the former Bobo Gare 2)
(Togo Border) - Bittou		(Central post) - Bobo-Dioulasso (Bobo centre)

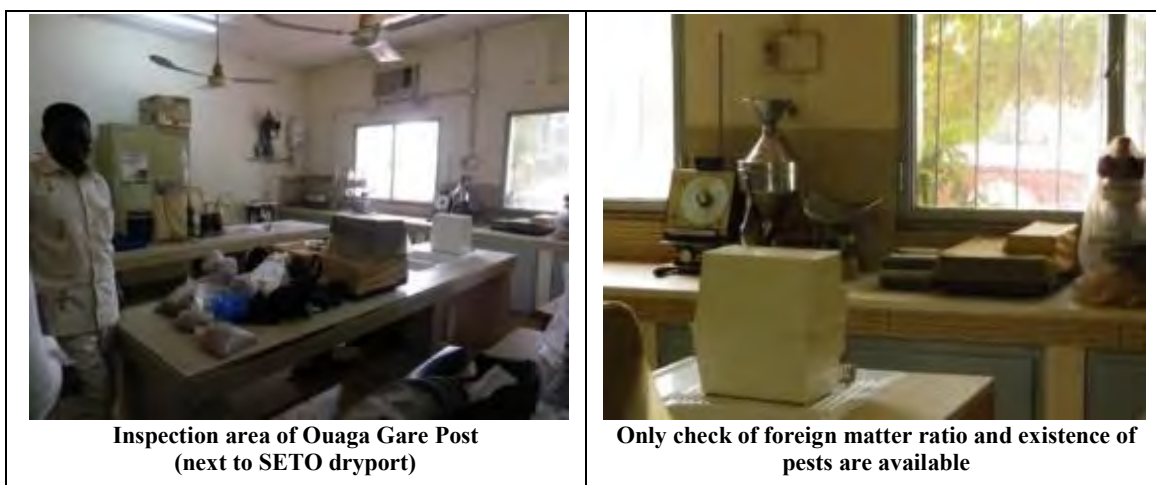
* Bittou post overlaps in border with Ghana and with Togo

Source: IPPC data modified with interview

http://www.ippc.int/index.php?id=1110879&tx_legislation_pi1%5bshowUId%5d=185996&frompage=247&type=legislation&subtype=&L=0#item

The following four posts have larger amount of transit than others; Bittou (border with Ghana and Togo), Niangoloko (border with Cote d'Ivoire), Dakola (border with Ghana) and Bobo dry port (Bobo-Dioulasso). The Control posts are basically capable of visual inspection only. When additional inspection or analysis is necessary, the border post sends samples to LNSP or IRSAT-DTA in Ouagadougou. DPVC recognizes that it is a problem that no well-appointed post exists in Ouagadougou. They have a plan to establish new posts with modern equipments but it has not been realized.

No phytosanitary control post holds the international laboratory accreditation although UEMOA program supported DPVC to acquire ISO17020.



Inspection area of Ouaga Gare Post (next to SETO dryport)

Only check of foreign matter ratio and existence of pests are available

Phytosanitary controls at the borders are incompletely conducted. The cooperation with Customs doesn't work well and some freight passes the border without phytosanitary inspection. Currently, electronic systems are not introduced into the phytosanitary procedures but will be involved into the SYLVIE⁴⁷ (an integrated e-system to provide information of trade procedures) which the Customs offices apply.

DPVC has no research section and then no research on pests and diseases is conducted, for which the INERA is responsible. Therefore, DPVC is not engaged in the research of vapor heat treatment which is mandatory for the export of fresh mangoes to the United States, Japan and other countries. It is unconfirmed whether the INERA does research in this area.

⁴⁷ Systeme de Liaison Virtuelle des Importation et Exportation

DPVC accumulates the data of interception (the annual number of interception and its reason) of Burkina agricultural products in EU because EU authority sends notice to DPVC in case of interception. DPVC is not, however, active in collecting information on phytosanitary requirement of new potential countries for Burkina products.

2) DGQM: General Directorate of Quality and Metrology (Direction Générale de la Qualité et de la Métrologie)

DGQM is responsible for quality standards and compliance of metrology. DGQM's task is to monitor standards of commodities domestically distributed and commercial goods passing Customs (but agricultural products are monitored by DPVC), and issues CNC (National Conformity Certificate).

DGQM was separated from IGAE (Inspection Générale des Affaires Economiques) and reformed into the General Directorate in 2011. And then in 2013, ABNORM was established by merging DGQM and FASONORM.

DGQM doesn't do regular surveillance over commodities domestically distributed but does analysis corresponding to consumers' claim⁴⁸.

Surveillance over commercial goods passing Customs is one of the DPVC's tasks but this task has been suspended as a part of simplification of Customs procedures under the Strategy for Improvement of Business Environment. Theoretically, both goods domestically distributed and exported should be checked by DGQM but practically, acquiring CNC is not currently obligatory for export products.

DGQM has two laboratories; one for metrology and the other for quality analysis in Ouagadougou but their scale is very small. The metrology lab tried to acquire the international lab accreditation with support of UEMOA but failed.

Examples of available analysis in the DGQM lab are, for edible oil, moisture, purity, dioxide, iodine, saponification, acid, volatility and so on.



Lab of Quality Analysis in DGQM



Analysis of edible oil

3) LNSP: National Laboratory of Public Health (Laboratoire National de Santé Publique)

LNSP is a laboratory for sanitary inspection of food under the Ministry of Health and responsible for sanitary inspection of food processing facilities and food domestically distributed, and issue of CCS (Sanitary Control Certificate). LNSP is authorized in compulsory sanitary inspection.

⁴⁸ Problems are often found in edible oil (cotton seed oil) and mineral water in sack.

LNSP's sanitary inspection is obligatory for goods domestically distributed but there is no law or regulation which obliges sanitary inspection on exported products. LNSP provides analysis services for exported goods at enterprise's request⁴⁹.

LNSP has the four bureaux; two in Ouagadougou (Ouaga Inter and Ouaga Gare), one in Bittou, one in Bobo-Dioulasso. The bureau in Bobo has a small lab specialized in analysis of drinking water but other bureaux don't have labs. Therefore, the bureaux without labs collect samples and send them to the headquarter in Ouagadougou to make analysis.

The lab in Ouagadougou is capable of detection of salmonella, aflatoxin, and chemical residue of agricultural chemicals. The LNSP lab consists of two analysis sections of mycotoxin analysis and pesticide residue and both sections are trying to acquire ISO17025⁵⁰.

4) IRSAT-DTA: Research Institute of Applied Science and Technology (Institut de Recherche en Sciences Appliquées et Technologies - Département Technologie Alimente)

IRSAT-DTA was established in 1997 under CNRSP (Centre National de la Recherche Scientifique et Technologique) and its mission is to improve the quality of Burkina agricultural products (including livestock and forestry products). IRSAT-DTA consists of microorganism lab, physical chemistry lab, sensory test section and training section. Unlike LNSP, IRSAT-DTA is not authorized to do compulsory inspection. It provides services of quality analysis and trainings corresponding to enterprises' wishes.

Unlike other organizations, the mission of IRSAT-DTA is to provide not only inspection but also trainings on the quality improvement. They can provide wide range of trainings such as processing techniques (threshing method, making of cuscus and cookie, etc.), quality management (general ideas of HACCP, etc.), sterilization methods and packaging of food.

Other than Ouagadougou, IRSAT-DTA has a microorganism lab in Bobo-Dioulasso. The training facilities exist only in Ouagadougou.

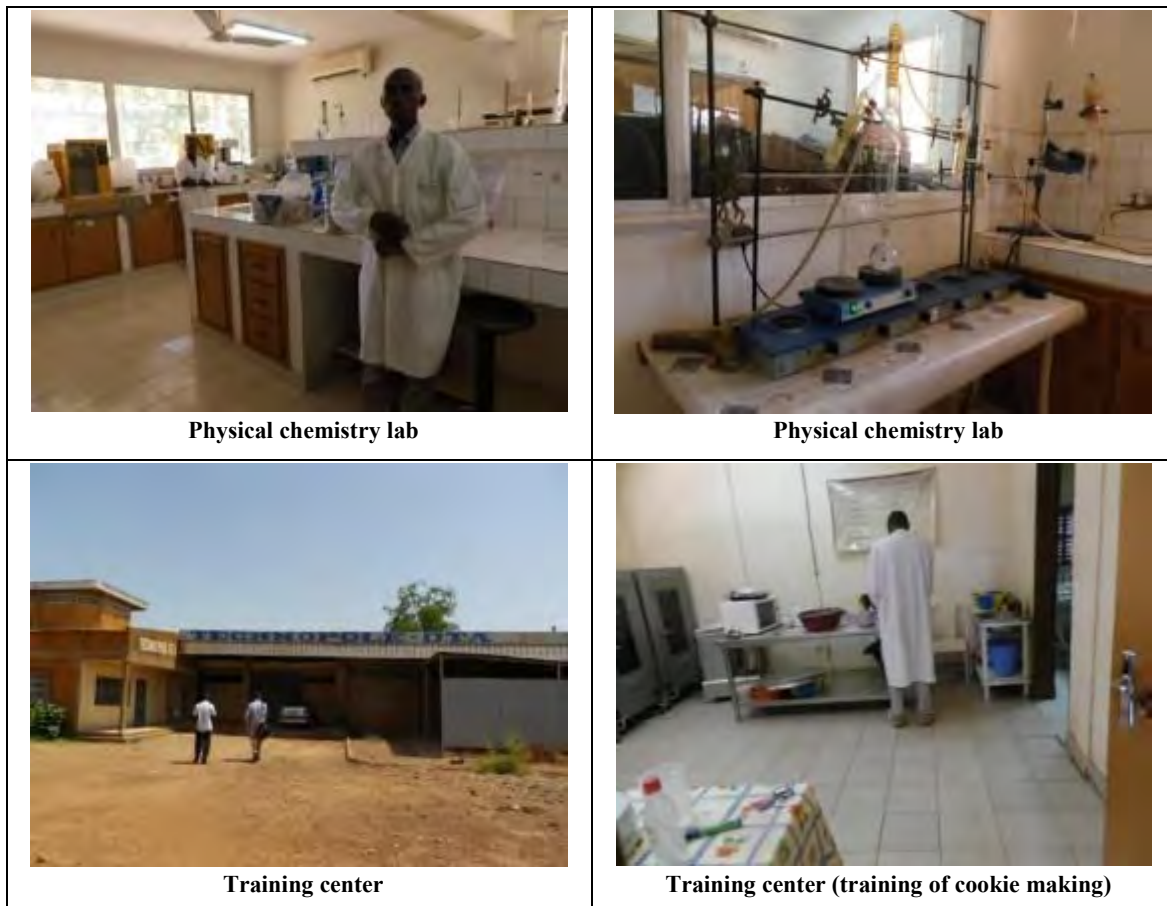
IRSAT-DTA is capable of analysis of salmonella but incapable of aflatoxin and chemical residue. Each lab is allocated with two or three inspectors and a few university interns. The microorganism lab became the first public lab accredited with ISO17025 in Burkina Faso, getting the support of UEMOA⁵¹.



⁴⁹ There is a large demand on inspection of salmonella of sesame. Inconformity of quality standards are often found in aflatoxin test, which LNSP considers as a big problem. On the contrary, Japanese importers of Burkina sesame are keen to inspect pesticide residue.

⁵⁰ Using a French certification company, COFRAC

⁵¹ Accredited by a French certification company, COFRAC. The physical chemistry lab is also preparing to acquire ISO.



(3) Private Inspection Companies

There are several private inspection companies in Burkina Faso. Some buyers designate these private companies because the capacity of governmental labs is not fully reliable. For example, Group Velegda that delivers niebe (cowpea) to the Red Cross, WFP and SONAGESS usually get instruction to inspect moisture, chemical and GMO in IRSAT-DTA, SGS or GRINO.

(4) Current Situation of Phytosanitary Control and Quality Inspection

The following table shows allocation of the phytosanitary posts and inspection bureaus. The phytosanitary control posts in charge of inspection on both imported and exported goods are widely placed in the cities and at the borders and the inspection structure is well established. Few posts, however, are well-appointed and one of their big problems is the absence of lab with adequate equipments in Ouagadougou, where a lot of commercial goods come and go.

In addition, phytosanitary inspection system is not fully functioning and therefore some freight pass the border without phytosanitary check due to lack of cooperation between Customs and phytosanitary control posts.

A difficulty is also found in the capability of phytosanitary inspectors. For instance, the EU phytosanitary control service has detected the contamination of fruit flies in Burkina mangoes five or six times annually even though all the mangoes were shipped with Burkina phytosanitary certificates.

Table 2.5.6 Allocation of Inspection Posts and Laboratories (as of May 2013)

Organization	Inspection of Imported goods	Inspection of Exported goods	Inspection Posts and Laboratories							
			Ouagadougou	Bobo-Dioulasso	Border with Cote d'Ivoire	Border with Ghana	Border with Togo	Border with Benin	Border with Niger	Border with Mali
DGPV	obligatory	obligatory	Ouaga Aéroport Ouaga Gare	Bobo centre Bobo Gare 1 Bobo Port Sec	Niangoloko Kampiti	Ouesa Léo Dakola Zecco (Bitou*)	Bitou	Nadiagou	Kantchari	Koloko Faramana Djibasso Thiou
DGQM	To be obligatory	To be obligatory	■ Ouaga							
LNSP	obligatory	voluntary	● Ouaga HQ Ouaga Inter Ouaga Gare	■ Bobo		(Bitou)	Bitou			
IRSAT-DTA	voluntary	voluntary	● Ouaga	● Bobo						
● with lab ■ with small lab										

Unlike the phytosanitary posts, LNSP and IRSAT-DTA have less numbers of branches and they are concentrated in Ouagadougou and Bobo-Dioulasso. It is reasonable when considering the fact that the quality inspection of exported goods is not mandatory, and declaration of exporting goods, which buyers require quality inspection for, for the international market is submitted in the big cities.

Some people suspect the ability of public laboratories and it is difficult to say that the quality certificates issued by the public laboratories guarantee the safety of exported goods.

It is important that the safety and quality of commercial goods to developed countries are ensured by the reliable third party. Recently, aflatoxin, salmonella and chemical residue have become big problems on the food safety. If the reliability of inspection conducted by the public labs is enhanced, exporters don't need to send samples abroad through private inspection companies, which allow them to reduce cost.

As EU countries import a lot of food from African countries, they already start to work on this issue. EDES, an organization working for ensuring the safety of food imported from ACP countries, is implementing "Program on reinforcement of system of sanitary security of food in Burkina Faso (Programme de renforcement du Système de Sécurité Sanitaire des aliments au Burkina Faso)" from 2011. In this program, phytosanitary inspectors of airport in France are placed in Burkina Faso to give technical instructions to Burkina inspectors.

2.5.4 Certification Systems

In Burkina Faso, it is possible to obtain European organic certificate, Global Gap and Fair Trade certificate through private certificate bodies. The JICA team confirmed the following certification

companies; Ecocert (France), Lacon (German), CERTISYS (Belgium), TÜV NORD INTEGRA (Belgium) and ICEA (Italy). Of them, only Ecocert have the permanent office and staff in Burkina Faso.

(1) Ecocert

Ecocert Burkina Faso has 10 inspectors covering 24 countries in West Africa. They inspect and proceed to give the organic certificates (European organic, USA NOP, Japanese organic JAS, Korean organic), Global GAP and Fair Trade, and also provide trainings on certification. In the West African region, about 90 organic certificates, 20 fair-trade certificates and 15 Global GAP (mainly for mangoes) are obtained. Demand is bigger for organic certificate than for Global Gap⁵². 90% of organic certificates are obtained by exporters and single certificate guarantees the process from production to export. In 2012, about 10 clients stopped to renew the certificates because of absence of market.

There are about 30 clients in Burkina Faso and as of June of 2013, 19 of EU organic certificates are valid (see the table below). The cost to obtain a certificate is estimated in range of 1,200 – 10,000 Euros (including travel cost) while it differs by the number of farmers to be certified, type of products, existence of processing operation and so on.

Table 2.5.7 Holders of Organic Certificate in Burkina Faso (as of June 2013)

Standard	Certification Number	Operation's Name	Products Produced	Certification Status	Category of Products	Operator status
834/2007 or EOS	5554BF	Agroburkina	Mangoes	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	22116BF	APSERN (Association des producteurs de la Sissilli pour l'eco gestion des ressources naturelles)	Soja	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	7644BF	Belwet industrie	Balanites oil	Organic	Production of processed food	Certified
834/2007 or EOS	6006BF	Burkarina	Shea butter	Organic	Production of processed food	Certified
834/2007 or EOS	389BF	Burkinature sarl	Fresh and dried mangoes, mango puree	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	389BF-50	Burkinature sarl	Dried pineapple, shea butter	Organic	Processed plant production	Certified
834/2007 or EOS	398BF	CDS	Mangoes	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	398BF-50	CDS	Hibiscus	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	1835BF-50	Coopake	Dried Hibiscus	Organic	Production of processed food	Certified
834/2007 or EOS	1658BF	Cpbk-b	Shea butter, almond	Organic	Production of processed food	Certified
834/2007 or EOS	5500BF	Fédération Nununa	Shea butter	Organic	Production of processed food	Certified
834/2007 or EOS	5038BF	Gaia bio solidaire	Fonio fully husked, sorghum, tef	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	6843BF	Gie naffa	Dried and Fresh Mangoes	Organic	Production of processed food	Certified
834/2007 or EOS	7343BF	Groupement feminin gnogondeme de yona	Shea butter	Organic	Production of processed food	Certified

⁵² Global Gap is for fresh products and not includes processed products. Therefore, the organic certificate is preferred that covers more various products.

Standard	Certification Number	Operation's Name	Products Produced	Certification Status	Category of Products	Operator status
834/2007 or EOS	19051BF	Groupement Mixte Sanlé Séchage des Fruits et Légumes	Cashew almond, fresh and dried mango, dried hibiscus, dried ginger	Organic	Unprocessed plant productions	Certified
834/2007 or EOS	11170BF	Selkis Crops	Shea butter	Organic	Production of processed food	Certified
834/2007 or EOS	5842BF	Sotokacc	Shea butter	Organic	Production of processed food	Certified
834/2007 or EOS	9013BF	Unaproka	Shea butter	Organic	Production of processed food	Certified
834/2007 or EOS	1941BF-50	Wouol de beregadougou	Dried hibiscus, ginger, dried ginger	Organic	Production of processed food	Certified

Source: extracted Burkina organizations from data given by Ecocert

(2) LACON

LACON is a private certification body of Germany and is mainly engaged in inspection and procedure of BIO (Germany organic certificate) in Burkina Faso. Evaluation and issue of the certificate are done by the headquarters in German. There are two types of certificate; for producers and for packers. There are no permanent office or staff but two part-time inspectors; one in Ouagadougou and the other in Banfora. There are six holders of BIO in Burkina Faso but one of the holders, AFRA, stopped to renew it because it failed to gain a new customer. There is a demand on acquisition of certificate but its high cost to obtain is a big burden to the holders.

Table 2.5.8 Holders of BIO Certificate

Name	Location	Certified crops
Agrifaso	Bobo-Dioulasso	Shea, Bissap
UAB	Gassan	Green bean
ARFA	Fada-N'Grouma	Sesame
FASOBIO	Bobo-Dioulasso	Mango
Biomega	-	Baobab, Bissap
UCPA/BM	Dédougou	Bissap

Source: interview to inspector of Lacon

2.5.5 Infrastructures of Market and Foreign Trade

(1) Market Infrastructure

In the support of World Bank, PAFASP, a wholesale market specialized in transaction of fresh fruits and vegetables (Marchè de Fruits et Légumes) was constructed in Bobo-Dioulasso in 2010. The same types of the market facilities are being constructed in Orodara and Banfora. The market is managed by the committee consisting of City Hall and producers/traders' associations.



Fruits and vegetable wholesale market in Bobo-Dioulasso (including retail section)



Mangoes exported to the neighboring countries (e.g. Niger and Algeria)

Along with the wholesale markets, collection markets for transaction of certain vegetables⁵³ in the production area, called “Comptoir” (meaning “counter” in English), are also constructed. PAFASP planned to construct six Comptoirs⁵⁴ in the state but as of May of 2013, only Comptoir in Koudougou is operated, where is specialized in domestic and regional trade of onion. In the production areas surrounding a Comptoir, several collection centers are to be placed like satellites⁵⁵.

As the Comptoir is supposed to be managed by the local producers/traders associations, existence of association is one of the determinants of the location of Comptoir. All construction cost are borne by PAFASP.

PAFASP also supported to construct a wholesale market facility for vegetables in Ouahigouya, called “Platform”, but it is not in operation yet. The function of Platform is same with Comptoir, and it has selection areas, work areas, storages and shops. According to PAFASP, the large Comptoir that functions as the hub of surrounding collection centers is called Platform.



Comptoir in Koudougou



The place is filled with onion in the season

⁵³ The plan indicates the trade of onion, tomato and potato.

⁵⁴ The proposed sites other than Koudougou are; Korsimoro (near Kaya), Niamssa (in Sourou), Yako, Ouahigouya, Mogtedo (near Koupela).

⁵⁵ For example, for Comptoir in Koudougou, the collection centers will be constructed in Tita, Tenado, Reo and Kyon.



Platform in Ouahigouya

Working area

Regarding the existing market facilities, the public market places for cereals are placed across the country; 19 collection markets (Collecte) managed by collectors, seven wholesale markets (Regroupment) managed by local governments and 21 retail markets (Détail) managed by local government. However, most of these marketplaces do not have many facilities and are not in good conditions.



Wholesale market in Leo

(2) Infrastructure for Foreign Trade

CCI possesses some facilities for foreign trade such as dryports and bonded warehouses in the country and neighboring port countries⁵⁶. CCI possesses warehouses and handling areas in the four major ports; Abidjan (Cote d'Ivoire), Tema (Ghana), Lome (Togo) and Cotonu (Benin).

The Abidjan port was the most frequently used for Burkina exporters before the civil war in Cote d'Ivoire but the shipment through Tema and Lome ports increased during the civil war. In present, exporters choose the port considering the efficiency, safety and cost⁵⁷. When prioritizing the safety, it is better to containerize products in Burkina Faso, but it is more costly than loading them in the port countries. In Bobo dryport, exporters sometimes have to wait for their turn because of limited number of containers.

2.5.6 Constraints of Export Structures and Institutions

The export from Burkina Faso enjoys the preferential tariff system given by the developed countries like Japan, EU countries and the United States. CET (Common External Tariff) is applied without any troubles and Custom clearance is relatively smooth. Currently serious tariff-barriers don't exist in Burkina Faso. The problems are the weak governmental structure for export promotion and the non-tariff barriers.

⁵⁶ Some facilities are managed with SDV affiliated to Bollere Group of France.

⁵⁷ In the case of an exporter of sesame in Bobo-Dioulasso, they ships 20% of products through Abidjan, 40% through Tema and 20% through Lome.

(1) Structures for Export Promotion

APEX is an organization specialized in export promotion but it has little achievement so far. Burkina exporters hardly mention interventions or supports of APEX in the interview. NSE (National Strategy of Exports) designates APEX as the implementation body of the four pilot projects but only the sesame filiere project started with the support of GIZ as of June 2013.

Other than APEX, several organizations such as CCI, MEBF and MARHASA-DGPER are involved in export promotion of agricultural products and some people point out that their roles are overlapped. The fact is that other organizations complement APEX's activities. CCI has worked for advertisement in the international market, MEBF for management of the fund for export promotion and DGPER for promotion of agricultural products in the regional market.

Enhancement of APEX is crucial to realize the consistent activities for export promotion. The capacity building of APEX, however, requires huge input and time. First, it seems better to train APEX through OJT method in order to promote a specific product. Also it is desirable to ask organizations experienced in the promotion of the product to cooperate with them. The series of the concrete activities could be;

- Selection of the target products (It is desirable to choose a product which is not selected in the SNE pilot projects.)
- Value chain study of the target product (production, processing, distribution, market demand, etc.).
- Selection of concrete activity plans to increase export (improvement of productivity, processing skill, quality management, market infrastructure, publicity of the product, etc.)
- Specification of individual actions to implement the activity plans and planning of budget.
- Narrowing the activity plans considering the feasibility and making proposal for budget application.
- Application of budget/Seeking of donors
- Implementation of activity, monitoring and follow-up

(2) Capacity of Phytosanitary Control and Quality Inspection

There is room for improvement of DPVC in terms of inspection skills as well as lab facilities. In aspect of skill, there is a problem that the Burkina phytosanitary control service incompletely examines the existence of pests. For instance, five or six shipments of Burkina mangoes fail to pass the censorship per year due to contamination of fruit fly. This is a big failure that causes a serious loss to the exporters and prompt improvements are essential.

In aspect of facilities, few phytosanitary control posts in 18 posts are well appointed. Even the post in Ouagadougou with large quantity of freight doesn't have enough equipment.

Capacity building of phytosanitary inspectors was involved in the EU's EDES program, which terminated the first phase in 2013. No equipment was granted in this program.

In Burkina Faso, the technique of vapor heat treatment is not established, so it is impossible to export mangoes to the countries that require the vapor heat treatment of imported mangoes such as Japan and the United States. Therefore, Burkina Faso has to find a country which doesn't require the treatment in order to expand the export of mangoes. DPVC, however, doesn't collect this kind of information.

It is unrealistic to establish the technique of vapor heat treatment in Burkina Faso considering the structure of DPVC (there is no section of research), necessary equipments, human resources and period.

(3) Guarantee of Quality of Exported Products

In the case of export of foods to the developed countries, it is important to certify the quality and safety of the product by a reliable third party. There are some challenges as follows in terms of the quality of exported products.

Mandatory Inspection of Exported Goods: Burkina food standards are determined based on the international standards such as ISO and CODEX. Quality inspection, however, is obliged only to imported products and commodities domestically distributed, not to the exported goods. Some sesame exporters insist that Burkina authority should obligate the inspection so as to ensure the quality control of sesame for export.

Capacity of public laboratories: There are two public laboratories capable of quality inspection of food, namely LNSP and IRSAT-DTA. These labs enhanced the ability of analysis and received the equipment under the UEMOA Quality Program. Both labs are capable of the inspection of aflatoxin and salmonella, and LNSP is capable of the inspection of chemical residue.

Certification: Other than the quality inspection, certification can also guarantee the quality of exported food. For the export of fresh products to EU, obtaining of Global GAP is necessary but the cost of acquisition is extremely high.

(4) Development of Infrastructure for Foreign Trade

The facilities for the international trade such as warehouses and dry ports are relatively well prepared and there seems to be no serious problem. On the other hand, the facilities for the regional market are not developed. Most transactions take place in open spaces except a few wholesale markets constructed by PAFASP, a project of World Bank.

2.6 Situation of Donor Supports

Many assistance agencies are implementing projects in Burkina Faso at present. Outlines of situation of the assistance by major agencies regarding agricultural development are mentioned in this chapter. Situations of the assistance regarding target crops of the Project are mentioned in the chapters of each agricultural products; chapter 6 or later.

Technical assistance for whole VCs from production to trade (including export) is major in agricultural development sector as well as assistance for food security. There are projects which provide integrated supports including capacity development of organizations regarding the VCs, infrastructure development, improvement of business environment etc. The target products are cash products such as livestock, vegetables, fruits and oilseed crops as well as subsistence crops such as cereals, beans and tubers.

2.6.1 Multilateral Development Assistance

(1) World Bank

1) Agriculture, Forestry and Livestock Value Chains Support Program (Programme d'appui aux filières agro-sylvo-pastorales: PAFASP)

PAFASP was started as a 6 years program from December 2006 with a loan of the World Bank. However, its implementation period was expanded till 2014. Furthermore, the second phase has been implemented till 2016. The budget is 84.5 million USD and 66 million USD of the budget is financed by World Bank.

The objectives are improving competitiveness of products produced through the VCs in domestic, sub-regional and international markets and contributing to growth of the VCs. The detailed goals

are 1) capacity development of professional organizations and inter-professional organizations regarding formulation and implementation of market oriented VC promotion strategies, 2) productivity growth, quality improvement, infrastructures and market facilities development for improving linkages to markets, 3) improvement of VC service quality and its provision including improvement of organization system, laws and regulations for promotion of private sector investments.

The target areas are 9 regions in Burkina Faso (Centre-Ouest, Centre-Sud, Plateau central, Centre-Nord, Nord, Sahel, Boucle du Mouhoun, Cascades, Hauts-Bassins). The target products are mainly mango, onion, meat and poultry. In addition, VCs of cowpea, sesame and maize are also supported in order to diversify the systems, and especially to improve marketing, processing and storage.

2) Agricultural Productivity and Food Security Project (Projet d'amélioration de la productivité et de la sécurité alimentaire: PAPSA)

The project period of PAPSA is from 2009 to 2018. The budget is 54 million USD and 40 million USD of the budget is financed by World Bank.

The project goals are capacity development of poor producers to increase food production, and improvement of food accessibility in rural markets. PAPSA aims at achieving the goals through implementation of the 3 components (improvement of food production, improvement of food accessibility, establishment of systems and capacity development).

The target areas are communities in the vicinity of nature reserves. The target agricultural products are maize, rice, cowpea, yam and cassava.

3) West Africa Agricultural Productivity Program (Programme de productivité Agricole en Afrique de l'Ouest; WAAPP-1B)

WAAPP is a sub-regional program implementing by the World Bank and it has 2 phases in 10 years in total. The goal is improvement of productivity of major agricultural products selected in each target country. In the first phase, the target countries were Senegal, Mali and Ghana. Cereals, and rice and tubers were researched and developed and the research results were applied to the fields. The activities had certain outcomes. In the second phase started in 2010, Burkina Faso was selected as one of the target counties with Cote d'Ivoire and Nigeria. The program is implemented until 2016 in Burkina Faso. Total budget of the second phase is 119 million USD and 23.99 million USD of the budget is for the program in Burkina Faso. Also, 15 million USD of the budget for Burkina Faso is financed by World Bank.

This program aims at improving productivity of major agricultural products selected in each target country. In the second phase, the knowledge and outcomes of the first phase are extended to other countries. The activities are mainly development and extension of the improved techniques. The project is mainly implemented by agricultural research institutes in each county. In case of Burkina Faso, fruits and vegetables are the target crops.

(2) African Development Bank (AfDB)

The AfDB assists Burkina Faso based on "Extension of result-based Country Strategy Paper from 2005-2009 to 2009-2011 (CSP)" which is an extension of country strategy document for 2005 – 2009. The strategic axes are 1) promotion of economic diversification, 2) improvement of living conditions for vulnerable people. In addition, the AfDB is financing for transport, electric power, social sector and agriculture.

In case of agricultural sector, "Community Investment for Agricultural Fertility Program (Programme

d'Investissement Communautaire en Fertilité Agricole: PICOFA)” (financing amount: 64 million USD), “Comoé-Léraba-Kéné Dougou Area Development Support Project (Projet d'Appui au Développement Local/Comoé-Léraba-Kéné Dougou: PADL/CLK)” (financing amount: 15 million USD), and “Project for Rural Decentralization Development Support in Gnagna and Kourittenga Provinces (Projet d'Appui au Développement Rural Décentralisé dans les Provinces Gnagna-Kourittenga: PADER-GK) (financing amount: 125 million USD) were implemented. In addition, a rural roads development project is implemented in transport sector.

(3) Food and Agriculture Organization of the United Nations (FAO)

1) National Program of Food Security (Programme National pour la Sécurité Alimentaire: PNSA)

Following the Special Program of Food Security implemented from 1995 to 2008, PNSA has been implemented from 2008 to 2015 as the implementation period. The budget is 103.1 billion USD.

The goal is “decreasing number of people suffering from hunger to one third by 2015” in line with the Millennium Development Goals. The detailed goals are 1) diversification and sustainable production increase of domestic food production (agriculture, livestock and fisheries) to meet the demand, 2) improvement and strengthening of accessibility to food supply by households, 3) nutritional improvement of people through reduction of shortage of protein, energy and micronutrients, 4) diversification of nutrient sources and strengthening of research aiming at providing high quality technologies to realize food security.

(4) European Union (EU)

The assistance of EU in Burkina Faso has been implemented based on “the country strategy paper and European Development Fund, the Tenth Phase, 2008-2013” that was established by EU and the government of Burkina Faso. The targets are 1) economic growth and poverty reduction by general budget supports, 2) improvement of water and sewer services, 3) energy development, 4) good governance, 5) sub-regional assistance and sub-regional integration. Especially, macroeconomic development and poverty reduction through direct financial support, which accounts for 60 % of the total budget, and development of basic infrastructures (road, water and sewer services, etc.), which accounts for 26 % of the total budget, are mainly focused.

In case of agricultural sector, supports regarding the food security have been implemented. Water supply and emergency food aid are also supported. Additionally, a project for promotion of fertilizers using human excrement treated hygienically is being implemented.

(5) International Fund for Agricultural Development (IFAD)

1) Agricultural Value Chains Support Project (Projet d'appui aux filières agricoles: PROFIL)

PROFIL was implemented from 2008 to 2013. The budget was 16.86 million USD and 13.83 million USD of the budget was financed by IFAD.

The overall goal was poverty reduction through improvement of accessibility of poverty areas to growing markets. The detailed goals were 1) promotion of linkage among target groups and other actors working on cowpea, sesame, meat (goat, sheep and chicken), and onion VCs, 2) capacity development of the group members and the organizations, 3) improvement of accessibility to services regarding investments and sales for production in the poverty areas. The activities were education and information distribution for strengthening of the VCs, training for the VC building, financing to the activities, etc. In case of projects implemented by the IFAD, the target groups were always those who were in severe poverty areas, especially women and young people.

(6) Enhanced Integrated Framework (Cadre Intégré Renforcé: CIR)

1) Project for supporting commercialize of dry mango and cashew nuts (Projet d'appui a la commercialisation de mangue séchée et de noix de cajou transformée: Non-abbreviation⁵⁸)

This project is implemented with CIR fund that is a worldwide collaboration/fund of donor countries and international organizations for the purpose of supporting trade of developing countries. The implementation agencies are the national implementation unit of CIR (UMNO/CIR) and SNV (Dutch Development Organization). The jurisdiction ministry of Burkina Faso is MICA.

The implementation cost is 1.58 billion FCFA. Out of it, 1.35 billion FCFA (85% of the implementation cost) is covered by CIR and 234 million FCFA (15%) is covered by the Government of Burkina Faso. The implementation period is 3 years from July 2014 and the target sectors are processing and sales of dry mango and cashew nuts.

Objectives of the project is 1) Strengthening of technical and systematic capacity of actors, 2) Improvement of technical capacity of processing units, 3) Increase of export quantity and 4) Improvement of accessibility to financial services for related people. The expected impacts are 20% increase of the export quantity, 10% increase of the income of related people and creation of 150 opportunities of work in processing units.

2.6.2 Bilateral Development Assistance

(1) France

France has supported many sectors such as education, judicature, defense, higher education, infrastructures and so on for a long time. The current assistance policy of France is mentioned in partnership framework document (DCP) which is formulated between France and recipient countries. The development assistance is implemented by AFD and office of cooperation and culture activities (SCAC) in the Embassy of France.

The priority sectors of AFD are primary education, water and sanitation, and basic infrastructures. SCAC is in charge of implementation of the bilateral assistance policy mentioned in the DCP. In case of Burkina Faso, 3 programs such as governance, higher education and research, and promotion of culture diversification have been implemented. The assistance based on the poverty reduction strategy paper of Burkina Faso (economic security of rural people, food security, environmental conservation, sub-regional cooperation) is implemented.

(2) Denmark

Denmark has implemented agricultural sector development assistance since 1992 in Burkina Faso. A new program has been implemented from 2013 to 2017. The assistance plans to shift its target from the government to private sectors. In addition, there is a plan to work with an agricultural bank.

1) Burkina Faso Agricultural Development Support Program Phase II (Programme d'Appui au Développement de l'Agriculture du Burkina Faso, Phase II: PADAB II)

PADAB II was a program implemented from 2006 to 2012. The target areas were Est, Centre-Ouest and Sahel region. The budget is 27.5 billion USD and 25.0 billion USD of the budget is supported by Danish International Development Assistance.

The overall goals were the economic growth, income improvement in rural sector and achievement of the goals in the rural development strategy regarding the food security (SDR). The program consists of 3 components, namely system and organization support, rural development and

⁵⁸ Now, abbreviation of the project has not been decided yet, "CIR-SNV PROJECT" is used as expedient abbreviation in this report.

decentralization, and support for small scale loan).

2) Agricultural Sector Economic Growth Program (Programme de Croissance Economique dans le Secteur Agricole: PCESA)

The program period is 5 years, from 2013 to 2018, and the total budget is 13.4 billion FCFA.

The overall goal of the program is the improvement of the productivity, added value and agricultural income, which contribute to the national economic growth and poverty reduction. Therefore, advisory support services and loans are developed and provided to rural companies for productivity improvement, employment growth and the private sector development. In addition, there is the need to improve conditions for the agricultural and rural sector development, and value chains development selected in PNSR. The target areas are 5 regions (Sahel, Nord, Est, Centre-Est and Centre-Ouest). The target products are cowpea, maize, shea butter, Arabic gum and beef.

The program consists of 2 components of the following.

- a) Component 1: Strengthening the capacity of economic stakeholders in the rural sector through support from support organizations and private banks
- b) Component 2: Improving the environment for private agricultural sector through improvement of legal framework and development of rural infrastructures

(3) United States of America

1) Agribusiness and Trade Promotion (ATP) and Expanded Agribusiness and Trade Promotion (E-ATP)

ATP and E-ATP were implemented by USAID. The implementation period of ATP was from 2008 to 2012 and the budget was about 20 million USD. The implementation period of E-ATP was from 2009 to 2012 and the budget was about 21 million USD. Although both projects had been terminated at the end of September 2012 in the plan, they were extended till the middle of 2013.

The VCs of livestock/meat, maize and onion/shallot were analyzed in ATP. On the other hand, 4 products, rice, poultry, millet and sorghum, were the target products of E-ATP.

Objectives of the both projects were the increase of sub-regional trade value and quantity through 1) quality and quantity improvement of food, 2) poverty reduction by income improvement of producers, 3) strengthening of economic transaction. As a result, stakeholders of the VCs will benefit from the projects. In addition, the both projects aimed at improving socioeconomic standards not only in Burkina Faso but also in other West African countries such as Mali, Senegal, Benin, Cote d'Ivoire, Ghana, Togo and Niger.

The strategies of E-ATP were 1) technical assistance to ECOWAS, UEMOA and CILLSS, 2) grant aid to organizations that have potentials to improve their competitiveness, 3) provision of market information and business promotion services 4) provision of loan services through public-private partnership, 5) improvement of accessibility to loans including bank guarantees, 6) introduction of a warehouse receipt system (warrantage), 7) execution of transfer payments in economical and financial zones.

2) Millennium Challenge Compact (MCC)

The Millennium Challenge Compact is five years program started by USA (Millennium Challenge Corporation) and Burkina Faso in July 2009. The overall goals are poverty reduction and economic growth. The budget was 481 million USD in total and 142 million USD of the budget was for agricultural development.

MCC in Burkina Faso consists of 4 projects; 1) land management in rural areas, 2) agricultural development, 3) road, 4) school project. The goal of the agricultural development project is increase of land productivity in order to increase in agricultural production and improve added value in the target areas. The project can be divided mainly into 3 activities. The first one is irrigation development in Sourou valley and Komoe river basin. The second one is promotion of diversification of agricultural production by promotion of the VCs through support to processing and related sectors. The third one is improvement of accessibility to medium or long term rural credits in 4 regions (Sud-Ouest, Hauts Bassins, Cascades, Boucle du Mouhoun).

(4) Germany

1) Agricultural Development Program (Programme Développement de l'Agriculture: PDA)

The objectives of PDA are sustainable income improvement for rural people and contribution to food security. The budget is 19.8 billion USD and 19.0 billion USD of the budget is covered by German government. The target areas are Est region, Sud-Ouest region and Sissili province. The project period is from 2004 to 2016 and the period is divided into 4 phases of 3 years each.

The program takes VC approach and activities to develop necessary conditions (preconditions) for income improvement of the actors in all stages of the VCs. Especially, the VCs of cassava, rice, sesame and cash nuts are supported. In addition, the program provides opportunities for dialogs among support actors at regional level (local governments, local departments of ministries regarding rural development, local representatives, companies, exporters, traders, etc.), producers, and processors for more effective development of the VCs.

2) Project for Strengthening Production and Trade Capacities of Sesame Value Chain in Burkina Faso (Projet de renforcement des capacités productives et commerciales de la filière sésame au Burkina Faso)

This project is based on the action plan in SNE. UNMO/CIR finances to the Ministry of Commerce and GIZ is in charge in the implementation of the project. The implementation period is 3 years from July 2012 to June 2015. The budget is about 2.67 million USD.

The major activities are 1) support for organization 2) quality improvement, 3) increase in the production and export quantity, 4) capacity development of existing processing facilities and 5) improvement of financial accessibility.

3) Bas-fonds Development Program in Sud-Oest Region and Sissili Province (Programme d'Aménagement des Bas-fonds dans le Sud-Ouest et la Sissili: PABSO)

PABSO was financed by KfW of Germany and implemented in 2 phases from November 2006 (pilot phase: 2006 -2009, the second phase: 2010-2012). The financing amount was 11.6 million Euros.

The goals were creating opportunities for employment and income generation through production, trade and processing of agricultural products, and improving the food security for the residents. The main activities were small scale development of lowlands (Bas-fonds) (construction of seasonal ponds and simple embankment for the purpose of retention of surface water). The components were 1) infrastructure development (development of the lowlands, establishment of storehouses, etc.), 2) incidental works (organizing producers, organizing sales, storage, processing, landholding, environmental preservation, etc.) and 3) support for improving access to rural finance. The target areas were Sud-Ouest region and Sissili province.

(5) Republic of China

1) Rainfed Rice Project (Projet Riz Pluvial: PRP)

The objective of the PRP is development of lowlands. Following the first phase (2002-2007), the second phase (2008-2013) was implemented. Burkina Faso covered 400,000FCFA of the budget and Republic of China covered 11.0 billion FCFA of it. The target of this project is up-land rice and lowland (Bas fond) rice.

In the first phase, the potential for extension of TS2 and TCS10 (the Taiwanese rice varieties) was examined and 1,180 ha/year of lowland development (participatory construction works for soil compaction type embankment to retain surface water and prevent surface soil erosion) were implemented. In the second phase, the activities in the first phase were continued and activities for improvement of the product quality such as trial introduction of small scale post-harvesting facilities were added. The third phase (from 2014 to 2019) also has been implemented. In addition to the activities of the second phase, activities for agricultural mechanization have been implemented in this phase.

2.6.3 Assistance by Other Organizations (NGO, etc.)

(1) Lvia (Association de Solidarité et de coopération Internationale)

Lvia is an Italian NGO and has implemented projects in Burkina Faso since 1972. Sectors of the activities are health, sanitation and agricultural development. In case of the agricultural sector, Lvia has engaged in development of basic infrastructures such as wells and rural roads, and organizing producers.

Lvia implemented a project to support a cowpea sector in Plateau Centre region and Sahel region (including Touguri province) for 3 years from 2006 with financial support of EU. The goals were 1) the improvement of income and diet of cowpea producers, 2) the strengthening of competitiveness of the producers' organizations. It has provided several activities such as trainings for suitable cultivation, storage and post-harvest techniques, organizing the cowpea VC, promotion of the export and so on.

Cowpea producers association (ASK) is a partner in Oubritenga province in Plateau Centre region. Lvia supplied organic agricultural products as materials of MISOLA (nourishing food for children made from millet, maize and soybean) to Guipongou Group (supported by Italian NGO "Mdicus Mundi Italia"), which produces MISOLA, in Zibiare during two years (from January 2013 to December 2014). Therefore, 250 households of members of the ASK started cultivation of millet, maize and soybean in 0.5 ha of each household in 2013. Lvia provided 1) materials and equipments, 2) technical trainings for the cultivation and 3) education for rural residents (nutrition of soybeans) for the ASK.

(2) HELVETAS Swiss Intercorporation

HELVETAS SWISS Inter Corporation is a Swiss nonprofit organization and it was established in 2011 by the merger of Helvetas established in 1995 and Intercorporation established in 1982. It started activities in Burkina Faso in 2002. Sectors of the activities are development of social basic infrastructures, sustainable management of natural resources and education/trainings.

1) Sesame Value Chain Development Project (Projet de développement de la filière sesame)

The financial source of the project is Common Fund for Commodities and HELVETAS is the implementation agency. The relevant organizations are the Royal Tropical Institute in Amsterdam and Ministry of Commerce of Burkina Faso. The main activities are production of high quality

sesame and improvement of added value by processing.

2) Soybeans

HELVETAS selected soybean as an object product for crop rotation of organic cotton cultivation. A verification test to former ESOPs in three places and produced 2 tons of seeds three years ago. HELVETAS has a plan of pilot projects to export organic soybeans to Europe in cooperation with Gebana Afrique Company. The soybeans would be produced in Tenkodogo in Centre-Est region and Diebougou in Sud-Ouest region.

(3) FERT (Formation pour l'Epanouissement et le Renouveau de la Terre)

FERT that is a French NGO is implementing a project of cowpea VC development in Sammatenga province. The target areas are Pissila, Dablo and Pensa in Sammatenga province.

Activities of the project are supports on cultivation techniques such as trial cultivations of cowpea varieties and mix cropping, fertilizer application tests, pesticides application, providing fertilizers and seeds, multiplication of quality varieties by seed production groups. In addition, it supports postharvest processing through capacity development of UDPN, establishment of storehouses, introduction of triple bags and implementation of Warrantage, distribution processes such as production of processing cowpea foods and its sales to SONAGEss by women groups and intermediation to collectors and wholesalers in Ouagadougou and Kaya. Thus, FERT have various activities regarding the cowpea VC promotion related to agricultural inputs, production, postharvest, processing and sales.

(4) Bill and Malinda Gates Foundation

The Foundation is interested in the rice industry in Africa and selected 7 countries (Burkina Faso, Ghana, Mali, Nigeria, Ethiopia, Tanzania and Uganda). Out of the 7 countries, detailed assessment was conducted in 4 counties (Burkina Faso, Ghana, Nigeria and Tanzania) (The budget was about 17 million USD). In case of Burkina Faso, 3 irrigation areas (Bagre, Sourou and West) were focused and companies and distribution networks of the rice were studied in the 3 areas. The Foundation has a plan to conduct a more detailed study for the distribution networks in the next 3 years.

(5) L'Orange Bleue Afrique

L'Orange Bleue Afrique established a private company, Soja Santé, as a project in Burkina Faso. L'Orange Bleue Afrique received a financial support from French company; Nutrition et Santé (a subsidiary company of Otuka Pharmaceutical Co., Ltd. at present). Soja Santé received equipment that was grind machines, separators and packing machines for Tofu production for free. And also, it started processing and selling of soybean foods (Tofu, etc.) under the supervision of technician of Tofu production.

Chapter 3 Outline of Major Markets of Agricultural Products of Burkina Faso

3.1 Export Destinations of Agricultural Products of Burkina Faso

3.1.1 World Trade of Agricultural Products¹

(1) African Agricultural Products in the World Trade of Agricultural Products

The characteristics of the export of African agricultural products in the world trade of agricultural products are listed below.

- a) The export value of world agricultural products in 2012 increased 3.1 times more than that in 2001, and the value was 1,300 billion dollars in 2012.
- b) On the other hand, the export value of African agricultural products in 2012 increased 4.3 times more than that in 2001, and the value was 44 billion dollars in 2012.
- c) The percentage of the export value of African agricultural products in world agricultural products was at only 2 to 3% in that period.
- d) The export value of agricultural products of 4 countries, South Africa, Ghana, Cote d'Ivoire and Kenya, accounted for about 50% of total export value of African agricultural products in 2012. The export value of agricultural products of Burkina Faso accounted for about 1.1% of that of Africa.
- e) Since the percentage of the export value of the 4 countries mentioned above decreased from about 60% in 2001 to about 50% in 2012, it is clear that the export of other African countries except for those 4 countries are increasing.

Table 3.1.1 Change of the Export Value of Agricultural Products of Major African Countries

[Unit: billion USD]

	World Export Value of Agricultural Products (a)	African Export Value of Agricultural Products (c)	Percentage of Africa (d)=(c)/(a)	South African Export Value of Agricultural Products (e)	Ghanaian Export Value of Agricultural Products (f)	Ivorian Export Value of Agricultural Products (g)	Kenyan Export Value of Agricultural Products (h)	Burkina Faso's Export Value of Agricultural Products (i)
2001	410.87	10.22	2.5%	1.85	-	2.09	1.02	0.13
2002	435.83	7.98	1.8%	1.90	-	-	0.55	0.13
2003	508.68	13.67	2.7%	2.32	1.10	3.12	1.25	0.26
2004	582.36	14.70	2.5%	2.60	-	3.15	1.29	0.35
2005	629.79	16.04	2.5%	3.01	1.10	2.92	1.52	0.29
2006	695.13	18.34	2.6%	2.87	1.73	2.98	1.79	-
2007	839.18	19.34	2.3%	3.07	1.28	3.28	2.10	0.39
2008	1,025.90	24.03	2.3%	4.30	1.32	4.01	2.58	0.27
2009	914.26	26.35	2.9%	4.30	1.30	4.90	2.35	0.33
2010	1,038.45	29.33	2.8%	4.96	1.11	5.13	2.78	0.34
2011	1,264.91	35.37	2.8%	5.54	3.63	5.45	3.01	0.45
2012	1,272.05	44.33	3.5%	5.38	5.63	5.99	2.80	0.48
Increasing Rate	3.1	4.3	1.4	2.9	5.1	2.9	2.8	3.7

Source: Made from data of the "Trade Map" by the JICA team

Note: The increasing rates were obtained by dividing the export values in 2001 by those in 2012. In case of Ghana, the export value in 2003 was used instead of that in 2001.

¹ Export value and quantity of agricultural products are based on the Trade Map

(2) Trend of Export Products in the World Trade of Agricultural Products

The OECD classifies agricultural products into the following 4 groups².

- a) Bulk products (wheat, coffee, tea, cotton, etc.)
- b) Horticulture products (vegetables, fruits, flowers, etc.)
- c) Semi-processed products (animal fat, vegetable oil, etc.)
- d) Processed products (frozen meat, chocolate, etc.)

Based on the 4 groups of agricultural products classified by the OECD, the trends of the world trade in the past 20 years are listed below.

- a) In the world trade of agricultural products in the past 20 years, the percentage of bulk products decreased and that of processed products increased to about half of all of the trade. The bulk products are not major products in the world trade of agricultural products at present (Fig. 3.1.1).
- b) In the export of African agricultural products, the percentage of the bulk products in the total export value of African agricultural products was about 35% in 1985, which is the largest among other agricultural products, although it rapidly decreased. On the other hand, horticulture products and processed products are increasing and they accounted for about 30% and about 20% respectively in 2012 (Fig. 3.1.2).
- c) Therefore, processed products are major products in the world trade of agricultural products. In case of exports from African countries, horticultural products are increasing and bulk products are decreasing.

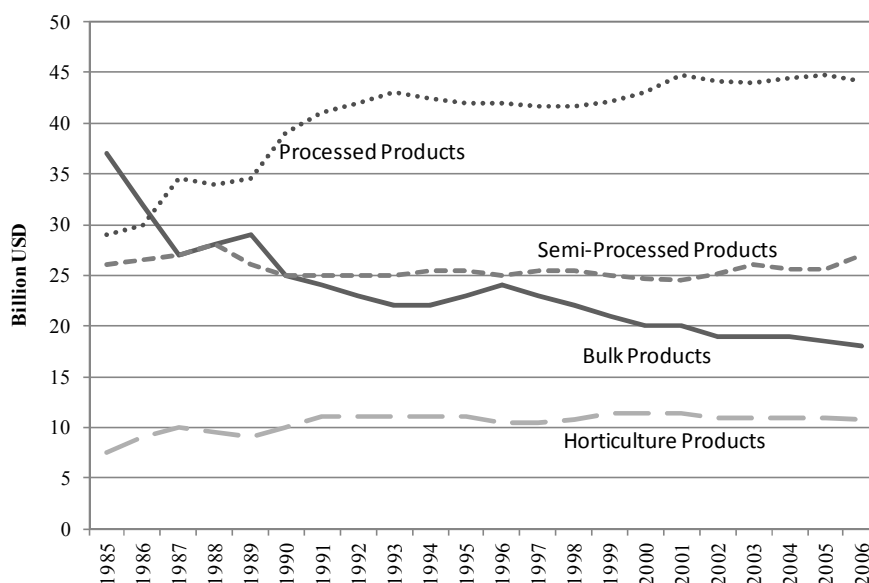


Fig. 3.1.1 Trend of the World Trade Value of Agricultural Products by Export Product Groups
Source: OECD, Business for Development 2008, Promoting Commercial Agriculture

² OECD, Business for Development 2008, Promoting Commercial Agriculture

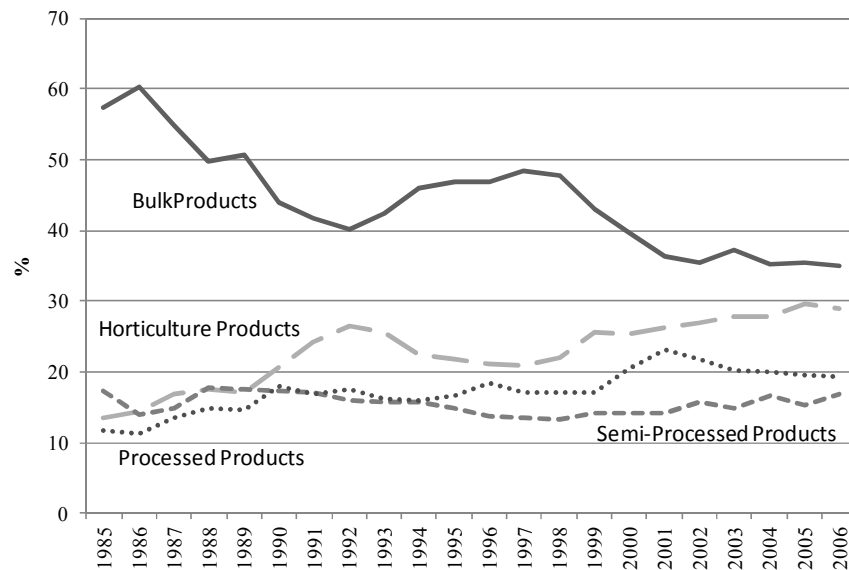


Fig. 3.1.2 Percentage of African Agricultural Products in the World Trade of Agricultural Products by Export Product Groups

Source: OECD, Business for Development 2008, Promoting Commercial Agriculture

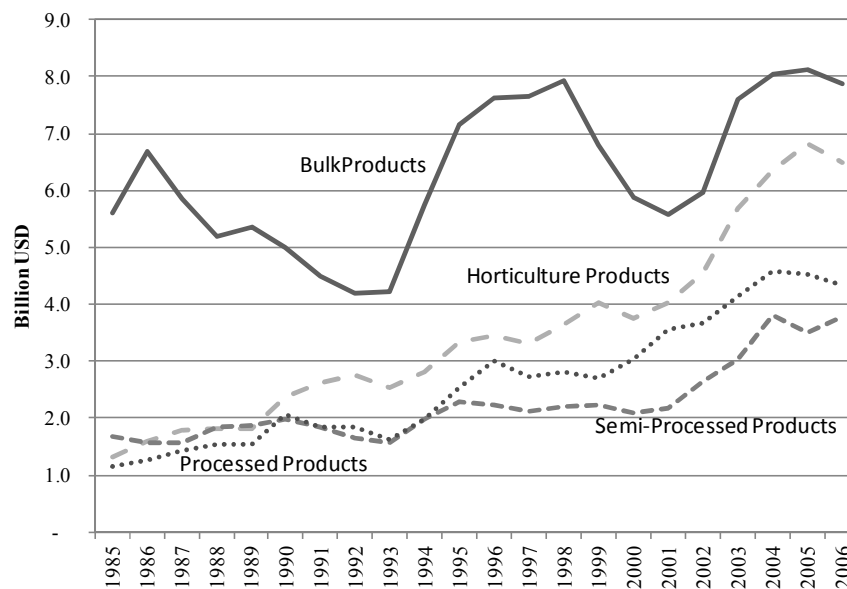


Fig. 3.1.3 Trend of Trade Values of African Agricultural Products by Export Product Groups

Source: OECD, Business for Development 2008, Promoting Commercial Agriculture

3.1.2 Change of the Total Export Value and Export Destinations of Burkina Faso

Export values of Burkina Faso by region are shown in the figure below³. Although the export value to Africa was more than that to Europe from 2003 to 2005, the export value to Europe was the most before and after that period. The export value accounted for 58% of the total export value to the world in 2013. Following Europe, the export values to Africa and Asia were high and they accounted for 22% and 19% respectively. The total export value quickly increased from 2008 mainly because of the increase of the export value of gold to Europe.

³ Classification of the countries in regions is followed in the Trade Map. America includes South and North America. Asia includes most parts of the Middle East region. Africa includes the Maghreb region and some parts of the Middle East region.

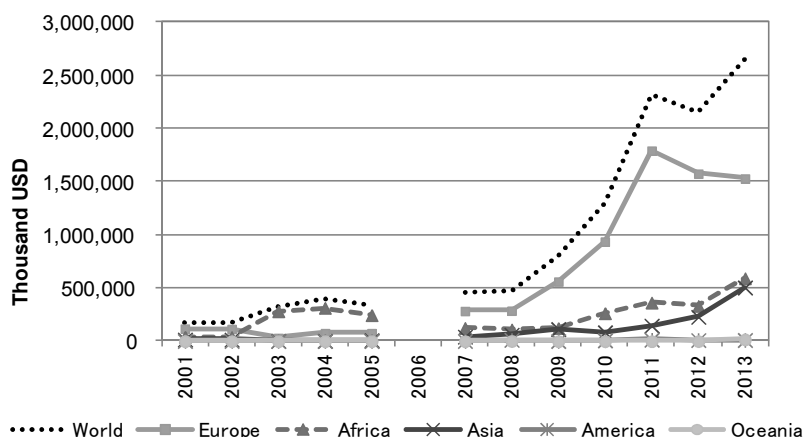


Fig. 3.1.4 Change of the Export Value of Burkina Faso
 Source: Made from data of the “Trade Map” by the JICA team

3.1.3 Change of Export Value and Export Destinations of Agricultural Products of Burkina Faso

(1) Export Destinations of Agricultural Products

Although the export value of agricultural products⁴ was stagnant from 2005 to 2008, it increased after that. The export value of agricultural products accounted for about 28% of the total export value in 2013.

The export value of agricultural products to Europe was the largest from 2007 to 2011 as well as the total export value. The export value of agricultural products to Europe accounted for about 52% in 2011. However, the export value of agricultural products to Asia has increased since 2010 and it has been more than that to Europe in 2012. As a result, percentages of the regions in the export value of agricultural products were Asia (64.4%), Europe (19.7%) and Africa (14.2%) in 2013. Those to South and North America and Oceania were very small. Reason of the increase of export value to Asia in recent years is mainly increase of export value of sesame and cotton.

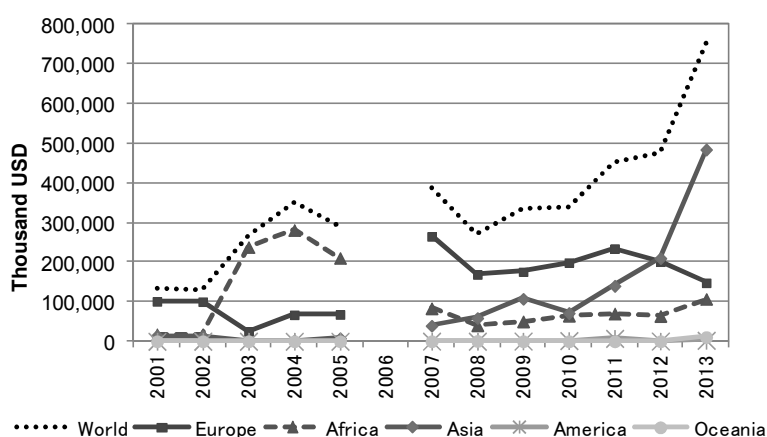


Fig. 3.1.5 Change of the Export Value of Agricultural Products of Burkina Faso
 Source: Made from data of the “Trade Map” by the JICA team

⁴ The agricultural products have the following HS codes in this chapter: HS07(Edible vegetables and certain roots and tubers), HS08(Edible fruit and nuts; peel of citrus fruit, melons), HS09(Coffee, tea, maté and spices), HS10(Cereals), HS11(Products of milling industry; malt; starches; inulin; wheat gluten), HS12(Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder), HS15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), HS17(Sugars and sugar confectionery), HS20(Preparations of vegetables, fruit, nuts or other parts of plants), HS52(Cotton)

(2) Proportion of Export Values of Each Agricultural Product

The proportion of export values of each agricultural product from Burkina Faso to each region in the total export value of agricultural products in 2013 are shown in the figure below. Cotton accounted for about 60% of the total export value of agriculture products to the world and oil seeds (27.7%) and fruits and nuts (7.8%) followed it. In the export value of agricultural products to Europe, the percentage of cotton was higher than that to the world and accounted for 72.4%. In that to Asia, cotton and oil seeds accounted for more than 95% of total. In that to Africa, the percentage of cotton was low (22.2%), and that of oil seeds was high (41.1%). In addition, it is noticeable that cereals and vegetables accounted for 9.1% and 8.3% of the total export values of agricultural products to Africa whereas the export values to other region are very small.

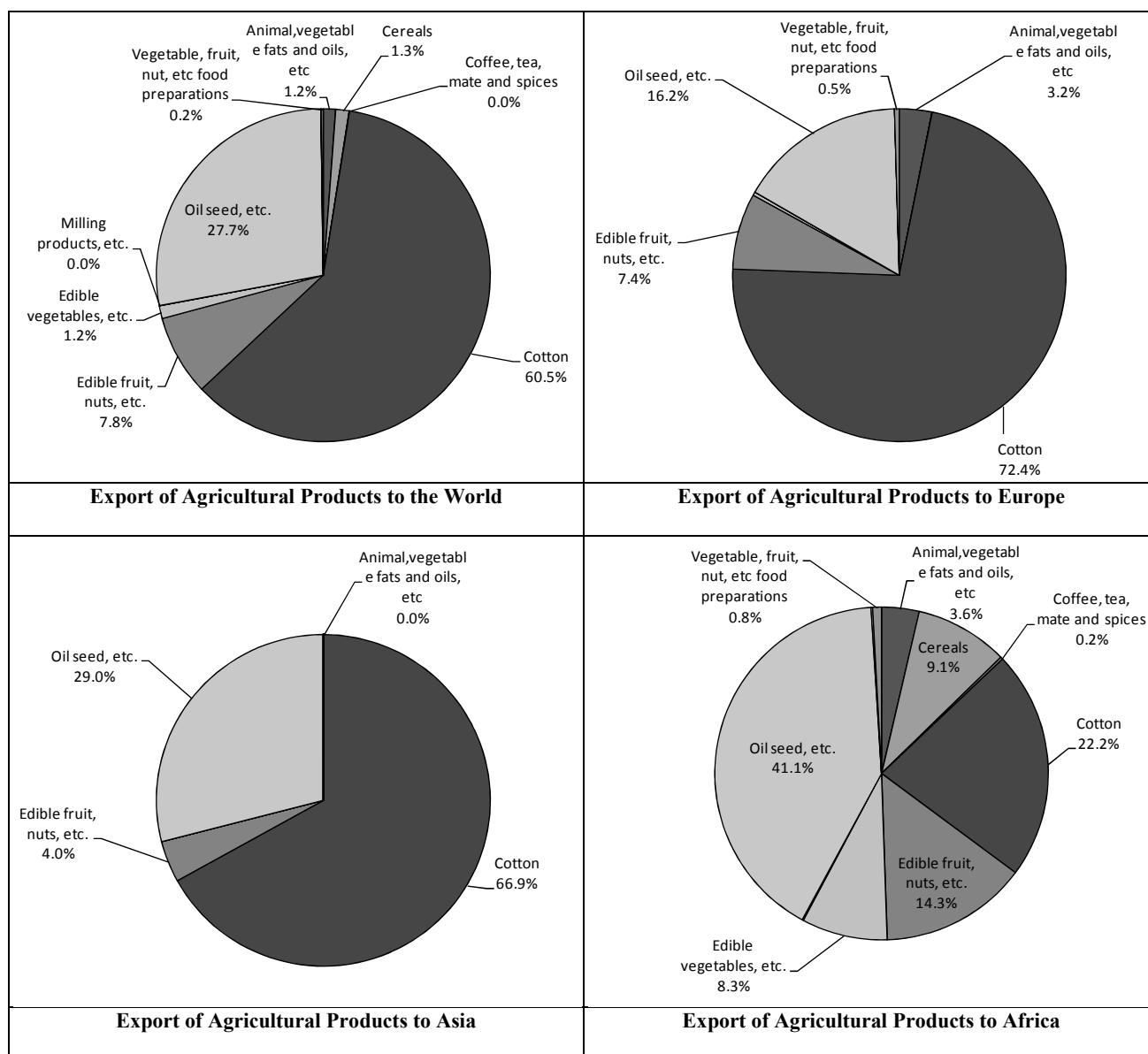


Fig. 3.1.6 Proportion of Each Agricultural Product in the Export Value of Agricultural Products of Burkina Faso (2013)

Source: Made from data of the "Trade Map" by the JICA team

3.2 International Market

3.2.1 EU Region

(1) Population Change

The population in the 28 countries of the EU was about 492 million people in 2003 and was about 507 million people (1.03 times increase) in 2013. It had increased slightly. The annual population increase rate was low, such as from -0.1 to 0.4%, and it is estimated that the rate will also be low in future.

Table 3.2.1 Population Change in the EU Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population (thousands)	492,341	494,330	496,303	498,179	500,032	501,924	503,408	504,632	506,031	505,640	506,739
Population Increase Rate	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.2%	0.3%	-0.1%	0.2%

Source: Made from data of the "World Development Indicators, World Bank" by the JICA team

(2) GDP

In comparison with the real GDP in 2003, that in 2013 was 1.11 times higher. The annual increase rates ranged from negative to 3.4% at the maximum level, thus they were not high in general. In particular, it largely decreased in 2009 because of the global economic crisis.

The real GDP per capita was 26,831 USD in 2003 and 28,906 USD in 2013 and it increased by 1.08 times. The value increased by 2,075 USD in 10 years from 2003 to 2013. The GDP per capita was also a very high value among the major export directions of Burkina Faso.

Table 3.2.2 Change of GDP and GDP per Capita in the EU Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
GDP (billion USD) (constant 2005 USD)	13,210	13,555	13,851	14,320	14,778	14,831	14,159	14,448	14,686	14,632	14,648
GDP Increase Rate (constant 2005 USD)	1.5%	2.6%	2.2%	3.4%	3.2%	0.4%	-4.5%	2.0%	1.6%	-0.4%	0.1%
GDP per Capita (USD) (constant 2005 USD)	26,831	27,421	27,909	28,744	29,554	29,549	28,126	28,632	29,022	28,938	28,906
GDP per Capita Increase Rate (constant 2005 USD)	1.1%	2.2%	1.8%	3.0%	2.8%	0.0%	-4.8%	1.8%	1.4%	-0.3%	-0.1%

Source: Made from data of the "World Development Indicators, World Bank" by the JICA team

(3) Import of Agricultural Products

The change of the import value of agricultural products of the EU region is shown in the figure below. However, the import value within the EU region is included. The import value of agricultural products was about 237 billion USD in 2013. The import value of fruits and nuts was the highest from 2001 to 2013, and the import value was 46.8 billion USD in 2013. It was 19.7% of the total export value of agricultural products. Although the import values of many agricultural products increased after 2001, that of cotton decreased. The increase rates of agricultural products were also low or almost leveled off after 2008. However, the increase rate of fats and vegetable oils was relatively high and the import value was ranked second in 2011.

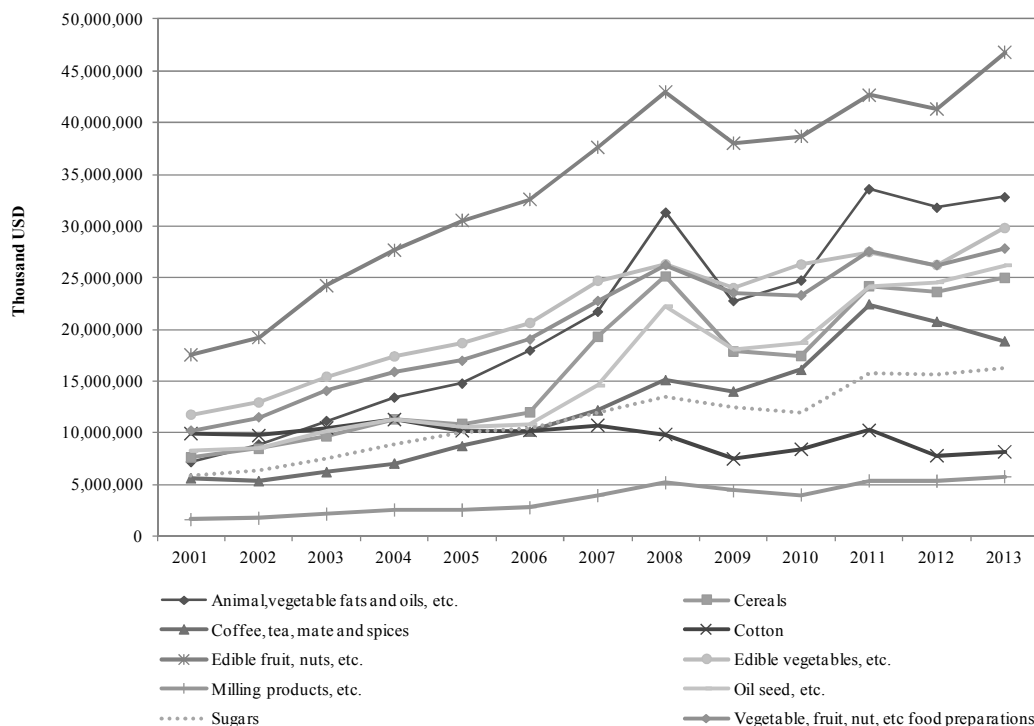


Fig. 3.2.1 Change of the Import Value of Agricultural Products of the EU Region
 Source: Made from data of the “Trade Map” by the JICA team

The proportions of each agricultural product in the import value of agricultural products in 2013 are shown in the figure below. There is no trend that the import value of specific products is high or low, and various agricultural products are imported.

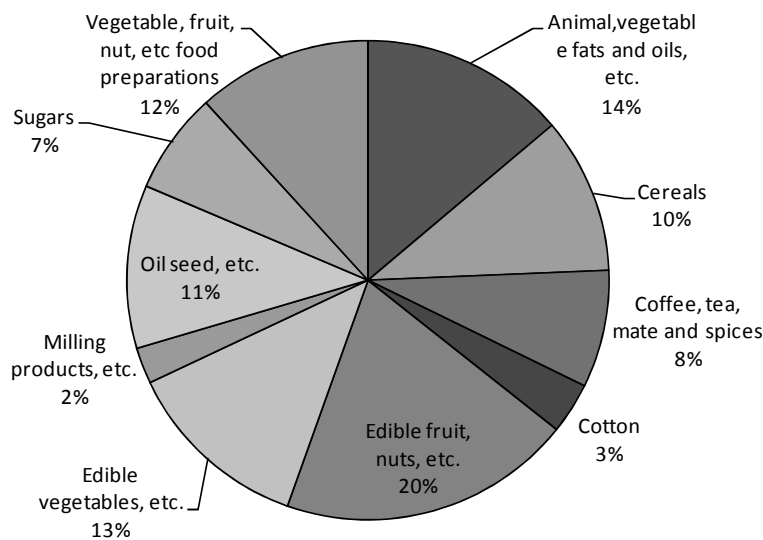


Fig. 3.2.2 Proportion of Each Agricultural Product in the Import Value of Agricultural Products of the EU Region (2013)

Source: Made from data of the “Trade Map” by the JICA team

Although there is difference in food consumption quantity among countries in the EU region, it is expected that it will not largely increase in the future since the population increase rate is already low and the market is saturated. In this situation, consumers take an increasing interest in food and strictly select the food. As a result, it is said that more health-oriented or safety-oriented foods are selected by consumers and the needs are diversified. In addition, since the percentage of elderly people is increasing and those people consider their health more carefully, they tend to avoid high calorie food,

eat more vegetables and fruits along with less fat foods⁵.

(4) Characteristics

The population in the 28 countries of EU was about 500 million people in 2013. Although GDP per capita was high (about 29,000 USD), the population increase and economic growth are stagnated and it is not expected that the market scale will increase in future. However, in the import value, the EU market has the overwhelming economic scale among the 3 target markets of the M/P. In addition, various agricultural products are imported. Moreover, based on the increasing demand of safety-oriented or healthy-oriented food, diversification of consumers' needs and creation of niche market are expected.

In the EU countries, there is a food system consisting of distribution of agricultural products and food related industry. As the food related industries, industries of food production, wholesale, retail sale and restaurant have been developed. Development of new foods made from agricultural product and creation of demands are expected. In the EU market, niche market of organic products of bulk products has been created and requirements on quality and safety are high. In addition, since population of elderly people is increasing in the EU countries, consumption of vegetables and fruits are increasing.

3.2.2 Middle East Region

(1) Population Change

The population in the Middle East region was about 314 million people in 2003. It increased to 376 million people (about 1.20 times increase) in 2012. The annual population increase rate was from 1.8 to 2.1%, which is slightly high.

Table 3.2.3 Population Change in the Middle East Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Population (thousands)	313,956	320,393	327,043	333,932	341,023	348,213	355,415	362,440	369,271	376,053
Population Increase Rate	2.0%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.0%	1.9%	1.8%

Source: Made from data of the "World Development Indicators, World Bank" by the JICA team

Notes: Data of 2013 is not available.

(2) GDP

The real GDP increased 1.63 times from 2003 to 2012 and it was about 2.35 trillion USD in 2012. Following the EU region, it was the second highest value in the major export directions of Burkina Faso. However, the real GDP increase rate fluctuated a lot from -0.1% in 2009 to 9.1% in 2004.

The real GDP per capita reached about 6,600 USD in 2012. However, the increase rate of GDP per capita also fluctuated a lot from -2.0% to 6.9% in the same manner as GDP. Comparing with the real GDP per capita in 2003, it increased 1.34 times in 2012.

Table 3.2.4 Change of GDP and GDP per Capita in the Middle East Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP (billion USD) (constant 2005 USD)	1,445	1,577	1,680	1,802	1,909	1,993	1,991	2,124	2,263	2,349
GDP Increase Rate (constant 2005 USD)	5.0%	9.1%	6.6%	7.2%	5.9%	4.4%	-0.1%	6.7%	6.6%	3.8%

⁵ "Food Consumption in the European Union: Main Determinants and Country Differences" Agribusiness, Vol. 17 (4) 460-488 (2011)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP per Capita (USD) (constant 2005 USD)	4,958	5,298	5,534	5,815	6,039	6,079	5,954	6,230	6,516	6,642
GDP per Capita Increase Rate (constant 2005 USD)	2.8%	6.9%	4.5%	5.1%	3.9%	0.7%	-2.0%	4.6%	4.6%	1.9%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team
Notes: Data of Syria is not included.

(3) Import of Agricultural Products

The change of the import value of agricultural products of the Middle East region is shown in the figure below. The import value of cereals was the highest and it has increased since 2010. However, the other import values including the second highest products (animal or vegetable fats and oils) have been stopped increasing since 2011, and they have been less than 10 billion USD.

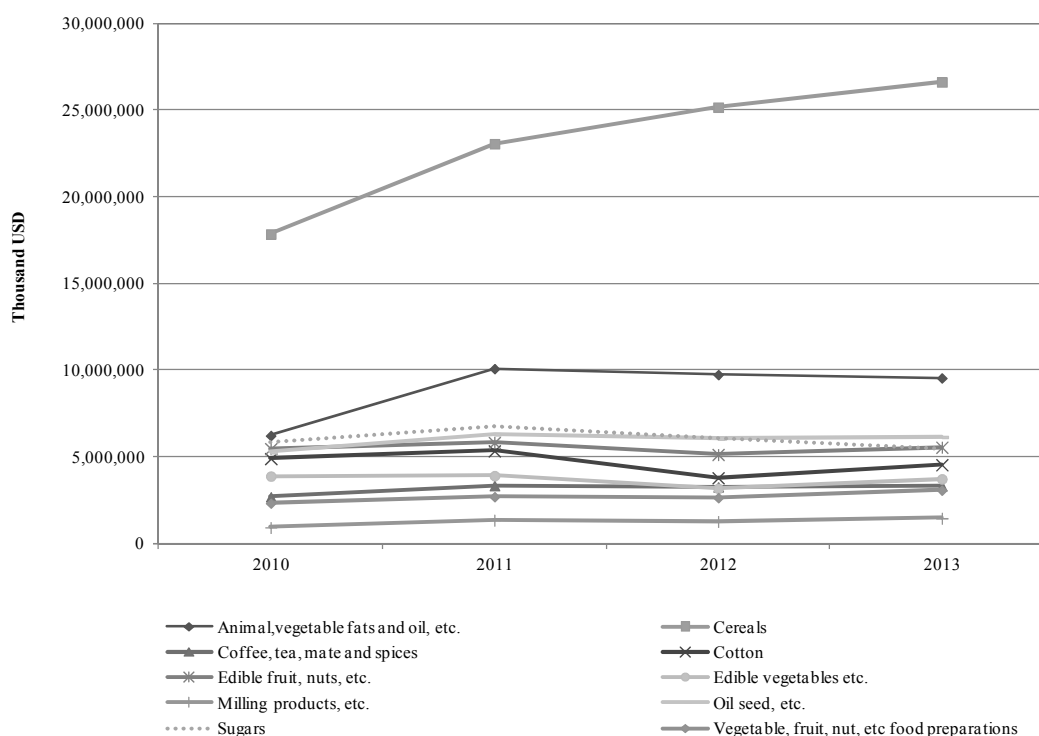


Fig. 3.2.3 Change of the Import Value of Agricultural Products of the Middle East Region

Source: Made from data of the “Trade Map” by the JICA team
Note: Data before 2009 were not available.

The proportions of each agricultural product in the total import value of agricultural products in 2013 are shown in the figure below. The total import value of agricultural products was about 69.5 billion USD in 2013. The import value of cereals was the highest and accounted for 38%. Following it, fats and vegetable oils accounted for 14%. In addition to those percentages, many products such as sugar, cotton, oil seeds, fruits, vegetables, etc. were imported.

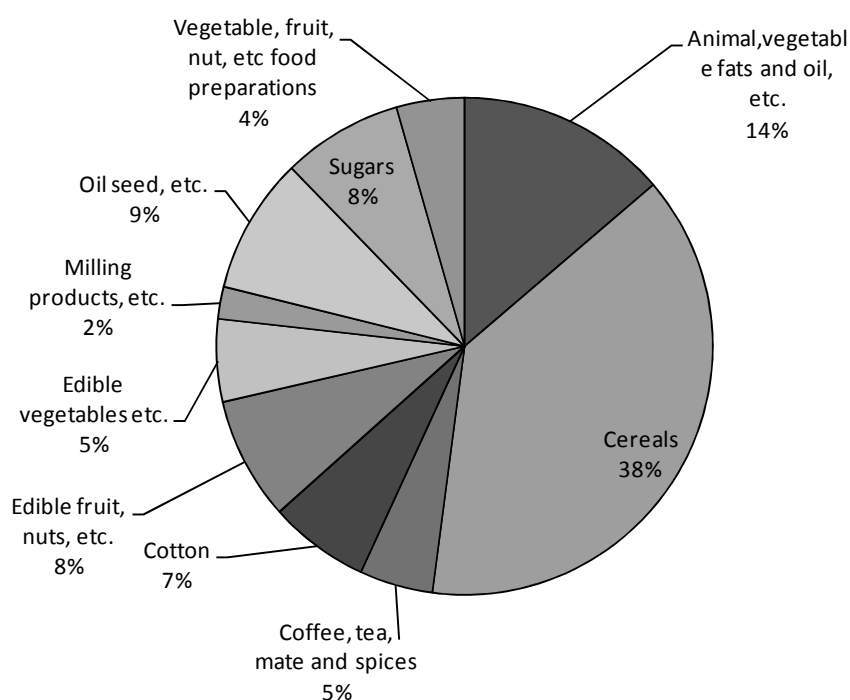


Fig. 3.2.4 Proportion of Each Agricultural Product in the Import Value of Agricultural Products of the Middle East Region (2013)

Source: Made from data of the "Trade Map" by the JICA team

(4) Characteristics

Market of the Middle East region had about 376 million people in 2012 and the population is increasing. GDP per capita was about 6,600 USD. The market scale is relatively large and it will increase more in future.

Although import of cereals is large and it accounts for about 40% of import of agricultural products, various agricultural products in addition to the cereals are imported. It is expected that the region is one of promising markets since the economic growth is expected. Furthermore, there is some possibility that proportions of vegetables, fruits, processed food, etc. would increase in future as well as EU region. However, irrigation agriculture is developed and various crops are cultivated in the region although most area of the Middle East region locates in dry area and most part is not suitable for the grain production.

3.2.3 Maghreb Region

(1) Change of Population

The population was 80 million people in 2003 and it increased to about 93 million people (1.15 times) in 2013. Since the number of countries in the Maghreb region is only 5 countries, the total population is smaller than those of other regions. The annual population increase rates ranged from 1.2 to 1.6%. They had gently increased.

Table 3.2.5 Change of Population in the Maghreb Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population (thousands)	80,818	81,812	82,856	83,954	85,101	86,309	87,580	88,904	90,302	91,731	93,194
Population Increase Rate	1.2%	1.2%	1.3%	1.3%	1.4%	1.4%	1.5%	1.5%	1.6%	1.6%	1.6%

Source: Made from data of the "World Development Indicators, World Bank" by the JICA team

(2) GDP

The real GDP increased about 1.37 times from 2003 to 2013, and it was about 298 billion USD in 2013. It was lower in comparison with that of other regions. The increase rates ranged from -9.3 to 11.3 %. Although the rates fluctuated widely, they were relatively high.

The real GDP per capita was 3,193 USD in 2013. It was 1.18 times of that in 2003. The value was about half of that in the Middle East region. Although GDP per capita increase rates also fluctuated from -10.7 to 9.6 %, they were also relatively high.

Table 3.2.6 Change of GDP and GDP per Capita in the Maghreb Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
GDP (billion USD) (constant 2005 USD)	218	228	241	252	263	272	280	291	263	293	298
GDP Increase Rate (constant 2005 USD)	7.7%	4.6%	5.6%	4.6%	4.1%	3.6%	2.8%	3.9%	-9.3%	11.3%	1.5%
GDP per Capita (USD) (constant 2005 USD)	2,701	2,792	2,911	3,006	3,086	3,154	3,194	3,268	2,918	3,196	3,193
GDP per Capita Increase Rate (constant 2005 USD)	6.4%	3.4%	4.3%	3.3%	2.7%	2.2%	1.3%	2.3%	-10.7%	9.6%	-0.1%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team

(3) Import of Agricultural Products

The change of the import value of agricultural products of the Maghreb region is shown in the figure below. The import value of cereals that was the highest widely ranged from 4.5 billion to 8 billion USD since 2007 and the trend of increase or decrease was not clear. The import values of other agricultural products were less than 2.5 billion USD. The import value of animal fats and vegetable oils that is the second highest changed as same as that of cereals. On the other hand, import values of other agricultural products except sugar leveled off although that of sugar increased slightly.

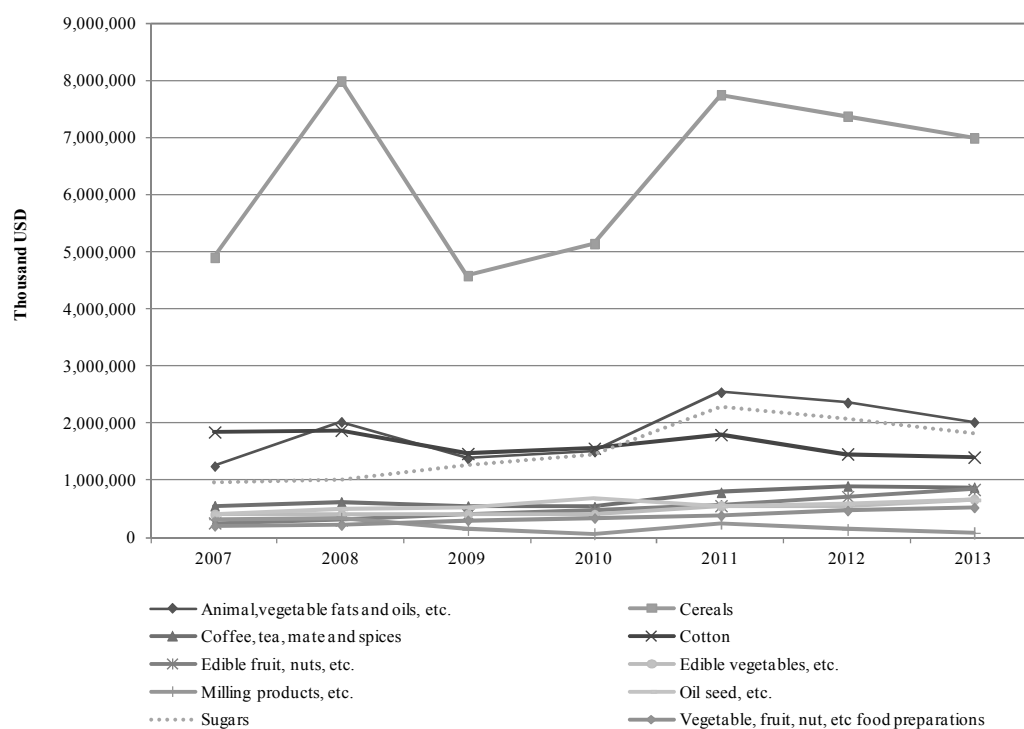


Fig. 3.2.5 Change of the Import Value of Agricultural Products of the Maghreb Region

Source: Made from data of the “Trade Map” by the JICA team

Note: Data before 2006 were not available.

The proportions of each agricultural product in the import value of agricultural products in 2013 are shown in the figure below. The total import value of agricultural products was about 15.9 billion USD in 2013. Although the proportions of cereals (44 %) and animal fats and vegetable oils (13%) were large as same as that of the Middle East region, other agricultural products also accounted for certain percentages and various products were imported.

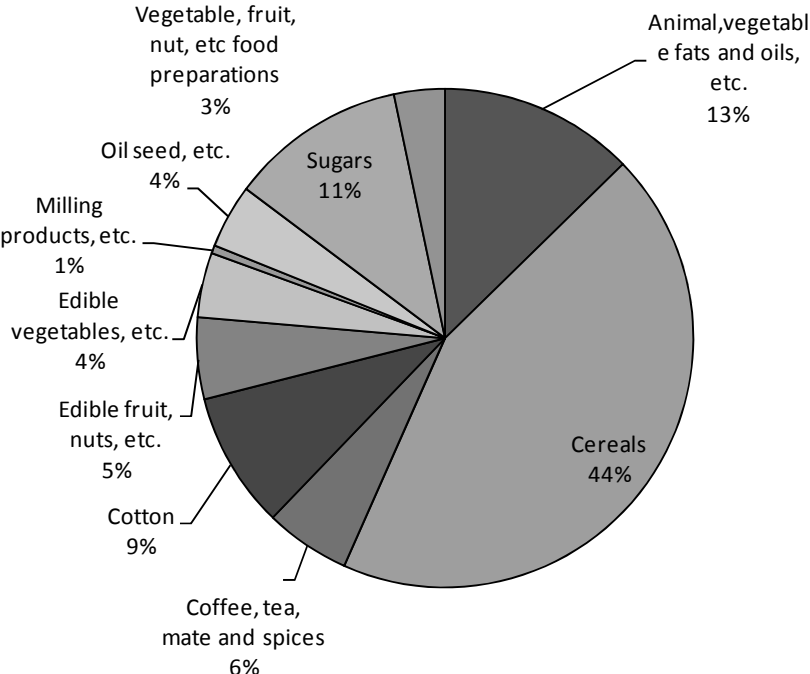


Fig. 3.2.6 Proportion of Each Agricultural Product in the Import Value of Agricultural Products of the Maghreb Region (2013)

Source: Made from data of the “Trade Map” by the JICA team

(4) Characteristics

Population of the Maghreb market was about 93 million people in 2013 and it is slightly increasing. GDP per capita was about 3,200 USD. Although the population increase rate is low, the economic growth rate is high. The market scale may become larger though increase of the GDP per capita.

The characteristics of the import of agricultural products are same as that of the Middle East region, and cereals accounts for about 40%. Various agricultural products share the remaining 60%. The Maghreb market is a relatively near market from Burkina Faso and it is expected that the distance to the market will be shortened by development of air routes, corridors, etc. in meddle or long term.

3.3 Sub-regional Market

3.3.1 Population Change

The population in the ECOWAS region was about 250 million people in 2003. However, it increased to about 327 million people (1.31 times) in 2013. Although the ECOWAS region has smaller markets with smaller population than the Middle East region, the annual population increase rates were high; from 2.6 to 2.8%. It is estimated that the high increase rate will continue in future.

Table 3.3.1 Population Change in the ECOWAS Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population (thousands)	249,710	256,332	263,207	270,347	277,750	285,413	293,324	301,475	309,866	318,500	327,361
Population Increase Rate	2.6%	2.7%	2.7%	2.7%	2.7%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team

3.3.2 GDP

The real GDP in the ECOWAS region was about 276 billion USD in 2013. It was low in comparison with other regions, although 15 countries are included in the ECOWAS region. However, the GDP in 2013 was 1.97 times of that in 2003. The annual increase rates ranged from 6 to 7% and they were relatively high.

The real GDP per capita was 843 USD in 2013 and there was a big difference in real GDP per capita among other regions. However, it increased to about 1.50 times higher than that in 2003 and the real GDP per capita increase rates were also relatively high.

Table 3.3.2 Change of GDP and GDP per Capita in the ECOWAS Region

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
GDP (billion USD) (constant 2005 USD)	140	170	176	188	199	210	222	238	248	261	276
GDP Increase Rate (constant 2005 USD)	7.2%	21.0%	3.7%	6.7%	5.9%	5.8%	5.6%	6.9%	4.5%	5.2%	5.7%
GDP per Capita (USD) (constant 2005 USD)	562	662	669	695	716	737	758	788	801	820	843
GDP per Capita Increase Rate (constant 2005 USD)	4.4%	17.8%	1.0%	3.9%	3.1%	3.0%	2.8%	4.0%	1.6%	2.3%	2.9%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team

(1) Comparison of Population and GDP per Capita among the ECOWAS Countries

According to the experience of developed countries, consumption structure starts changing when the GDP per capita is over around 1,000 USD. Furthermore, according to World Bank, if GNI⁶ per capita is over 1,045 USD, its class changes from low income economies to middle income economies (2013). Among the ECOWAS countries, countries which GDP per capita is more than 1,000 USD are Cape Verde, Nigeria, Ghana, Cote d’Ivoire and Senegal (Fig. 3.3.1). Sierra Leone and Benin are following these countries. These countries are promising sub-regional market of Burkina’s products. However, Nigeria is a large consumption country and also a large agriculture production country.

⁶ GNI (Gross National Income) = GDP (Gross Domestic Product) + Gross income from foreign countries

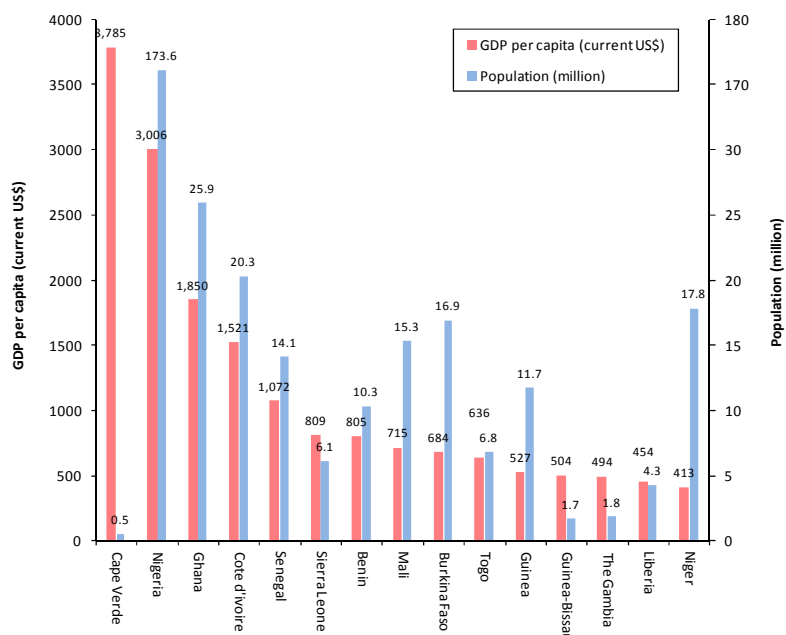


Fig. 3.3.1 GDP per Capita and Population of the ECOWAS Countries (2013)

Source: World Bank, World Data Bank, 2013

In recent years, GDP per capita and population are increasing year by year in many African countries. GDP per capita and population of Burkina Faso and the neighboring countries (Ghana, Cote d'Ivoire, Senegal, Benin, Mali and Niger) in 1993, 2003 and 2013 were surveyed. Comparing 20 years ago, increase of GDP per capita was between about 1.6 and 4.9 times and that of population was between 1.5 and 2.1 times in 2013 in the all countries. Moreover, GDP per capita of many countries drastically increased in the last 10 years although the population increase rates of almost all countries were almost same for 20 years (Fig. 3.2.2). Especially, growth of Ghana increased remarkably and Cote d'Ivoire, Senegal and Benin followed it. However, Cote d'Ivoire reached high growth in 1970s. These countries are promising market of Burkina's products.

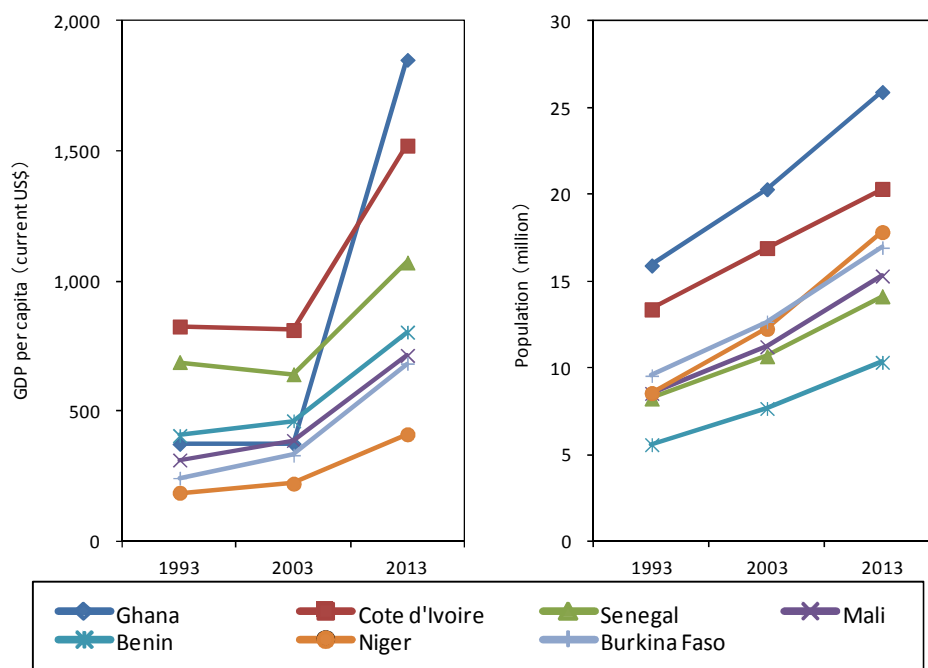


Fig. 3.3.2 Change of GDP per Capita and Population of Burkina Faso and the Neighboring Countries

Source: World Bank, World Data Bank, 1993, 2003, 2013

(2) Percentage and Population of the Middle Class of the ECOWAS Countries

AfDB estimates that the population of the middle class (daily expenditure per capita is between 4 to 20 dollars) in Africa is increasing. It is generally said that the incomes of the middle class are from salary or thorough small scale business, they live in urban areas, they have few children and their expenditure for education and food is higher than those of the lower class. In addition, the middle class offers more demand for goods and services supplied by the private sector, and they are contributing to an increase of domestic consumption⁷.

Therefore, population of the middle class is an important indicator as a standard of buying power as well as GDP per capita to consider target markets. Percentages of the middle class of the neighboring countries were Ghana (46.6%), Cote d'Ivoire (37.1%), Senegal (35.7%), Mali (25.1%), Benin (17.7%), and Niger (14.0%) in 2010. In addition, population of the middle class was calculated from the population in 2010. They were Ghana (11.31 million), Cote d'Ivoire (7.04 million), Senegal (4.62 million), Mali (3.51 million), Benin (1.68 million) and Niger (2.23 million). According to these data, total population of the middle class in the neighboring countries was 30.39 million people. In consideration with the economic growth of those countries in future, it is a promising and large market of Burkina's products.

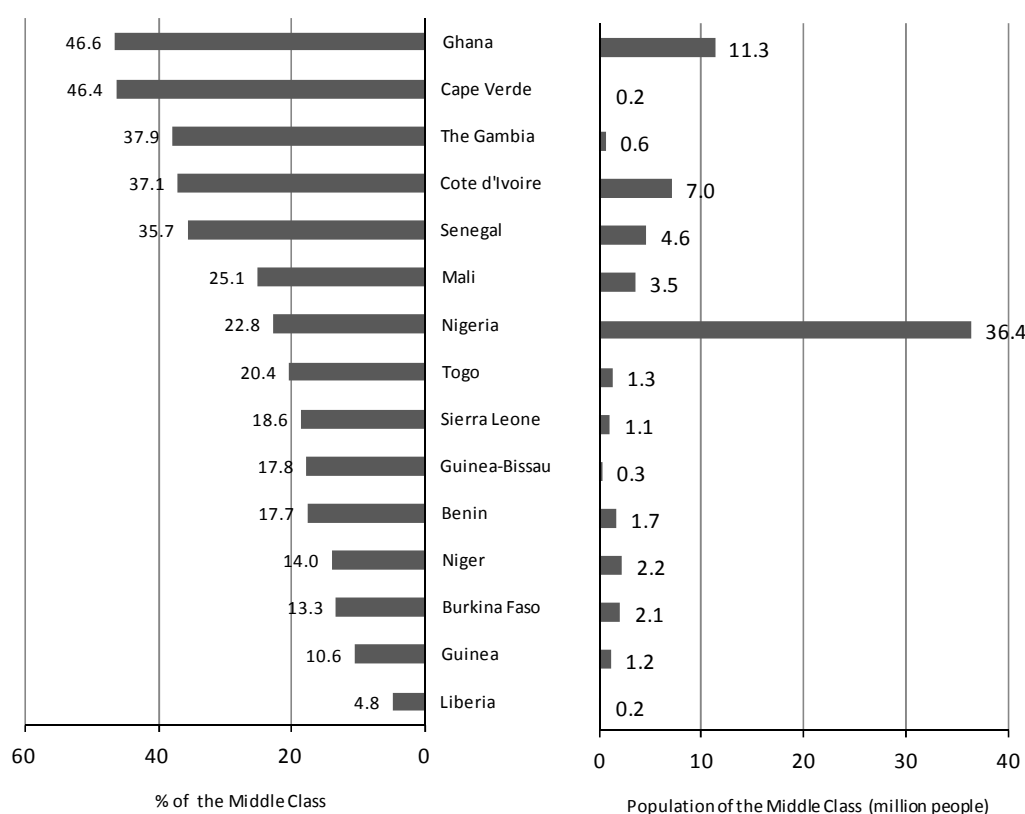


Fig. 3.3.3 Percentage and Population of the Middle Class of the ECOWAS Countries (2010)

Source: African Development Bank, Market Brief, 'The Middle of the Pyramid; Dynamics of the Middle Class in Africa'
World Bank, World Data Bank, 2010

*In this report, the middle class means total of lower-middle class (daily expenditure per capita is from 4 to 10 USD), upper-middle class (daily expenditure per capita is from 10 to 20 USD) and floating class (daily expenditure per capita is from 2 to 4 USD).

3.3.3 Import of Agricultural Products

The change of the import value of agricultural products of the ECOWAS region is shown in the figure below. Import value of cereals is the highest. Its value was more than 8 billion USD in 2011 and then decreased after that. As same as it, import value of sugar was about 2.1 billion USD in 2011 and then

⁷ "The Middle of the Pyramid: Dynamics of the Middle Class in Africa", AfDB

decreased after that. Other import values leveled off since 2010 at less than around 1 billion USD.

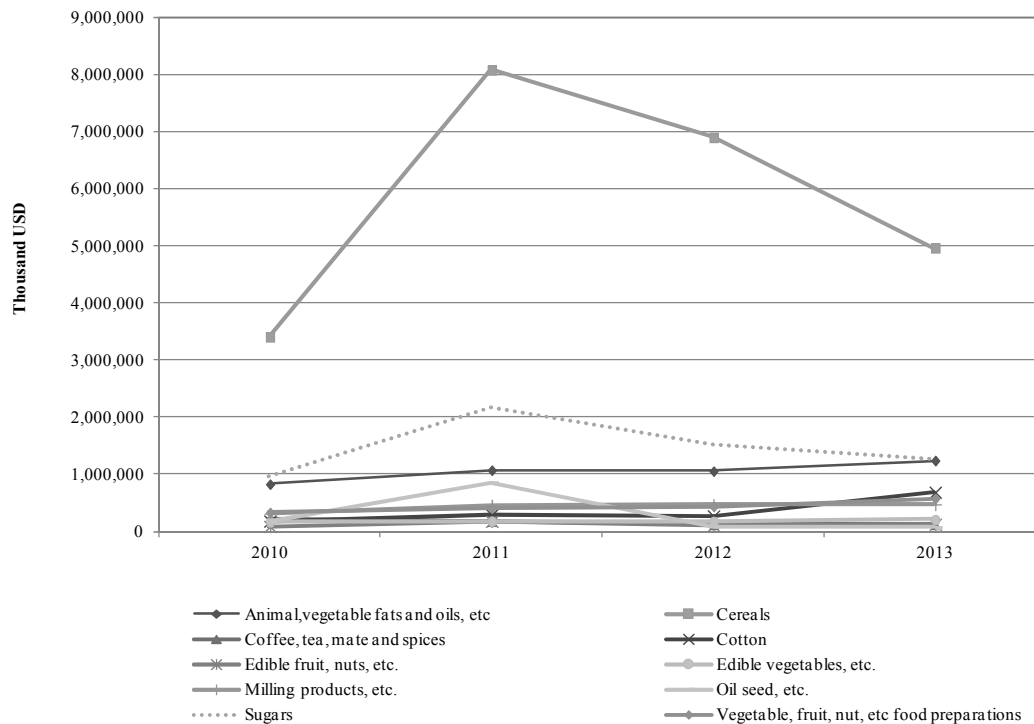


Fig. 3.3.4 Change of the Import Value of Agricultural Products of the ECOWAS Region

Source: Made from data of the “Trade Map” by the JICA team
 Note: Data before 2009 were not available.

The proportion of each agricultural product in the import value of agricultural products of the ECOWAS region in 2013 are shown in the figure below. The import value of agricultural products was about 9.7 billion USD in 2013. In the import of agricultural products in the ECOWAS region, the proportion of the import value of cereals accounted for around half (51%). Following that, sugar and animal fats and vegetable oils accounted for 13%, respectively.

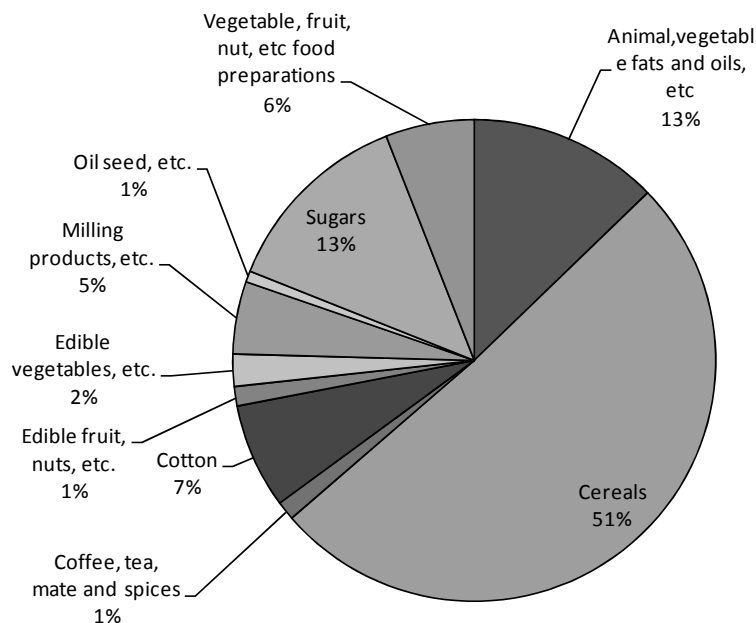


Fig. 3.3.5 Proportion of Each Agricultural Product in the Import Value of Agricultural Products of the ECOWAS Region (2013)

Source: Made from data of the “Trade Map” by the JICA team

In the ECOWAS region, cereals that are staple foods are major in the import. Following it, sugar and fats and oils that are necessary as basic food are imported. Import values of vegetables that are also necessary food stuffs are small since they are basically produced and consumed in the countries. However, it is assumed that there are periods of shortage since the harvest periods are limited and the products cannot be stored for a long time. Therefore, it is assumed that the vegetables are imported mainly during the shortage period.

3.3.4 Characteristics

Population of the ECOWAS countries was 327 million people in 2013. The population scale was a bit smaller than that of the Middle East region. However, the market is expected as a promising market in future since the population increase rate is high and the economic growth is also high (5 to 7% annually). Although import agricultural products are mainly cereals that are staple foods, fresh foods such as vegetables are also imported. Irrigation agriculture under semi-dry condition such as Burkina Faso has advantages on vegetable and bean production in comparison with wet and high precipitation condition. Burkina Faso and the neighboring countries have similar food culture and it makes easy to produce the crops demanded. In addition, since there is a tariff free agreement, etc., the ECOWAS market is a promising market.

Moreover, there are countries that have large population of the middle class in the ECOWAS countries. Although the population of middle class in Burkina Faso was 2.1 million people in 2010, those in Ghana and Cote d’Ivoire were from 7 to 11.3 million people, which are about 3 to 5 times of that of Burkina Faso. It is assumed that the middle class will move to upper class and the population of middle class will increase with economic growth and population increase in future. Therefore, it is expected that the ECOWAS countries are promising market in which consumption of luxury and high quality goods will increase.

3.4 Domestic Market

3.4.1 Population Change

Although the population of Burkina Faso was about 12.7 million people in 2003, it increased 1.34 times of that in 2013 (about 17 million people). The annual population increase rates ranged from 2.9 to 3.0% and they were a little higher than those of the ECOWAS region. It is expected that the population will quickly increase in future.

Table 3.4.1 Population Change in Burkina Faso

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population (thousands)	12,659	13,034	13,422	13,822	14,235	14,660	15,095	15,540	15,995	16,460	16,935
Population Increase Rate	2.9%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	2.9%	2.9%	2.9%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team

3.4.2 GDP

The real GDP of Burkina Faso in 2013 was about 1.80 times of that in 2003 (about 8.6 billion USD). Although the annual increase rates fluctuated from 3.0 to 9.5%, they were relatively high.

The real GDP per capita was 510 USD in 2013 and it increased 1.34 times of that in 2003. However, it was about 60% of that of the ECOWAS region (843 USD) in 2013. The increase rates fluctuated from 0.0% to 6.4% and they were lower than that of the ECOWAS region.

Table 3.4.2 Change of GDP and GDP per Capita in Burkina Faso

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
GDP (billion USD) (constant 2005 USD)	4.81	5.03	5.46	5.83	6.04	6.39	6.58	7.11	7.40	8.11	8.64
GDP Increase Rate (constant 2005 USD)	7.8%	4.5%	8.7%	6.8%	3.6%	5.8%	3.0%	7.9%	4.2%	9.5%	6.5%
GDP per Capita (USD) (constant 2005 USD)	380	386	407	422	424	436	436	457	463	493	510
GDP per Capita Increase Rate (constant 2005 USD)	4.7%	1.5%	5.5%	3.7%	0.6%	2.7%	0.0%	4.8%	1.2%	6.4%	3.5%

Source: Made from data of the “World Development Indicators, World Bank” by the JICA team

3.4.3 Import of Agricultural Products

The change of the import value of agricultural products of Burkina Faso is shown in the figure below. The total value was 335 million USD in 2013. The import value of cereals was the highest and the value has been increasing a lot in recent years. The import value of sugar, milling products and animal fats and vegetable oils followed it. Although the import values of them are less than that of cereals, they are increasing. These are basic food stuffs, and it is assumed that the consumption has increased with the population increase.

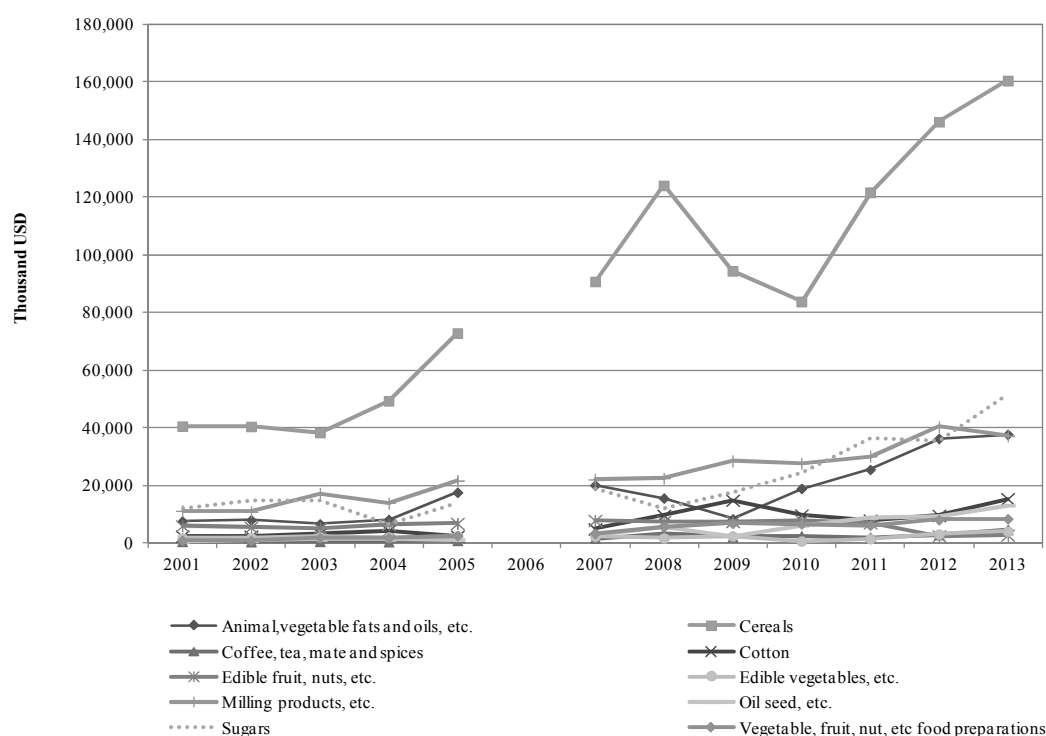


Fig. 3.4.1 Change of Import Value of Agricultural Products of Burkina Faso

Source: Made from data of “Trade Map” by the JICA team

The proportion of each agricultural product in the import value of agricultural products in 2013 is shown in the figure below. As mentioned above, the proportion of cereals was the highest and accounted for 48%. Following it, the percentage of sugar, milling products and fats and vegetable oils were 15%, 11% and 11% respectively. This is almost same as the trend of ECOWAS region.

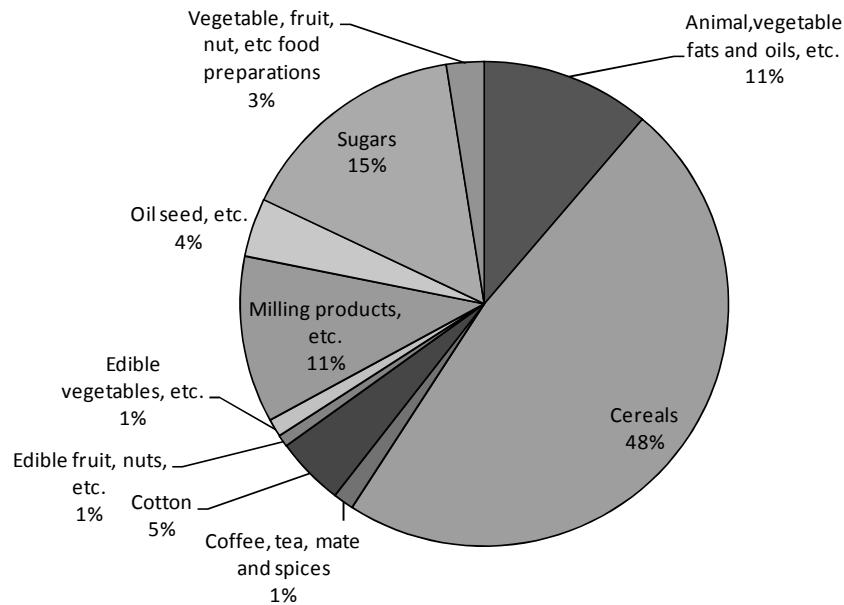


Fig. 3.4.2 Proportion of Each Agricultural Product in the Import Value of Agricultural Products of Burkina Faso (2013)

Source: Made from data of the "Trade Map" by the JICA team

3.4.4 Characteristics

In the import of agricultural products of Burkina Faso, share of cereals including rice is overwhelmingly large and it has increased since 2003. It accounts for around half of the total import value of agricultural products that was 335 million USD in 2013. Following it, import values of sugar, milling products and fats and vegetable oils are large.

Potatoes and onions that are large consumption vegetables are imported. As well as cereals, they are basic food stuffs and it is assumed that the consumption will increase with the population increase. Therefore, these basic food stuffs may be majors in the import of agricultural products for the moment. In addition, promotion of such agricultural products in the country is an important issue from the point of view of food security.

Chapter 4 Formation Process of the M/P

4.1 Selection of Target Agricultural Products and Value Chain Analysis

4.1.1 Main Principle

The main principles for selection of target agricultural products in this Project are as follow.

- a) Four target agricultural products are selected, and promotion plans for each agricultural product are formulated.
- b) In the early stage of the Project, the first selection of target products (potential agricultural products) is preceded and the second selection is implemented as the final selection after implementing several studies and analysis about the firstly selected agricultural products. The processes are as follows.
 - ① After basic information is collected and considered, and the selection criteria are set, eight products are selected among agricultural products that the Burkina government prioritizes, in the first selection.
 - ② Preliminary value chain (VC) surveys is implemented for the products selected in the first selection in order to understand the whole VCs and consider development issues and directions of the development
 - ③ Preliminarily, the feasibilities of the developmental directions for the first selected products are considered. And then 4 crops are finally selected in the second selection based on results of the preliminary VC surveys.
 - ④ In the selection, international market, sub-regional market and domestic market (import substitution products) are target markets. However, if crops are regarded to have high potentials or the unit prices for export are high, they are not removed in the early stage although the production or export quantities are small and information of the crops is not enough. These crops are added to target agricultural products that have potentials for development and incubation.
 - ⑤ In the second selection, a crop is selected as a potential product for development and incubation in addition to that for international market, sub-regional market and domestic market.

4.1.2 First Selection of the Target Agricultural Products

To decide population (group of candidate crops) of agricultural products to be considered, 23 crops, which are important crops on the policy as well as regarded to have high potential for development, were selected and listed through discussions in the taskforce meetings, etc. (Table 4.1.1). From these 23 crops, 2 crops were selected for each 3 target markets based on the 7 criteria mentioned below. In addition, 2 crops were selected as potential crops for development and incubation although the information is not enough.

- (a) Being priority/promising crops for export positioned by the government of Burkina Faso (SNE, SDFA)
- (b) Existence of international demand, particularly in EU, Maghreb and Middle East regions or in the sub-region
- (c) Whether the crops are exported from Burkina Faso, and there is a possibility to increase in the export
- (d) Whether there is a large quantity of imports of the crops to Burkina Faso, and they have possibility for import substitution
- (e) Profitability of the crops for producers
- (f) Production trend in Burkina Faso: increase rate in the past 10 years
- (g) Cultivation environment in Burkina Faso

Table 4.1.1 Matrix for the First Selection of Potential Agricultural Products

	Crops	Target Market	1) Being priority/promising crops for export positioned by the government of Burkina Faso	2) Existence of international demand, particularly in EU, Maghreb or Middle East regions or in the sub-region			3) Whether the crops are exported from Burkina Faso, and there is a possibility to increase in the export	4) Whether there is a large quantity of import of the crops to Burkina Faso, and they have possibility for import substitution	5) Profitability of the crops for producers		6) Production trend in Burkina Faso; increase rate in the past 10 years		7) Cultivation environment in Burkina Faso		Total Marks	Selection	Notes	
				Mark	Mark	Mark			Mark	Mark	Mark	Mark	Mark					
Inter-national Market	Mango	Europe, Maghreb/Middle East	⊙	Much	3	Middle	2		Middle	2	175%	2	Good	2	11	○		
	Sesame	Europe, Asia	⊙	Middle	2	Much	3		Much	3	570%	3	Good	2	13	○		
	Cashew nut	Asia, Europe, Maghreb/Middle East	○	Middle	2	Middle	2		Middle	2	135%	1	Good	2	9			
Sub-regional Market	Cowpea	Sub-region, Burkina Faso	○	Much	3	Much	3		Middle	2	134%	1	Excellent	3	12	○		
	Maize	Sub-region, Burkina Faso	○	A little	1	A little	1		A little	1	165%	1	Good	2	6			
	Peanut	Sub-region, Burkina Faso, Europe	○	A little	1	A little	1		A little	1	82%	0	Good	2	5			
	Tomato	Sub-region, Burkina Faso	○	Middle	2	Middle	2		A little	1	108%	1	Acceptable	1	7	○		
Domestic Market	Rice	Burkina Faso	○					Much	3	A little	1	270%	2	Acceptable	1	7	○	
	Onion	Burkina Faso, Sub-region	⊙					Much	3	Middle	2	98%	0	Acceptable	1	6	○	
	Banana	Burkina Faso, Sub-region	○					A little	1	Middle	2	na			0	3		Much irrigation water
	Cassava	Burkina Faso, Sub-region	○					A little	1	A little	1	140%	1	Good	2	5		Weak competitiveness
	Potato	Burkina Faso	○					A little	1	A little	1	180%	2		0	4		Irrigation, Difficult to procure seed
	Yam	Burkina Faso	○					0										Removing self-sufficiency crops
	Sorghum	Burkina Faso	○					0										Removing self-sufficiency crops
	Millet	Burkina Faso	○					0										Removing self-sufficiency crops
	Product Development and Incubation	Soybean	Sub-region, Burkina Faso	○	Middle							910%		Good				△
Capsicum		Europe, Maghreb/Middle East, Sub-region	○	Much							76%		Good					
Strawberry		Sub-region, Burkina Faso		Niche							na		Acceptable				△	
Ginger		Maghreb/Middle East, Asia		Middle							na		Good					
Chrysanthellum		Europe, Asia		Niche							na		Good					
Tiger nut		Europe (Spain), Asia		Niche							na		Good					
Bissap		Europe, Asia		Niche							na		Excellent					
Kinkeliba		Europe, Asia		Niche							na		Excellent					

Note 1 1) All priority crops in SNE and promising VCs (crops) in SNDFA are listed (total 17 crops). Former one ⊙, latter one ○.

2) Import quantity of Europe, Middle East and Sub-region which are near Burkina Faso; Much 3, Middle 2, Niche 1

3) Crops for export and possibility to increase the export more in future; Much 3, Middle 2, A little 1

4) Importing much by Burkina Faso and possibility of import substitutes in Burkina Faso; Much 3, Middle 2, A little 1

5) Profitability for producers is based on experience of MASA.

6) Increase rate of production quantity from 2002 to 2011; High 3, Middle 2, Low 1

7) Suitability of cultivation condition in Burkina Faso such as necessity of irrigation, easiness of the cultivation etc.; Suitable is Excellent 3, Middle is good 2, Conditionally suitable is acceptable 1

Note 2 Crops for development and incubation are not removed at present and they are draft to be considered whether they can be developed. △ is promising candidate crop.

Based on the above matrix, total 8 crops were selected. Mango and sesame are for international market, cowpea and tomato are for sub-regional market, rice and onion are for domestic market (import substitutes) and soybean and strawberry are as potential crops for development and incubation. The result of the first selection was approved in the first JCC meeting held on 12 June 2013.

4.1.3 Preliminary Value Chain Survey

Preliminary surveys of VCs were implemented for the 8 crops selected in the first selection. The outputs of the survey were used for the second selection of target crops, the detailed studies and value chains analysis. The objectives and outputs of the preliminary surveys of VCs are shown in the table below.

Table 4.1.2 Objectives and Outputs of the Preliminary VC Survey

Objectives	Outputs
1. Understanding overviews of production, post-harvest/processing, distribution, trade of the candidate target crops	Understandings of present VCs of the crops Plans for directions of the development (hypotheses) Judgment materials for the second selection of potential agricultural products
2. Understanding visible problems, causes and constraints Considering solutions for the causes, constraints and the feasibility Considering new products based on market demand	

Survey items in the preliminary studies of VCs are shown below. However, specific survey items vary by agricultural products, target markets, production areas and so on. Therefore, survey items, which are necessary to understand the whole VCs and consider directions for the development, were added as required. In the preliminary surveys, there are two surveys, namely the survey for each agricultural product and the cross-cutting survey across agricultural products.

Table 4.1.3 Survey Items for Preliminary Survey of VCs

Field	Survey Items for Each Agricultural Product
Cultivation	Cultivation areas, cultivation scales, breeds, cropping seasons, production amount, cultivation and harvesting techniques, cultivation conditions, natural environments, input materials, production prices, sales prices
Post-harvest processing, Processing	Careful selection and selection methods, storing methods, handling amount, production amount, quality control, proceeding techniques, packing, equipments and materials, facilities, production prices, sales prices
Distribution, Sale	Collection and distribution channels, sale destination, sales volume, market trend, product standards, price formation, infrastructure, transportation modes, payment methods, transportation and selling cost, export and import volume
Producers' organization, traders' organizations	Scales of organizations, contents of activities, funds, constraints
Assistance policies and systems	Promotion plans, related projects, subsidy systems
Field	Cross-cutting Survey Items for Agricultural Products
Export policies/systems	Custom policies /systems, inspection policies/systems, payment methods, infrastructure for exporting, export promotion/embargo policies
Supporting activities/ assistance policies	Technical assistance, funding procurement, subsidy policies, material and equipment provision, promotion policies, research and development policies, diffusion systems, supporting schemes for producers' organizations
Related policies/laws	Quality standards, certification policies and systems, hygiene standards, sanitary inspection systems, cooperative registration systems

The survey methods included collections of existing information, interviews with related governmental organizations, producers’ organizations, traders and processors. In addition, objects of the survey covered from production to sale processes, and the field verification was also carried out.

4.1.4 Categorization of Selected Agricultural Products

Based on the results of preliminary surveys of VCs, the selected agricultural products in the first selection were analyzed. The results are shown in the table below.

Table 4.1.4 Characteristics of the Selected Agricultural Products

Target Market	Selected Agricultural Products	Characteristics
International market	Mango Sesame	<ul style="list-style-type: none"> • They have export records to international markets • There are many competing countries • They are mainly produced for sales. • There is room to improve the quality. • There is room to improve post harvesting and proceeding facilities
Regional market	Cowpea Tomato	<ul style="list-style-type: none"> • They have export records to regional markets. • Shipping quantities and prices have seasonal fluctuation. • They are important for daily diet of local people. • They are mainly produced for sales but also for self-consumption
Domestic market	Rice Onion	<ul style="list-style-type: none"> • These are imported. • There is an increasing trend for the production amount • They are important for dairy diet of local people. • They are mainly produced for sales but also for self-consumption
Development and incubation	Soybean Strawberry	<ul style="list-style-type: none"> • The production amount is small, and there is little experience for the production. • There is a potential to increase in demand. • There is consumption in neighboring countries. • Trading chains are underdeveloped.

4.1.5 The Second Selection of the Target Agricultural Products

In the second selection of potential agricultural products, directions of development, possibility and validity of project implementation, assistance situations by donors, and coming assistance in the future were comprehensively taken into consideration. The results of the second selection are shown in the table below.

Table 4.1.5 Results of the Second Selection

Target Market	Results of the Second Selection	Consideration Result of the First Selection of Crops
International Market	Mango	<p>[Mango] World Bank has provided assistances for improving the whole mango VCs. Introduction of a dryer for dried mango and development of mango farm, etc. have been supported by the World Bank, etc. However, there is no strategy of dried mango industry, and techniques and information for quality improvement are not enough. Therefore, supports for these are demanded. Regarding fresh mango, there is a possibility to open markets of non-EU Europe, Middle East and so on if considering a fruit fly and collecting quarantine information.</p> <p>[Sesame] Various supports are implemented by donors, NGOs, and so on and it is one of matured VCs. There is much demand of sesame for oil and food in the international market. Especially, high potential for export is expected because of a high demand of food sesame mainly in Asia. Because of this, JICA and MARHASA will support the sesame sector mainly for edible sesame seeds. Therefore, this Project does not deal with sesame.</p>

Target Market	Results of the Second Selection	Consideration Result of the First Selection of Crops
Sub-regional Market	Strawberry	<p>[Strawberry] Although the economical impact is small, strawberry is one of specialty of Burkina Faso. Burkina Faso is the only country in West Africa that exports strawberry. It is expected that the demand in the sub-regional market will increase with economic growth. However, there are competitions with French and Moroccan ones in big cities such as Abidjan. Quality improvement, package improvement and stable supply are required, and these supports can increase the value of the brand of Burkina strawberry.</p> <p>[Cowpea] Cowpeas grow well in semi-arid area and the production quantity in Burkina Faso follows that in Nigeria and Niger. On the point of view of export promotion, Nigeria doesn't have enough production for export because of high domestic demand. Therefore, Niger is one of the competitors. However, cowpeas market is a sellers' market since the demand is high in the countries such as coastal counties in West Africa where the cultivation condition is not suitable for cowpeas. It has been confirmed that demand of cowpeas which are black eye, big and white skin is high. It is expected that cowpeas of Burkina Faso can keep the competitiveness in the market based mechanisms. And also, funding assistance by IITA and JIRCAS of Japan is implementing. Therefore, this Project does not take cowpeas.</p> <p>[Tomato] Following onion, the production quantity of tomato is second in vegetables. The production quantity of tomato has been stable in the past 10 years. The major export direction is Ghana. Although there is an upward trend in the production quantity of tomato in Ghana, possibility of stable export in future is expected because of the high demand on Burkina Faso.</p>
Domestic Market	Onion	<p>[Onion] The production quantity of onion is the most in vegetables in Burkina Faso. The production quantity of onion cultivated in dry season is increasing through support of irrigation cultivation by the World Bank and so on. On the other hand, the retail price rises from May to December in which distribution quantity of the dry season onion is decreasing. And also import quantity of foreign onions is increasing in that period. It is necessary to promote domestic onions production in the off season and support to increase the storability.</p> <p>[Rice] In case of rice sector, the whole rice VC has been supported by the World Bank, FAO, the Republic of China, GIZ, Bill & Melinda Gates Foundation, JICA and so on. The cultivation area and production quantity have been rapidly increasing. However, import quantity of rice is still large and promotion of domestic rice is an important issue. Japan government has been supporting the rice sector under the framework of TICA/CARD and support to the sector will continue in the future. Therefore, this Project does not deal with rice.</p>
Development and Incubation product	Soybean	<p>[Soybean] Although soybeans are new crops in Burkina Faso, the demand is rapidly increasing as material of feed for chicken in Burkina Faso and the sub-region. Processed foods of soybeans which have high nutritional value are also being paid attention and there is potential for small scale processing business. The soybean VC is not matured and prompt assistance is essential since there are severe competitions with foreign soybeans.</p>

Based on the result of consideration, 4 crops were selected in the second selection. The selected crops were mango for international market, strawberry for sub-regional market, onion for domestic market (import substitute) and soybeans for development and incubation products. The result of the second selection was approved in the second JCC meeting held on 26 November 2013.

4.1.6 Selection Flow

As previously mentioned, the 4 target crops (potential agricultural products) were selected through the 2 stages. The schematic flow chart is shown below.

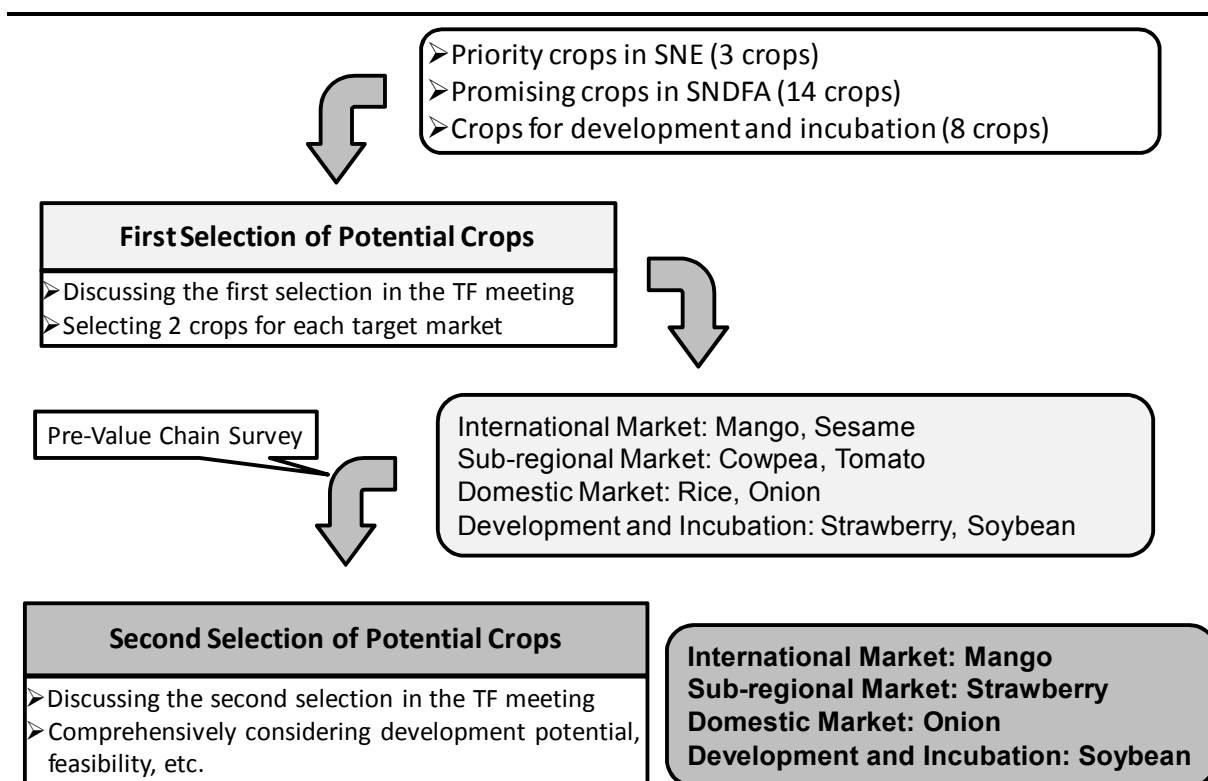


Fig. 4.1.1 Selection Flow of the Potential Agricultural Products

4.1.7 Value Chain Analysis

The value chain analysis was implemented for 4 products that were selected in the second selection. The objective and outputs are shown in the table below.

Table 4.1.6 Objective and Outputs of the Value Chain Analysis

Objective	Output
1 Detailed understanding and analysis for the VCs of target agricultural products Considering promotion issues Feasibility studies of problem-solving Considering validity of promotion measures	Results of analysis for the current VCs of agricultural products Promotion issues and measures

In the value chain analysis, supplementary surveys were implemented based on results of the preliminary surveys for VCs in order to understand current situations and VCs of the target agricultural products in detail. The survey methods and items were same with that for the preliminary surveys of VCs, and the survey was mainly information collection for considering promotion issues and measures of each target agricultural product.

Based on the results of preliminary surveys of VCs and the supplementary surveys, markets of the target agricultural products, production, processing and distribution channels, VCs, industry organizations, assistance situations by donors and governments were analyzed. In addition, promotion issues and measures were considered based on the results of the surveys and analysis.

During the last stage of analysis, stakeholder meetings were held among producers, processors, sellers, and person concerned in research institutions and governments. In the stakeholder meetings, results of the value chain analysis were shared among participants, and they discussed about promotion issues and measures.

Results of value chain analysis for 4 products selected in the second selection are summarized in Chapter 6 and after. In addition, results of preliminary surveys of VCs of sesame, cowpea, tomato and

rice, which were selected in the first selection but not in the second selection, are summarized in ANNEX.

4.2 Formulation of the Draft Promotion Plan for Agricultural Products (M/P)

4.2.1 Study and Analysis for Formation of the Draft Promotion Plan for Agricultural Products

In order to formulate the draft promotion plan for agricultural products, the basic surveys, preliminary surveys of VCs and value chain analysis were implemented.

In the basic survey, basic information and data about the agricultural sector, related industries, institutions, policies, related projects and neighboring markets were collected, and current situations were understood and analyzed. Furthermore, cross-cutting information such as cooperative policies, trading policies and systems, and quality standards were collected.

In addition, selection of the target agricultural products, the preliminary surveys of VCs, the value chain analysis were implemented. Through these activities, detailed current situation for the four target agricultural products were understood and analyzed, and promotion issues and measures were discussed.

4.2.2 Structure and Formulation of Draft Promotion Plans for Agricultural Products

The draft promotion plan of agricultural products is composed of promotion approaches for each market and draft plans for promotion projects for the four target agricultural products. Based on results of studies and analysis mentioned above, the draft promotion plan of agricultural products was formulated. As for onion and strawberry, information gained through preliminary pilot projects was also utilized as formulating draft plans for promotion projects.

Promotion approaches for each target market were formulated considering general characteristics of the target markets (international, regional and domestic market). The information about the markets characteristics were gained through analyzing results of basic surveys and preliminary studies of VCs.

Draft promotion plans for each target agricultural product are plans to realize the promotion measures that were made based on the value chain analysis. In each promotion plan, target periods, target areas and future visions were set as frameworks. In addition, several promotion strategies were established, and programs were prepared in order to realize the promotion strategies. Under each program, several projects are planned. In each project, objective, stakeholders and target groups, contents of activities and actors, and schedules and responsible organizations were designed.

During the formulation of draft promotion plans, outlines of the plans were shared and discussed in task force meetings and stakeholder meetings. Additionally, necessary points were reflected to the draft plans and the plans were revised.

4.3 Pilot Activities

4.3.1 Planning for Pilot Activities

(1) Purpose of Pilot Activities

After formulating the draft promotion plans of four agricultural products, some of activities in the promotion measures were implemented as pilot activities. Lessons learned through the pilot activities are reflected into the draft promotion plans in order to increase its feasibility.

Therefore, the purpose of pilot activities is to collect useful information and data that can increase the feasibility of promotion plans. Lessons and useful information gained through pilot activities were reflected into related programs or activities in the draft promotion plans.

(2) Positions of Pilot Activities for Formation of Promotion Plans of Agricultural Products

Pilot activities were implemented as one of formation processes for the promotion plan of agricultural products as shown below.

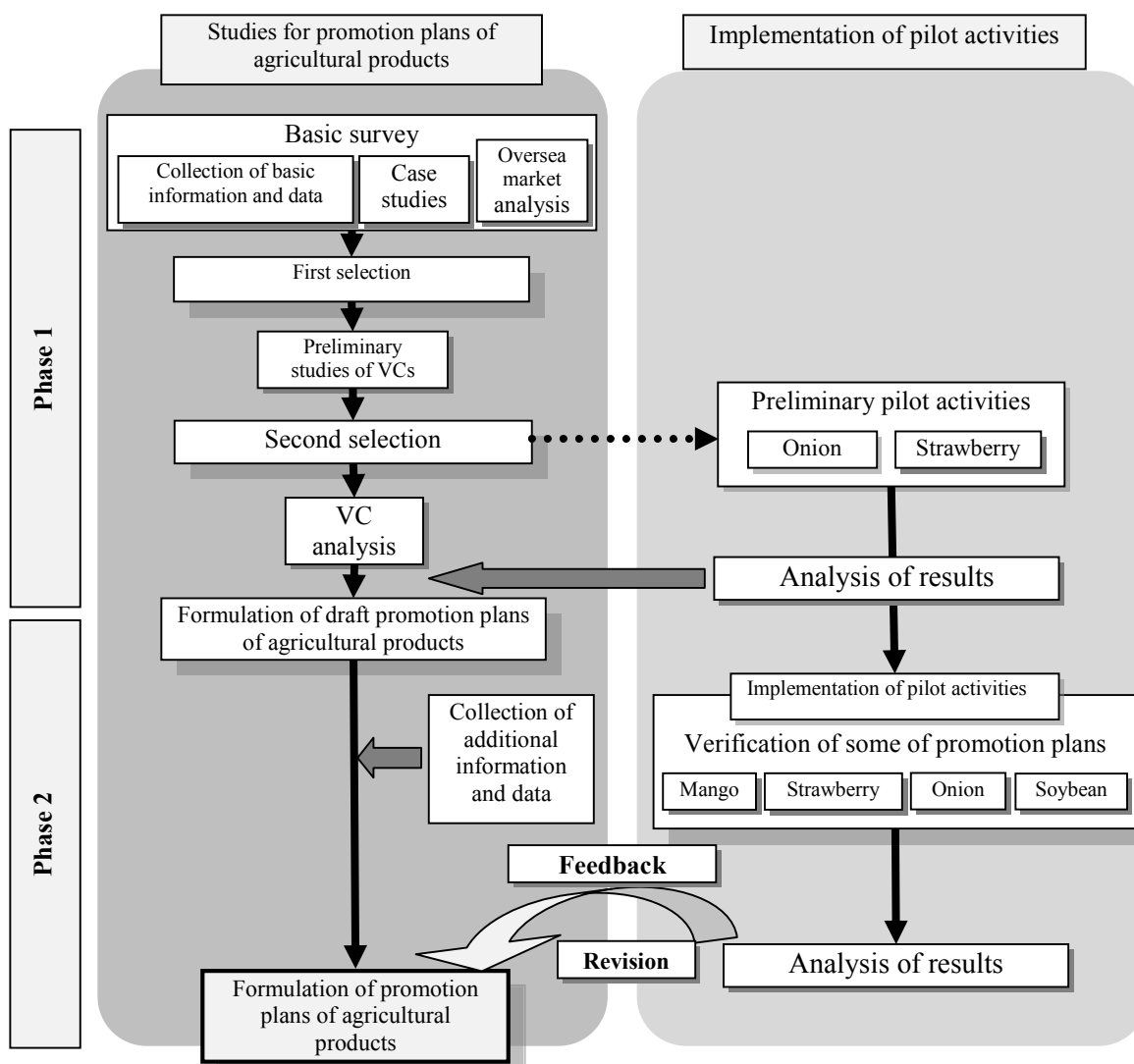


Fig. 4.3.1 Formation Processes for Promotion Plan of Agricultural Products and Relations with the Pilot Activities

(3) Relations between the Pilot Activities and the Promotion Plans of Each Agricultural Product

Considering points mentioned below, pilot activities were selected from the promotion measures through discussions in the task force meetings, and draft plans of pilot activities were designed.

1) Requirements for Pilot Activities

- These activities can produce results and lessons within the limited implementation period.
- These activities can be carried out without revisions of laws and systems.
- Existing organizations can be utilized in the pilot activities.
- Target stages from production to sales cannot be overlapped among the four agricultural products.

2) Verification Items in Pilot Activities

Taking into consideration points mentioned above, verification and confirmation items in pilot activities and relations with promotion plans are shown in the table below.

Table 4.3.1 Promotion Measures and Verification and Confirmation Items in Pilot Activities

Promotion Measures in the Draft Promotion Plans		Verification and Confirmation Items in Pilot Activities
1. Export promotion of dry mangoes		
	(1) Improvement of sanitary conditions/quality control	<ul style="list-style-type: none"> • Raising awareness about facilities improvement through learning from advanced cases • Improvement of facilities using local workers and materials • Contamination control and improvement of working efficiency • Browning prevention by antioxidant • Utilization of plastic trays in ATESTA dryers
	(2) Increase in productivity/profitability	<ul style="list-style-type: none"> • Considering the feasibility through learning from advanced cases • Solving problems of ATESTA dryers using Japanese industrial materials • Understanding needs of improvements of dryers and its cost
	(3) Finding market channels	<ul style="list-style-type: none"> • Possibility of assistances for market development through subsidy provision for oversea exhibitions • Improvement of the quality by improving ATESTA dryers
2. Prospecting markets, improvement of cultivation techniques, development of production area of strawberry		
	(1) Prospecting markets	<ul style="list-style-type: none"> • Entering upper-markets by improving post harvest and packing processes • Reduction of transport loss by improving harvesting and packing processes
	(2) Improvement of cultivation techniques	<ul style="list-style-type: none"> • Increase in production amount and the quality through introducing new seedlings • Changes in harvesting periods through introducing forcing cultivation
3. Rainy season onion production during off-crop seasons		
	(1) Improvement of cultivation techniques	<ul style="list-style-type: none"> • Productivity improvement through improving seeding, ridge making, and fertilization methods
	(2) Extension of cultivation	<ul style="list-style-type: none"> • Information sharing and awareness enhancement among neighboring producers and collectors through participation of field day
4. Promotion of small-scale businesses for soybeans products		
	(1) Strengthening knowledge and techniques about proceeding of tofu and related foods	<ul style="list-style-type: none"> • Improvement of nutrient composition and production quantity by using heating squeezing methods (soy milk production) • Improvement of taste of tofu through alteration of coagulating agents • Improvement of working efficiency by introducing new equipments • Utilization of food by-product from tofu • Market diversification and ensuring stable market

4.3.2 Implementation of Pilot Activities and Feedback to the Promotion Plans

In order to confirm verification items mentioned above, plans of pilot activities for each agricultural product were formulated. However, there are limited information about rainy season onion production and marketing of strawberry. Therefore, parts of pilot activities were initiated as preliminary pilot activities from 2013 in order to collect related information. Based on results of the preliminary pilot activities, plans of pilot activities were formulated. Furthermore, the plans of pilot activities were discussed in stakeholder meetings for each agricultural product.

Pilot activities were carried out during the period between May 2014 and March 2015. Main sites were the suburbs of Bobo-Dioulasso for mangoes, of Ouagadougou and Bobo-Dioulasso for strawberry, of Yako and Korsimoro for onions and of Léo for soybeans.

Pilot activities were implemented in cooperation with related organizations such as C/P organizations and cooperatives. The detail information of each pilot activity is mentioned in the Chapter 6 and after. In addition, lessons and useful information gained through the pilot activities were reflected into the draft promotion plans for each agricultural product in order to increase the feasibility, and promotion plans were designed.

Chapter 5 Position of the Master Plan (M/P) and Development Approach

5.1 Position of the Master Plan (M/P)

The PNSR, which is a top-priority national program in agricultural and rural development in Burkina Faso, has set the following vision, the overall goal and 5 strategic axes to achieve them.

Vision: “By 2025, agriculture in Burkina Faso will be modern, competitive, sustainable, and a driving force for economic growth, based on competitive small scale family farming¹ and agribusiness companies, which will provide to all Burkinabe the food to lead a healthy and active life.”

Overall goal: To contribute to enhancement of food security, nutritional improvement, sustainable and strong economic growth and poverty reduction.

Strategic axes:

Axis 1: Improvement of food security and food sovereignty

Axis 2: Increase of rural household income

Axis 3: Sustainable natural resources development

Axis 4: Increase of accesses to potable water and improvement of living conditions

Axis 5: Partnership development among actors in the rural sector

Objectives of the Master Plans, which is based on market oriented agriculture, are promotion of diversification of market oriented agricultural products and promotion of domestic agricultural products in order to compete with imported products. Therefore, in accordance with the PNSR overall goal and strategic axes, the development goal of the M/P is to “increase the rural household income through the promotion of market oriented agriculture”. It means that the M/P contributes to reaching the objective of the axis 2 in the PNSR that aims at increasing rural household income through promotion of market oriented agricultural products.

Under the leadership of the DGPER, MARHASA has elaborated the Strategy for Agricultural Value Chain² Development (SDFA)³ in 2012. In order to contribute to the achievement of the PNSR overall goal, the SDFA set the following implementation policies as the value chain development strategies: 1) Structure the stakeholder organizations for the value chains of each product, 2) Improve accessibility of credits for the stakeholders, 3) Add values to agricultural products by processing and storage, 4) Improve accessibility of techniques of cultivation and post-harvest, 5) Improve sales of agricultural products. In order to implement it, the SDFA proposes to set development approaches through the value chain approach. The SDFA also targets 12 priority agricultural products including food crops and cash crops: sorghum, millet, maize, rice, cassava, cotton, sesame, mangoes, onions, cow peas, soy beans and peanuts.

As mentioned in the chapter 4, promotion plans of 4 target agricultural products (mangoes, onions, soybeans, strawberries⁴) are formulated in this M/P. The M/P⁵ contributes to sub-program for “Axis 2: Increase of the rural household income” in the PNSR from a point of view of agricultural value chain development (promotion of agricultural products).

¹ The majority of the producers in Burkina Faso are small scale, family type farmers

² In the SDFA, the definition of filiere is that “whole value chain including whole economical activities from crop production, processing, distribution to sales”. It means that the filiere is a wider concept than value chain in Burkina Faso. In addition, filiere promotion in Burkina Faso aims at meeting needs of consumers.

³ As of February 2015, the SDFA had been validated in MARHASA and validation in a Cabinet meeting is under preparation.

⁴ Although strawberries are not included in the SDFA, they have been selected as a target product because they are a special product of Burkina Faso (see chapter 4).

⁵ The M/P should be validated as a policy of MARHASA in the Cabinet meeting after validation in MARHASA.

5.2 Composition of the Promotion Plan for Agricultural Products (M/P)

In the chapter 5, the political position of M/P is clarified and development approaches that explain the directions of M/P are described. From the chapter 6 to 9, promotion plans for the 4 target agricultural products are described. The chapter 6 is the promotion plan for mango targeting the international market. The chapter 7 is the promotion plan for strawberry targeting the sub-regional market (including the domestic market). The chapter 8 is the promotion plan for onion targeting the domestic market (including the sub-regional market). The chapter 9 is the promotion plan for soybeans targeting the domestic market (including sub-regional market). In each chapter, analysis of present situation and promotion issues, and promotion plans are described. Implementation structure to promote the M/P and recommendations are described in the chapter 10 and 11 respectively.

5.3 Development Approaches

5.3.1 Promotion of Market Oriented Agriculture

Under globalization, cotton exports highly contributed to the economic growth in Burkina Faso. However, it is essential to diversify agricultural products following cotton for further economic growth of Burkina Faso in future. In addition, “Competitive small scale family farming and agribusiness companies should be driving forces for economic growth” as mentioned in the vision of PNSR.

As mentioned in the PNSR, agriculture should be market oriented for the small scale family farming and agribusiness companies to strengthen competitiveness. Therefore, roles and issues of producers, processors, exporters in the chains are clarified through value chain analysis of the 4 target agricultural products. And then, the pilot activities are implemented and the promotion plans are formulated based on the concept of market oriented agriculture shown in the figure below.

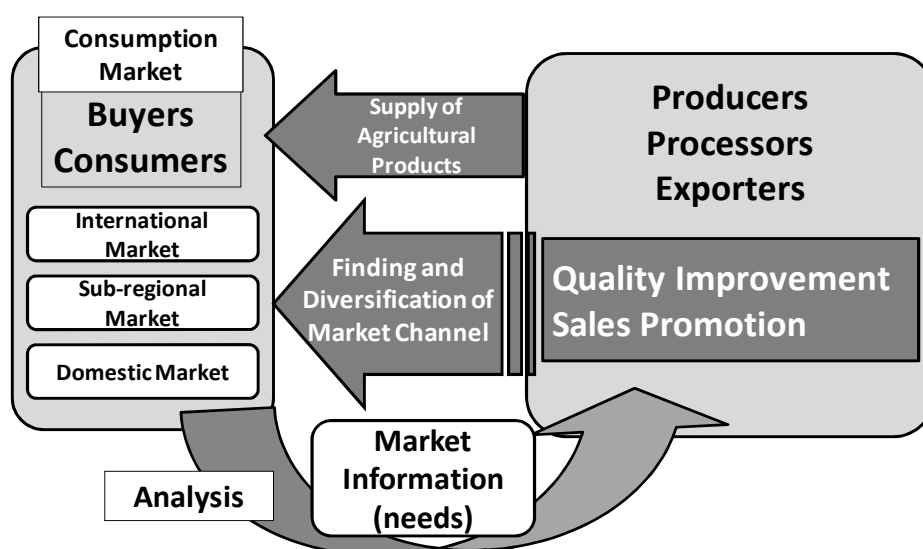


Fig. 5.3.1 Concept of the Market Oriented Agriculture in the Project

“The market oriented agriculture” in the Project is to produce and sell crops and processed products meeting needs of targeted markets as a business. Therefore, the qualities and characteristics of one agricultural product vary by different target markets, countries and consumers since there are different needs for a crop among them. Therefore, finding or targeting markets and understanding the market needs should be the starting point since sales or export quantity may not increase despite the productivity improvement. Basically, this point is same in international, sub-regional and domestic market.

For example, “trial cultivation of rainy season onions” implemented in the pilot activity of the Project was a measure for the following issue. In the off-season (from August to December) that is the second

half of rainy season, selling quantity of the domestic onions decreases and the selling price goes up with increase of quantity of import onions. It means the off-season is a promising period to sell domestic onions. It depends on whether domestic onions can be sold in the off-season in competition with the import onions. Although seed supply companies have been introducing onion seeds for rainy season cultivation since 3 years ago in Burkina Faso, the cultivation has not been extended. Through the value chain analysis, the reasons were identified. There were technical constraints on production stages, and information about the rainy season onions were not distributed among producers and traders. Furthermore, preference of consumers for onions was surveyed targeting at import onions (yellow) and rainy season onions (purple) in Burkina Faso. As a result, it was confirmed that Burkinabe prefer taste and color of the rainy season onions. Based on these, measures for the technical constraints on production stages were verified in the pilot activity. In addition, the impact of the measures for the growth of onions, the acceptability to producers and the profitability were confirmed.

The target markets and agricultural products in the Project are mangoes for the international market, strawberries for the sub-regional market and onions and soybeans for the domestic market. The reason to choose the 3 markets is that the needs are different by each market, and the promotion plans can be future models of market oriented agriculture for each market. For example, high quality and safety are often demanded in international market such as developed countries. On the other hand, the stable trade volume rather than the quality is usually demanded in domestic markets. Moreover, main actors who correspond needs of consumers or markets are not only producers but also processors or exporters if products are processed and exported.

5.3.2 Value Chain Approach

In the approach applied in this Project, target crops and markets were set at first. Stages and actors in the value chains to be intervened and improved were clarified in order to respond needs for the markets and increase in the value of Burkina's products. Generally, value chain development has several measures such as improvement of a bottleneck or improvement of the whole value chain. It varies by target agricultural products and processed products.

For example, issues of hygiene improvement, quality improvement, finding market channels, etc. were revealed through the value chain analysis of dry mangoes. Therefore, product improvement (improvement of production techniques) following requirements of new export destinations (Japanese market) were planned. In consideration with opinions of Japanese buyers, hygienic improvement in workshops, quality improvement, and improvement of product keeping were tried and samples were also made. As a result, trade with Japanese importer was started.

In the same way, through value chain analysis of strawberry, it was clarified that price of strawberry went down from a peak of harvest season in the domestic market, thus it is important to find market channels. Although the producers' group has a market channel to a local market in Abidjan, diversification of market channel was necessary since the market is channeled by only one wholesaler in the destination. In Abidjan, Cote d'Ivoire and Accra, Ghana, foreign supermarkets have been opened with development of the countries. In collaboration with Burkina's export company, a buyer of supermarket in Abidjan was invited to observe the production sites in February 2014. And they succeeded in trading with them. In collaboration with another Burkina's exporter and embassy of Burkina Faso in Accra, the Accra's supermarket made contracts with the producers for trading vegetables including strawberry. After that, another supermarket in Accra asked Burkina's Chamber of Commerce to introduce strawberry exporters.

In the examples of dried mango and strawberry mentioned above, finding new market channels were realized by collaboration between processors and exporters, producers and exporters, actors in the value chain and through public-private partnerships. Other than those, it was found that there were agricultural products that created new value in the value chains through collaboration with other industries or promotion of other industries. Although soybeans are new crops in Burkina Faso, it has small-scale but diversified value chains in the domestic market. Major value chains are for feed of

livestock (feed processing and livestock industry) and for processed foods (food for infants and processed foods related to tofu). In order to improve the whole value chain, it is important to connect consumers to value chains and enhance the value in each stage of production, processing, distribution and sales by connecting agriculture to other businesses such as a food industry.

However, the relation among actors in a value chain does not stand on only simple “win-win” relation. On the one side, they have cooperative relations aiming at achieving the same goal, namely expanding markets or enhancing values of Burkina’s products. On the other hand, they fight for the added value created by specialization relationships. In addition, domestic consumer market is not currently developed, and many parts of a value chain of agricultural business are not fully developed in Burkina Faso although there is some possibility to grow agricultural businesses. In such countries, it is necessary to ensure buyers in international market at first, and then to develop agricultural businesses covering from production to value adding processes.

5.3.3 Economic Growth and Value Chain

Agriculture is essential for economic growth in Africa. Generally, proportions of agriculture in GDP and in working population are also high. In Burkina Faso, the agriculture accounts for 30% of GDP and 85% of the working population (see the chapter 2). In case of countries highly depending on agriculture such as Burkina Faso, the improvement of agricultural productivity can contribute to economic growth (GDP) and benefit a large number of populations. It means that Burkina Faso have a cycle that the improvement of agricultural productivity can easily accelerate the growth of Burkina’s market and the economy. However, it is not easy to realize that situation. Therefore, it is important to promote agricultural products development by developing market oriented agriculture and value chains.

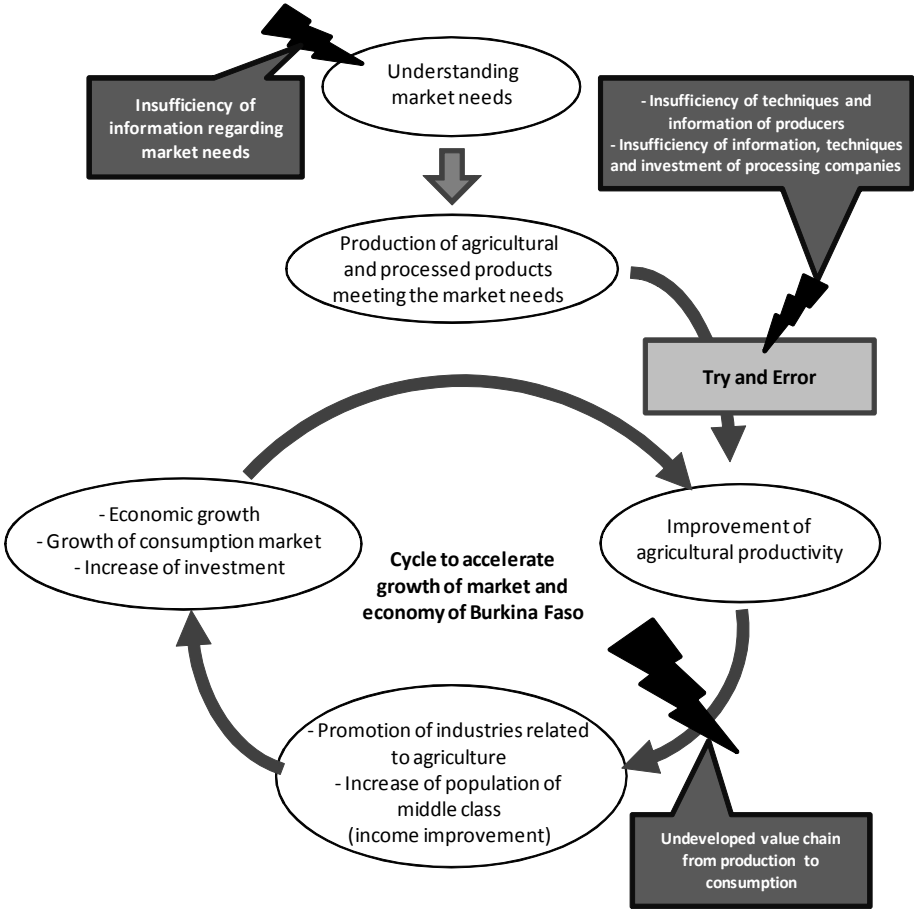


Fig. 5.3.2 Cycle to Accelerate Growth of Market and Economy of Burkina Faso

In the economic cycle system through promotion of agricultural products that is proposed in the Project, market needs (crops, target markets, market needs) are firstly understood following the principle of market oriented agriculture, and then productivity is improved following the market needs. By this way, in the case of soybeans, related industries such as feed industry or livestock industry are developed, household income in rural areas increase and people in rural area can move into the middle class. Expansion of the middle class and improvement of household income lead to diversification of consumption, increase of expenditure, growth of consumption market and increase of investment in related industries, and the agricultural productivity is further improved.

Currently, there are many constraints in the cycle shown in the Fig. 5.3.2. In the M/P, improvement is proposed in order to promote market oriented agriculture and solve issues on value chains of the target agricultural products.

5.3.4 Characteristics of the Target Markets

In this section, characteristics of exports of agricultural products of Burkina Faso are firstly described, and characteristics of the 3 target markets (international, sub-regional and domestic markets) are analyzed and summarized. Details of the characteristics of exports of agricultural products of Burkina Faso are mentioned in the chapter 3.

(1) Trends of Burkina's Agricultural Exports

In recent years, the export value of agricultural products of Burkina Faso has been increasing. Although Burkina's agricultural products were mainly exported to Africa between 2003 and 2005, exports towards Europe accounted for the largest share in the export value, about 52% in 2011. Exports to Asia have also increased since 2007 because of the increase of sesame export to Singapore.

Looking at export value by destinations of the agricultural products of Burkina Faso, almost all of export value is shared by Europe (52%), Asia (31%) and Africa (16%). However, Africa region includes North Africa (Maghreb region).

(2) Change of Export Values of Burkina's Each Agricultural Product and Trends of the Export Destination

Trends of agricultural products, which were exported to Europe, Asia and Africa, are analyzed. The characteristics by the regions are the followings.

- a) In exports to Europe, cotton accounts for about 60% of the export value, followed by fruits and oil seeds. It indicates either that Burkina Faso still cannot shift from the existing bulk product exports, or that the diversification of products for Europe has not been progressed.
- b) In exports to Asia, proportion of the export products was well balanced among cotton, fruits and oil seeds. However, proportion of the export value of cotton has been increasing in recent years (about 67%).
- c) In exports to Africa, a broad range of commodities are exported, such as oil seeds (41%), fruits (14%), cotton (22%), cereals (9%) and vegetables (8%). However, oil seeds and cotton are probably re-exported afterwards.

(3) Characteristics of the Target Markets

As mentioned above in (1), characteristics of exports of Burkina Faso's agricultural products have been analyzed and summarized. The characteristics of the three target markets of the M/P, namely international, sub-regional and domestic market, are analyzed. For the international market, the Europe market (EU), which represented more than half of the exports from Burkina Faso, and the Middle East/Maghreb markets, which are geographically close and have high GDP per capita, are analyzed.

ECOWAS region is analyzed as the sub-regional market.

1) EU Market

In the EU market, many kinds of products are imported. The population of the 28 countries in the EU was 500 million people in 2013. Whereas the GDP per capita is high, at about 29,000 USD, the population increase and economic growth have been stagnant. Therefore, the scales of this market will not expand further in future. However, this market has the largest economic scale among the 3 target markets looking at the total import values. Furthermore, there will be diversification of consumers' needs and creation of niche markets as increasing demands of safety or healthy-oriented food.

In the EU countries, there is a food system consisting of distribution of agricultural products and food related industry. As the food related industries, industries of food production, wholesale, retail sale and food restaurants have been developed. Therefore, product development using agricultural products and creation of demands are expected. In the EU market, niche markets of organic products such as organic cotton and organic soybeans⁶ have been created, and requirements on the quality and the safety are high. In addition, since population of elderly people has been increasing in the EU countries, it increases consumption of vegetables and fruits.

2) Middle East/Maghreb Markets

Population of the Middle East and Maghreb was 470 million people in 2012 and it is increasing. The GDP per capita is approximately 6,600 USD in the Middle East and 3,200 USD in the Maghreb. The Middle East/Maghreb market should grow larger in future. It is expected that development of the airline networks with Burkina Faso and corridors will reduce the distance to these markets in middle or long term.

In both areas, the import of cereals is large, representing about 40% of the total agricultural imports, but other various agricultural products are imported. Since the economy should grow in future, it is expected that the areas will be promising markets. Even if there are several arid areas where cereal production is not suitable in the Middle East/Maghreb areas, irrigated agriculture is developed and various products are cultivated in some countries. It means that this area consists of wide range of countries characterized by different economic scales and agricultural productions.

3) Sub-region Markets (ECOWAS)

The ECOWAS is an economic organization composed of 15 West-African countries. Based on the ECOWAS Trade Liberalization External Tariff, its members have followed a rule that sub-regional products are exempt from customs duty for commerce inside the ECOWAS. In 2013, ECOWAS population represents 327 million people, which is a little less than that of Middle East and Maghreb. However, its population growth rate is high and its economic growth is also high (5 to 7%), which makes the region a promising market. Although the main import agricultural products are staple foods such as cereals, fresh products such as vegetables, which are essential to daily diets in Africa, are also imported. Compared to areas where precipitation is large, areas under semi-arid climate such as Burkina Faso have advantages of irrigated agriculture of vegetables and beans. As their diets are close to Burkina Faso's, it is easy to grow demanded crops. In addition, since products are exempted from tariff, the sub-regional market is promising.

Furthermore, in ECOWAS countries, there are countries which have a large middle class population with certain purchasing power. According to the AfDB, although population of the middle class in

⁶ As example of BKB Burkina, it made a contract for cultivation of organic soybeans with producers' group and the price of soybeans was 30FCFA/kg higher than that of general soybeans. However, the organic soybeans require more labor force but the yield is low. Since the demand for soybeans is high and the yield relies on rain, the price of general soybeans sometimes goes up suddenly. Therefore, advantages of producers who cultivate organic soybeans by contract are often small.

Burkina Faso was 2.1 million people in 2010, Ghana and Cote d'Ivoire have estimate 7 million to 11.3 million people that was approximately 3 to 5 times of that in Burkina Faso (see the chapter 3). In future, along with economic and population growth, the middle class will shift to upper class and also become larger. It means that the sub-regional market is a promising market in which consumption of high end luxury products will increase.

4) Domestic Market

The imports of agricultural products of Burkina Faso are overwhelmingly composed of cereals including rice, and the value has rapidly increased since 2003. In 2013, it represented approximately half of the total import value reaching 335 million USD. Following the cereals, import values of sugar, milling products such as wheat flour, fats and vegetable oils are large.

Concerning vegetables which consumption volumes are large, potatoes and onions are imported. They are basic food stuffs like cereals in Burkina Faso and their consumption should increase with the population growth in future. Therefore, in order to ensure food security, the promotion of domestic products which can substitute for imported products is important.

5.3.5 Target Markets and Important Notices on Promotion

This M/P aims at promoting agricultural products on the three target markets which are international, sub-regional and domestic markets. Through the two selection processes mentioned in the chapter 4, the following 4 crops have been selected as the target crops.

Table 5.3.1 Target Markets and Crops

Target Markets	First Selection of the Target Crops	Second Selection of the Target Crops
International market	Mangoes, sesame	Mangoes
Sub-regional market	Cow peas, tomatoes	Strawberries
Domestic Market	Rice, onions	Onions, soy beans
Development and incubation	Soy beans, strawberries	

As the markets' characteristics are different, the approaches for the promotion of the agricultural products differ by each market. The characteristics of each market and approach are shown in the table below. Although the international market covers various different areas, based on the characteristics of the selected crops, it is supposed that the targeted markets are the EU and the Middle East/Maghreb areas.

Table 5.3.2 Market Characteristics and Promotion Approaches

Type	Market Characteristics	Promotion Approach
International	<p>[Market]</p> <ul style="list-style-type: none"> ◆ The international market covers various areas and countries such as Europe, the Middle East, Maghreb, etc. Their population, population growth rates, GDP per capita, economic growth rates, etc. differ in each area and country. The markets are diversified since their import of agricultural products, import quantity and needs are different each other. ◆ Demand for quality and safety is high ◆ Trading is possible at a high value even in small volumes. ◆ Distribution structure led by retailers ◆ High demands for tropical fruits, which production is difficult in Europe. ◆ Formulation of various niche markets in developed countries ◆ Various competitors (neighboring countries, Asia, South and Central America) 	<p>[Market]</p> <ul style="list-style-type: none"> ◆ Collecting information about quality and security standards in export markets ◆ Increasing the production of products corresponding to the above mentioned standards ◆ Differentiation from the competitors (advertising the strong points of the Burkina's products) ◆ Finding new markets channels ◆ Implementing particular measures for the regulations of importing countries ◆ Producing products meeting the needs in importing countries and product diversification
	<p>[Product]</p> <ul style="list-style-type: none"> ◆ Demands for edible sesame in Asia and for sesame oil in EU are increasing. ◆ Demand for tropical fruits including fresh mango is increasing in the world. ◆ Along with increasing demand for dietetic products, the demand for natural dried mangoes is expected to increase ◆ Rice exports from India are increasing. ◆ In Burkina Faso, rice consumption is increasing mainly in urban area, thus the import is increasing. 	<p>[Product]</p> <ul style="list-style-type: none"> ◆ For sesame, measures for residual pesticides and ensuring traceability are crucial. ◆ The variety of fresh mangoes cultivated in Burkina Faso is demanded, and measures against fruit flies are crucial. ◆ Since there are various consumer preferences for dried mangoes, it is important to meet needs of import destinations. ◆ For dry mangoes, improvement of production techniques, hygiene and quality control methods are required. ◆ It is essential to produce rice at low cost.
Sub-regional	<p>[Market]</p> <ul style="list-style-type: none"> ◆ Market expansion of agricultural products is expected with economic growth. ◆ Demand for quality and security is not high. ◆ Low prices (difficult to make profits with small quantities) ◆ No tariff is required within ECOWAS. ◆ Creation of new markets with the emergence of new supermarkets ◆ Trade infrastructure is still under-developed. ◆ Export considering differences of harvesting /distribution period of export destinations 	<p>[Market]</p> <ul style="list-style-type: none"> ◆ Collective sales of products through organizations ◆ Differentiation from competitors (advertisement of the Burkina's products, adjustment of sales periods, product differentiation in quality and prices) ◆ Finding new market channels ◆ Quality and packaging of products meeting needs of supermarkets ◆ Finding niche markets targeting the middle and upper classes
	<p>[Product]</p> <ul style="list-style-type: none"> ◆ Since there is only a few competitors for strawberries, there is potential for expansion of market channels. ◆ The competitors for onions are Niger in the dry season and the Netherlands in the rainy season. ◆ The competitor for soybeans is Brazil 	<p>[Product]</p> <ul style="list-style-type: none"> ◆ Adding value by sorting out strawberries for shipping ◆ Increasing production of rainy season onions ◆ Increasing production quantity of soybeans (including organic)
Domestic	<p>[Market]</p> <ul style="list-style-type: none"> ◆ From the point of view of food security, substituting agricultural imports by promoting national production is essential. ◆ Domestic consumer market is immature. ◆ Most parts of value chain are not developed. ◆ Demand for quality and security is low. ◆ Low prices (difficult to make profits with small quantities) ◆ Conservative eating habits ◆ Trade infrastructure is still immature 	<p>[Market]</p> <ul style="list-style-type: none"> ◆ Collective sales of products through organizations ◆ Differentiation from competitors (adjustment of sales periods, product differentiation in quality and prices) ◆ Increasing and stabilizing production ◆ Advertisements of new crops and products

Type	Market Characteristics	Promotion Approach
	[Product] <ul style="list-style-type: none"> ◆ There are insufficient domestic onions in the rainy season. ◆ Competitors for onions are Niger in the dry season and the Netherlands and Morocco in the rainy season ◆ There are insufficient domestic tomatoes in the rainy season. ◆ Although demand for soybeans is rapidly increasing in the county, the supply quantity is insufficient. 	[Product] <ul style="list-style-type: none"> ◆ Promoting rainy season onions ◆ Advancing production period of dry season onions ◆ Trying rainy season tomatoes

5.3.6 Characteristics of the Target Agricultural Products and Important Notices on Promotion

The 4 agricultural products selected as the target agricultural products are mango (fruit), strawberry (fruit), onion (vegetable) and soybean (processing material). Except soybeans, they are horticultural crops. Although major target markets of the horticultural crops are niche markets, it is said that the profitability is better than that of bulk type crops (cotton, coffee, tea, soybean, etc.). On the other hand, soybean is a bulk type export crop. However, Burkina's soybean is not targeted for the international market. It can be used for processing materials in the country, thus it contributes to promotion of industries of feed processing, livestock and small scale food processing.

Market trends of the target agricultural products, structures of value chain, benefits to small scale producers and important notices on promotion are shown in the table below. It is better to examine following points in the table below when other agricultural products except for target agricultural products are promoted.

Table 5.3.3 Characteristics of the Target Agricultural Products and Important Notices on Promotion

Crop	Target Market	Group of Crop	Market Trend	Value Chain Structure	Benefit to Small Scale Producers	Important Notice on Promotion
Mango	International	Fruit	Major production areas of mango in the world are Asia and South America. They are exported to developed countries. From Burkina Faso, dry mango is exported to Europe and fresh mango is exported to Europe, Mediterranean and Persian Gulf countries.	Vertical integration led by exporters for fresh mango Production of dry mango by small scale companies	Farm of small scale producers Employment of small scale producers by a part of commercial farms	Meeting needs of importers is crucial for dried mango. Measures for fruit flies are difficult.

Crop	Target Market	Group of Crop	Market Trend	Value Chain Structure	Benefit to Small Scale Producers	Important Notice on Promotion
Strawberry	Sub-regional Domestic	Fruit	Only Burkina Faso and Senegal produce it. Supermarkets in the sub-region import it from Europe.	In the domestic market, networks among producers, wholesalers and retailers are strong. The producers have original market channels for the sub-regional market.	Production by small scale producers	Considering the existing market channels, entering to supermarkets dealing with new high value added products It is possible to apply the experience on the strawberry to vegetables In medium term, pre-cooling facilities are considered for fresh vegetables including strawberry.
Onion (rainy season)	Domestic Sub-regional	Vegetable	Netherlands is the largest onion export country in the world. In the domestic market, onion price goes up from August to December in the second half of rainy season and just after the rainy season.	Networks among producers, collectors and wholesalers exist	Production by small scale producers	Poor small scale producers in the northern part are target of the production of rainy season onions. Market channels for the dry season onions can be used for sales of the rain season onions.
Soybean	Domestic	Processing Material	International price is going up because of increase of demand for feed material in the world. Demand for feed material for chicken is increasing in Burkina Faso.	Although several value chains exist, main value chains are for the domestic markets. The main structure is a flow from producers, collectors in production areas, processors to consumers (livestock growers).	Production by small scale producers A part of cultivation is by contracts.	Stable supply of soybeans can promote industries such as livestock, feed processing and small scale food processing.

Chapter 6 Model for International Market: Mango

6.1 Analysis of Present Situation

6.1.1 Target Market

The value chains of mango differ according to the type of product (fresh or processed) and the end market. Those value chains are classified as follows.

Table 6.1.1 Value Chains Classification

Type of Product	End Market	Characteristic
1) Fresh mango	Europe Mediterranean countries Persian Gulf countries	Vertically integrated under the initiative of exporters
2) Fresh mango	Neighboring countries Domestic market	Traditional mode of marketing / business
3) Processed product: Dried mango	Europe Neighboring countries* Domestic market	Production by the small-scale companies (cottage industry)
4) Processed product: Nectar, Puree	Neighboring countries Domestic market (Europe**)	Production and distribution by a large-scale company (DAFANI)

*: Very little, **: These products is not exported to Europe currently.

(1) Fresh Mango

1) European Market

The mangoes are exported to the European (EU-27) market from many countries in the world and annual volume reached with 276,000 tons in 2011 (EUROSTAT). The supply seasons vary according to the growing place and the variety. Burkina mangoes (also mangoes of Mali and Cote d'Ivoire) are exported to Europe for the period of March/April until June.

The Burkina's competitors in the EU market are Brazil, Peru (compete in March/April) and the United States. Senegal mangoes do not compete since the harvest season is different.

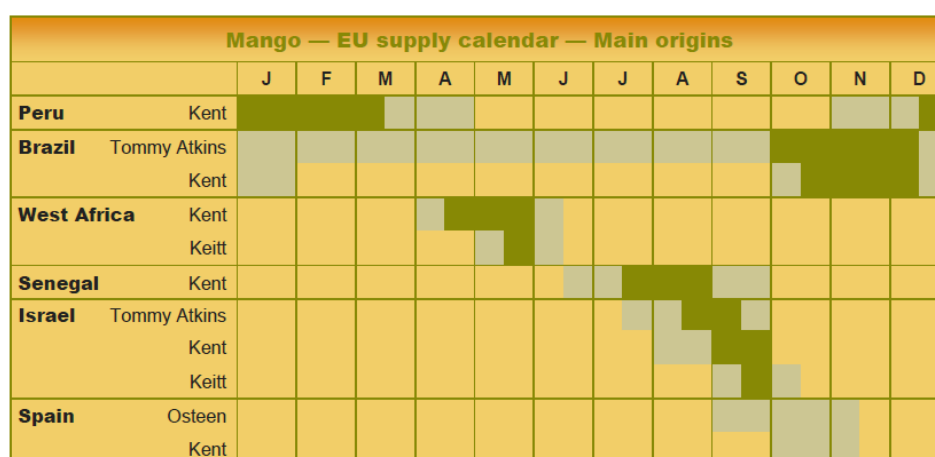


Fig. 6.1.1 Mango Export Calendar to EU Market

Source: Fruitrop No.186

The annual volumes of mango export from Burkina Faso to the EU-27 were 2,000 to 3,300 tons according to EUROSTAT. The total export volumes from Burkina Faso, Mali and Cote d'Ivoire were approximately 14,000 to 22,000 tons a year, and the share occupied by these 3 countries were

5 to 10% of annual importation by EU-27. Among these 3 countries, Cote d'Ivoire's export is predominant. The reduction in 2011 of these 3 countries was caused by the degradation of public order in Cote d'Ivoire.

Table 6.1.2 Mango Export to EU Market by Burkina Faso and the Adjoining Countries

[Unit: tons]

	2007		2008		2009		2010		2011	
EU-27 Import	226,292		244,256		213,796		244,480		275,749	
Burkina Faso - Export	3,191	1.4%	2,406	1.0%	1,988	0.9%	3,302	1.4%	2,129	0.8%
Cote d'Ivoire - Export	14,706	6.5%	11,250	4.6%	11,680	5.5%	11,323	4.6%	10,177	3.7%
Mali - Export	4,317	1.9%	4,902	2.0%	3,480	1.6%	3,672	1.5%	1,795	0.7%
Export of the three countries	22,214	9.8%	18,558	7.6%	17,148	8.0%	18,297	7.5%	14,101	5.1%

Source: EUROSATA (Fruitrop No. 209)

With regard to the export to the European countries (including Russia), the volumes to France has been decreased and the volumes to Netherlands who re-export the largest amount has been increased considerably; accounting for 74% in 2012.

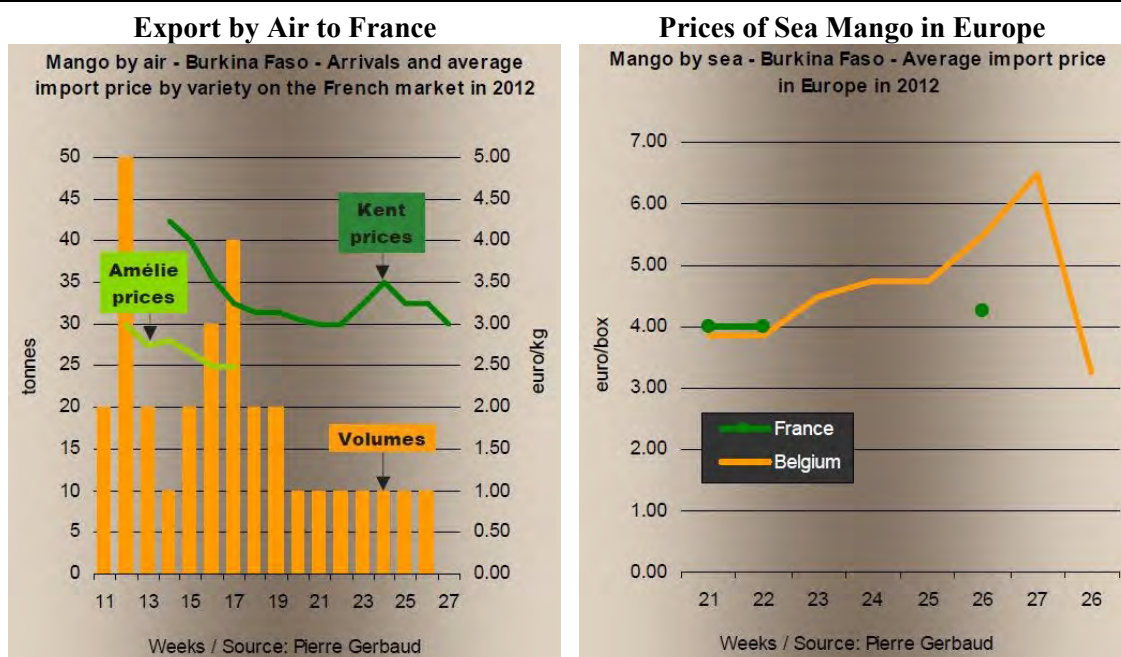
**Table 6.1.3 Mango Export by Burkina Faso to European Countries (2009 to 2012)
(including dried mangos export)**

	Export - Volume (ton)				Export - Value (million FCFA)			
	2009	2010	2011	2012	2009	2010	2011	2012
Netherlands	603.3	2,237.9	1,661.0	3,855.7	328.3	1,441.3	1,329.1	1,949.9
France	1,316.3	1,344.1	607.2	573.0	612.7	710.2	281.9	241.3
Germany	100.1	158.0	412.1	454.0	85.0	249.6	453.1	367.0
Belgium	484.7	5.0	328.9	145.4	229.8	26.9	298.3	215.9
Monaco	0.0	0.0	71.0	122.8	0.0	0.0	18.7	27.2
Spain	63.4	0.0	0.0	33.5	20.3	0.0	0.0	38.9
Russia	0.0	0.0	0.0	21.1	0.0	0.0	0.0	9.5
Albania	0.0	0.0	0.0	19.5	0.0	0.0	0.0	4.6
Other countries	71.4	12.1	2.4	2.8	66.0	45.6	3.9	4.6
Total	2,639.1	3,757.1	3,082.6	5,227.8	1,342.1	2,473.8	2,385.0	2,858.8

Burkina's customs statistics does not distinguish "fresh" and "dried"; both of them are covered by [HS 804501000 MANGUES, FRAICHES OU SECHES]. It could be one of reasons for the large difference in the figures of export volumes between the EUROSTAT and Burkina's customs statistics.

Source: Burkina's customs statistics

The following figures show the situations of export from Burkina Faso to France and Europe in 2012; by air and by sea. Burkina mango export to Europe starts in the mid-March with airfreight of early maturing variety Amélie. Amélie mangoes are not appreciated so much by the consumers and selling prices are lower compared to the Kent variety, since its outer color remains green after ripening. Kent mangoes are the major variety for export to Europe, and it starts in April by air. Sea export of Kent mangoes start at around the end of April - beginning of May, and it last until the middle/end of June. When the sea export starts air export is reduced and maintains a certain level. Fresh mango exports to Europe from Burkina Faso come to end in the middle-late June due to high risk of total losses at European ports caused by a detection of fruit-fly infestation in quarantine inspection, in addition, due to the starting of mango export from Senegal to Europe.



11th week: 11 March -, 17th week: 22 April -, 21st week: 20 Ma y-, 26th: 24 June -

Fig. 6.1.2 Mango Export from Burkina Faso to France by Air and Europe by Sea (2012)

Source: Fruitrop No.209

2) Markets of the Mediterranean Countries and the Persian Gulf Countries

The export volume to the Mediterranean countries and the Persian Gulf countries remains at low level; approximately 300 tons and the majority were exported to UAE and Morocco in 2012.

Lebanon was the largest importing country in 2009 and 2010 among these countries. However, Lebanon prohibited the importation of Burkina mangoes because of fruit-fly (*Ceratitis Cosyra*) and the exportation has been stopped since 2011. Ghana also had to stop exportation to Lebanon. However, Ghana has restarted the export after concluding a bilateral agreement with Lebanon and establishing pest free areas (15 mango farms).

Table 6.1.4 Mango Export by Burkina Faso to the Mediterranean and Persian Gulf Countries (2009 to 2012)

	Export - Volume (ton)				Export - Value (million FCFA)			
	2009	2010	2011	2012	2009	2010	2011	2012
UAE	0.0	0.0	0.0	180.0	0.0	0.0	0.0	4.1
Koweit	0.0	0.0	0.0	3.3	0.0	0.0	0.0	5.7
Jordanie	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0
Lebanon	220.0	180.0	0.0	0.0	6.3	4.5	0.0	0.0
Morocco	147.8	63.4	96.0	140.2	81.1	39.5	62.7	32.8
Libya	3.0	0.0	0.0	9.5	1.4	0.0	0.0	5.4
Total	371	243	96	333	88.8	43.9	63.0	48.0

HS 804501000: MANGUES, FRAICHES OU SECHES

Source: Burkina's customs statistics

The exports of dried mangoes to the Mediterranean and Persian Gulf countries are insignificant; therefore, the figures in the above table can be considered exports of fresh mangoes.

3) Sub-regional Markets

With regard to the mango exports to sub-regional markets, Niger and Ghana are major outlets.

According to a Niger tradesman who comes to buy mangoes in Bobo-Dioulasso every year, some parts of mangoes are destined to Algerian markets via Niger. It is assumed that major buyers of Burkina mangoes in Ghana are the manufacturing companies of fresh-cut-fruits and dried mangoes for export.

The volume of export to Cote d'Ivoire is very limited according to the Burkina's customs statistics. Burkina's customs statistics data is considered of low-reliability; especially the cases of export to Cote d'Ivoire. The export volumes of other farm products (such as onion) to Cote d'Ivoire are also shown very small in the Burkina's customs statistics.

Table 6.1.5 Mango Export to the Sub-regional Countries (2009-2012)

	Export - Volume (ton)				Export - Value (million FCFA)			
	2009	2010	2011	2012	2009	2010	2011	2012
Niger	1,989.0	1,989.0	2,808.0	2,574.0	22.3	17.0	23.0	21.1
Ghana	21.6	420.6	932.0	613.0	114.2	15.7	42.4	38.9
Côte d'Ivoire	0.0	169.0	9.5	29.3	0.0	88.4	1.5	91.4
Gabon	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.6
Total	2,010.6	2,578.5	3,749.5	3,220.7	136.5	121.1	67.0	152.1

HS 804501000: MANGUES, FRAICHES OU SECHES

Source: Burkina's customs statistics

4) Trend of Mango Importation by the European, Mediterranean and Persian Gulf Countries

The imports by these countries became 1.3 times higher for the period between 2007 and 2011. This upward trend is expected to continue. In terms of volume, EU-27 and Persian Gulf countries are expected to increase the imports.

Table 6.1.6 Mango Imports by the European, Mediterranean and Persian Gulf Countries

	2007	2008	2009	2010	2011	2007=>2011 Rate of increase
EU-27	226,292	244,256	213,796	244,480	275,749	122%
Other Western European countries	9,787	11,508	10,671	13,398	14,731	151%
Other Eastern European countries	740	840	624	899	1,064	144%
Russia	4,517	6,123	4,480	7,416	7,488	166%
Mediterranean countries	6,877	5,640	4,819	6,294	7,515	109%
Persian Gulf countries	74,222	65,317	79,053	101,344	113,645	153%
Total	324,442	335,692	315,452	375,841	422,203	130%

Other Western European countries: Switzerland, Norway, Iceland

Other Eastern European countries: Ukraine, Croatia, Belarus

Mediterranean countries: Palestine, Lebanon, Morocco, Jordan, Turkey

Persian Gulf countries: Saudi Arabia, Oman, Iran, Bahrain, Qatar, Kuwait

Source: EUROSTAT, COMTRADE (Fruitrop No. 209)

(2) Dried Mango

Dried mangoes are produced primarily for the markets in the European countries (Switzerland, France, Germany, etc.). Only limited numbers of dried mango producers market their products in Ouagadougou and Abidjan. In 2013, export to a South-African dried fruits manufacturing company has commenced with the support of PAFASP (World Bank project).

Burkina Faso's dried mangoes are produced and exported to Europe as organic certified product and some are exported as fair-trade certified product. It has steady / firm buyers of Fairtrade and organic shops such as Claro (Swiss), OXFAM (Belgium), Solidar Monde (France), EZA (Austria), GEPA

(Germany) and RAPUNZEL (Germany).

The customs statistics, in many countries including Burkina Faso, do not separately indicate the figures of dried mango trades. Therefore, statistical figures of Burkina's export volume of dried mangoes are not available. According to the study report of KIT¹, export volumes of dried mangos were estimated at 608 tons in 2007, 489 tons in 2008 and 206 tons in 2009. According to the PTRAMAB, export volume of major exporters was computed 426 tons in 2011, however this figure did not cover all exporters; also it may include dried mangoes produced in Mali.

With the assumption that a processing yield ratio of 5%² and an export volume of 300 tons, 6,000 tons of fresh mangoes are processed and exported to overseas markets, and its volume is far higher than annual export volume of fresh mangoes to Europe.

1) Demand of Dried Mangoes in European Market

The importation of dried mangoes by EU-27 is estimated at 3,400 tons in 2012, and it remained at similar volume since 2005. In 2012, UK accounted for 43%, Germany for 14%, Swiss for 8%, France for 6% and Netherland for 5%. UK, largest market in Europe, imports it mainly as a material for food processing (cereal). It is said that more consumption as snack is expected if quality is improved³.

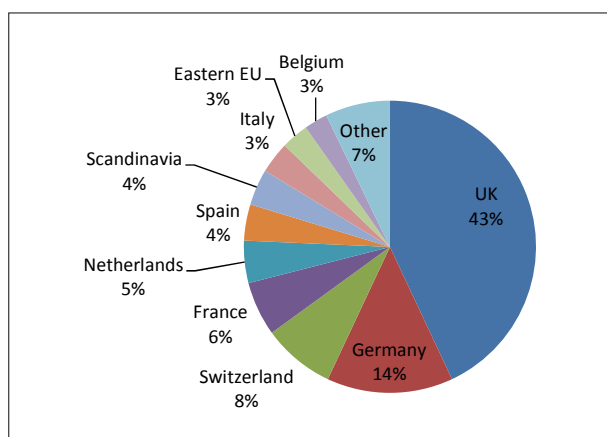


Fig. 6.1.3 EU Imports of Dried Mangoes (2012)

Source: The EU market for dried mangoes, Aug. 2014, CBI/Searce

About 50% of the demands are filled by South African products, about 35% are by the Thailand and Philippines products, and about 15% are filled by Mali and Burkina's products¹. It is estimated that 10 to 20% of the European demands for dried mangoes are for organic-certified products, and South Africa, Burkina Faso and Mali are the suppliers. Dried fruits of Thailand and Philippines are pre-sweetened products.

The manufacturing of dried mangoes in South Africa is at a larger scale and more advanced than that of Burkina Faso. The dried mango production in Mali was initiated in 2003 by NGO Helvetas; by introducing the same drying technique (dryers) as being used in Burkina Faso. After that, "Gebana Africa SARL" (Swiss capital exporter located in Burkina Faso) supported the producers in Mali to increase the production since exports to the European countries were expanding. In 2008 /2009, these products were not exported directly to Europe; but exported via the Burkinabe exporter.

¹ Affaire juteuse ou déception amère : quel est l'avenir des produits dérivés de la mangue au Burkina Faso et au Mali ? (2011), Institut Royal des Tropiques (KIT)

² Yield rate in dried processing varies according to the variety; Amélie is 6.7% (15kg of fruits produces 1kg of products) and Brooks is 4.5% (22kg of fruits produces 1kg of products)

³ The EU market for dried mangoes, August 2014, CBI/Searce

(3) Puree and Juice (Nectar)

The modern factory of DAFANI S.A., established in 2007 in Orodara, is an only mango processing facility of industrial level in the country. It has production lines of puree and juice. According to the KIT report⁴, it says that there existed 7 mango processing facilities of cottage or semi-industrial level in 2008 /2009, but few still functioning until now.

As shown in the following table, exports of mango juice are very limited during the period of 2009 to 2012. The production data of DAFANI S.A. is not obtained, but the Burkina's customs statistics says that there has been no exportation to Europe. The retail products of DAFANI juices (nectar) are marketed in the country now.

Table 6.1.7 Export of Mango Juice from Burkina Faso

	Volume of export (ton)				Value of export (million FCFA)			
	2009	2010	2011	2012	2009	2010	2011	2012
Cote d'Ivoire	27.5	0.0	0.0	33.5	13.9	0.0	0.0	18.4
Niger	24.4	0.0	0.0	9.0	12.0	0.0	0.0	3.6
United Kingdom	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Benin	11.4	0.0	0.0	0.0	6.3	0.0	0.0	0.0
Germany	0.0	0.0	1.7	0.0	0.0	0.0	0.8	0.0
Mali	7.7	0.3	0.0	0.0	4.1	1.5	0.0	0.0
Total	71.0	0.3	1.7	42.5	36.3	1.5	0.8	22.1

HS 2009803000: MANGO JUICES, NOT FERMENT, WITHOUT ADDITION OF ALCOHOL, WITH OR WITHOUT ADDITION OF SUGAR

Source: Burkina's customs statistics

As shown in the following table, the volume of mango juice importation is larger than that of exportation.

Table 6.1.8 Import of Mango Juice by Burkina Faso

	Volume of export (ton)				Value of export (million FCFA)			
	2009	2010	2011	2012	2009	2010	2011	2012
Ghana	0.0	0.0	170.4	163.6	0.0	0.0	25.9	24.1
Bangladesh	0.0	4.3	100.0	38.8	0.0	1.0	19.5	7.8
Egypt	3.9	3.8	0.0	12.9	0.5	1.1	0.0	1.6
Cote d'Ivoire	4.8	0.0	0.0	12.8	0.9	0.0	0.0	1.3
United Arab Emirates	0.0	0.0	6.2	7.4	0.0	0.0	1.5	0.9
China	0.0	0.0	12.6	4.0	0.0	0.0	1.4	0.9
Other countries	12.1	75.0	52.2	1.2	3.3	19.7	13.4	0.5
Total	20.8	83.2	341.4	240.7	4.7	21.8	61.7	37.2

HS 2009803000: MANGO JUICES, NOT FERMENT, WITHOUT ADDITION OF ALCOHOL, WITH OR WITHOUT ADDITION OF SUGAR

Source: Burkina's customs statistics

(4) Other Processed Products

There is no company which produces Cube IQF (Individually Quick Frozen) or fresh-cut-fruits in Burkina Faso. On the other hand, the manufacturer/exporter of fresh-cut-fruits (namely Blue Skies) in Ghana uses Burkina mangoes for raw material.

⁴ Affaire juteuse ou déception amère : quel est l'avenir des produits dérivés de la mangue au Burkina Faso et au Mali ? (2011) , Institut Rpyal des Tropiques (KIT)

6.1.2 Cultivation/Production

(1) Production Volume and Production Area

There are various estimate figures of mango production in the country. Indeed, volume of production varies according to the sources; such as 120,000 tons (PAFASP), 13,154 tons (FAO in 2011), 150,000 tons (MICA/SNE) or 333,145 tons (MARHASA). PAFASP estimates the production of export varieties (grafted mango trees) at 25,000 to 50,000 tons⁵.

The report of MARHASA (SITUATION DE REFERENCE DES PRINCIPALES FILIERES AGRICOLES AU BURKINA FASO, Version Finale, Avril 2013) shows the increase of mango productions as follows.

Table 6.1.9 Mango Production Volume

Year	Production (ton)
2008	115,730
2009	160,000
2010	243,286
2011	260,800

Source: DGPER Stat. 2011

The cultivation area of mangoes is estimated at 35,221 ha⁶, which account for about 25% of total area of fruits tree cultivation. It is said that one mango tree produces 97.8 kg of fruits on average⁷.

The major production area of mangoes is in the south-west part of the country where produces 70 to 80% of mangoes. The Kénédougou province is at the top followed by Houet, Comoé, Léraba and Sanguié provinces.

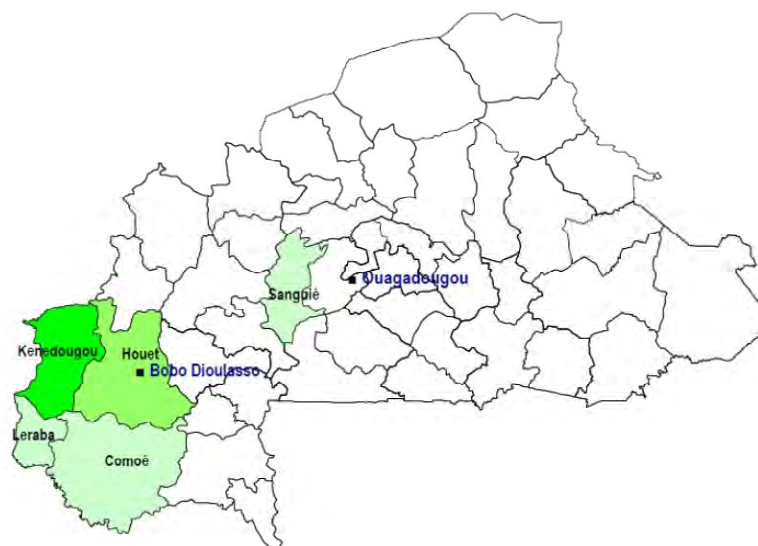


Fig. 6.1.4 Major Producing Areas of Mangoes

(2) Cultivated Varieties

It is says that there exist about 30 mango varieties in Burkina Faso. Among these, 6 varieties (Amélie, Kent, Keitt, Lippens, Springfields, and Brooks) are the principal economic varieties. The proportions of these economic varieties are Amélie 30%, Kent 20%, Keitt 10%, Lippens 10%, Springfields 5%,

⁵ <http://www.pafasp.org/mangue>

⁶ Tableau 7: Superficie en ha des espèces fruitières au niveau national, Rapport d'analyse du module arboriculture DPSAA juin 2011

⁷ Rapport d'analyse du module arboriculture DPSAA juin 2011

Brooks 20% and others 5%. The distributions of these varieties are not even. Amélie, Kent and Keitt are used for fresh exports to Europe, while Amélie, Lippens and Brooks are used for drying. The harvest periods of these varieties vary, and the mango season lasts for a fairly long period; from February to August. The peak period of harvest is between April and June.

Table 6.1.10 Harvest Time of Major Economic Varieties

	Feb	Mar	Apr	May	Jun	Jul	Aug
Amélie							
Kent							
Keitt							
Brooks							
Valencia							

Source: Le Guide d'exportation de la mangue Friche du Burkina Faso, PAFASP

(3) Producers and Mode of Production

The majority of mangoes are produced in small orchards by small-scale producers. Mango producers can be classified following 3 types⁸.

- a) Small-scale producers: Account for great majority of producers. Produce local varieties and non-grafted mangoes. Almost no particular care of trees/orchard is practiced and no investment.
- b) Intermediate-scale producers: Main suppliers of mangoes for export and for dried processing. 2 to 3 ha of orchard with economic varieties. Belong to producers' organization and profits by receiving the technical supports, GlobalGAP/Flocert certification by exporters/donors.
- c) Large-scale producers: Commercial farming by corporation

One can estimate that about 80% of mango orchards are mono-cultivation and remaining 20% are mixed-cultivation⁹. Mixed cultivation of cereal crops under/between mango trees is most popular, and pulse or cash crops are also grown¹⁰. Small-scale producers do not care for their orchards/trees and the areas where properly-managed mango orchards exist are limited.

In general, only about 20% of mango production meets exportable quality. In case of UPPFL/CO who provides mangoes to Fruiteq, about 10% of harvested fruits are for exports to Europe (top quality), about 20% are for local markets and for drying (intermediate quality) and the remaining 70% is low quality for local markets¹¹. Producer price of top quality is 3 to 4 times more than the price of low quality (100 - 120 FCFA/kg), price of intermediate quality is 40 - 50 FCFA/kg and price of low quality is 20 - 30 FCFA/kg. Durabilis (operator of SGTF packing facility in Bobo-Dioulasso; who also operates mango export business in Peru) evaluates that yield is low and ratio of exportable quality fruits is also low in Burkina Faso compared to Peru.

The mangoes for exports are harvested using a simple tool (tie up a small knife on wooden pole end) not to damage the fruits. As for mangoes for local markets, they are collected by a traditional method; climb a tree and shake a branch to let fruits drop.

(4) Problems on Cultivation/Production

The damages caused by fruit-flies (*Bactrocera invadens* and *Ceratitis capitata*) and bacterial disease (Bacterial Black Spot caused by *Xanthomonas campestris* pv. *Mangiferaeindicae*) are the most serious

⁸ Page web du PAFASP

⁹ Tableau 10: Proportion de la superficie des vergers par type d'association, ECONOMIE DE L'ARBORICULTURE FRUITIERE, RECENSEMENT GENERAL DE L'AGRICULTURE (RGA), 2006-2010

¹⁰ Rapport d'analyse du module arboriculture DPSAA juin 2011

¹¹ Rapid Impact Evaluation, Fruiteq - Burkina Faso, Root Capital, March 2013

problems of mango production.

Bactrocera invadens came to Africa from Asia around 2003/2004 and it causes very large problems in fresh export and dried mango production in Burkina Faso and adjoining countries. Fresh exports to Europe are forced to stop in mid/late June before the damages widespread (before onset of a full-fledged rainy season) in order to avoid the risk of total loss at European ports. In case of dry processing, 30 to 50% of collected raw materials are not usable for drying due to fruit-fly damages in case of late variety Brooks.

If a fruit-fly is found upon arrival by phytosanitary inspection at European ports, a whole container is rejected. According to the phytosanitary inspection office (DPVC) of Burkina Faso, such losses occurred 5 - 6 times in a year for Burkina Faso's mangoes. The amount of the loss rises with 30,000 euros per container. Integrated Tamale Fruit Company is a company established for fresh mango export in 1999 in Tamale/Ghana. This company had large losses by fruit-flies and stopped fresh exportation to Europe to avoid the risk, and turned into dried mango processor and exporter in 2010.

The cases of fruit-fly detection in the shipments from West Africa were 93 in 2012 and those are more frequent in June - July.

Table 6.1.11 Number of Cases of Fruit-fly Detection at European Ports

Origins	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
Cote d'Ivoire					3	12	18	1	34
Mali						3	11	1	15
Burkina Faso						3	8		11
Ghana	3	1	4	10	8	2			28
Senegal							1	1	2
Togo					1	1			2
Gambia							1		1
Total	3	1	4	10	12	21	39	3	93

Source: ECOWAS-TEN Value Chains Newsletter - Mango Newsfeed (Oct 2012)

The fruit flies are serious problem in regard to the promotion of mango exports, but the control of fruit flies is not an easy task. It requires a long-period and broad measures. The measures against fruit-flies have mostly been carried out by PAFASP in Burkina Faso. PAFASP implemented the financial supports for pest control chemical (grant of 90% for the price of SUCCESS APPAT¹²) and the orchards maintenance operation to reduce the population of fruit flies. These measures/supports should be continued and expanded.

To achieve the lifting of import ban of mangoes due to fruit-fly, "establishment of pest free areas", "introduction of vapor heat treatment technology/facility", and "bilateral agreement" are required. However, there are a lot of freely grown mango trees in the major production area; and Burkina's mango production areas are adjacent to the Mali's mango production areas. Thus, "establishment of pest free areas" in the major mango production area is regarded as extremely difficult. An "introduction of vapor heat treatment technology/facility" is regarded as unrealistically ambitious based on the current situation of the government bodies; institutional, personnel and financial limitations.

¹² SUCCESS APPAT (developed by Dow AgroSciences) contains an attractant and an insecticide (Spinosad). It attracts and kills female fruit flies that cause damages to mangoes. It is approved on mangoes by the Sahelian Pesticide Committee (CSP) and authorized in organic production in Europe.

6.1.3 Post-harvest and Processing

(1) Exports of Fresh Mangoes to Europe

1) Harvesting and Collection

Obtaining the Global GAP certificate is essential for exports to European markets. Each exporters create his sourcing network with producers/producers' groups. For example, Fruiteq who exports primarily organic mangoes and fair-trade certified mangoes has a collection system from UPPFL/CO (Union Paysanne des Producteurs de Fruits et Légumes de la Comoé).

There is a specific procedure and method of harvesting and handling for the purpose of ensuring quality/sanitation such as judgment of maturity, picking method, latex removal procedure, method of filling in plastic cases, etc. These specific procedures/methods require the trained manpower and tools; therefore most of producers do not deal with harvest. In fact the exporters arrange and carry out the harvest; for instance, STGF/Durabilis use his harvest crews and Fruiteq use agents (local traders) to collect fruits.

Many fruits are rejected in the packing process. In case of Fruiteq, it buys only export quality mangoes and returns the rejected fruits to the agents, and the agents sells them to regional/national markets.

Mango Harvest for Exports to Europe



Global GAP Certified Orchard



Harvest Tool and Harvest Mangoes with a Long Stem



Latex Removal on Racks

2) Packinghouses

The packinghouses are the core of commodification of export mangoes. There are 3 large-scale packinghouses in Bobo-Dioulasso; owned and operated by SGTF/Durabilis, Fruiteq and Ranch du Koba. These 3 companies are exporter-cum-packers, at the same time provide packing service to other exporters. Durabilis and Fruiteq operate the export mango packinghouse in other countries and they have sufficient management ability. The facility of Ranch du Koba was under full renovation with the financial support of PAFASP since 2013 mango season (renovation started before 2013 season) and it finally has restarted the operation in 2015 season. These 3 units have a total capacity of 18 tons per hour; largely higher than the annual export volume of 3,000 tons.

Table 6.1.12 Mango Packinghouses in Burkina Faso

Owner/Operator	Location	Treatment capacity	Others
SGTF/Durabilis	Bobo-Dioulasso	8 tons/hour	The facility is owned by the government/world bank. Operator is Durabilis NV (Belgium company) who took 70% of the capital of SGTF. Durabilis has a system of supplying mangoes to European markets all year around by sourcing from Burkina Faso, Mali, Peru and other countries.
Ranch du Koba	Bobo-Dioulasso	5 tons/hour (after the renovation)	The owner/operator is a Burkinabe business man. Fully renovated with the support of PAFASP; stopped operation in 2013 and 2014 seasons; restarted in 2015 season.
Fruiteq	Bobo-Dioulasso	5 tons/hour	Fruiteq operates the packinghouse in Mali and Cote d'Ivoire.

* Treatment capacity: Information source is APEMAB (exporters association)

The mango exports by air are shipped from Ouagadougou airport. The quantity of each lot is limited and some exporters do packing at their warehouses, but most exporters do it at above 3 facilities.

As for sea exports, packed mangoes are transported by reefer containers from above 3 facilities to Abidjan port. SDV (subsidiary of Bolllore Africa Logistics which operate the container terminal of Abidjan port) provides the logistic services.

3) Packing Practices and Quality Control

The standard procedure for export mango packing; i.e. staging, maturity and quality control inspection, washing, grading (removal of damaged fruit), sizing, carton filling, and cooling, is practiced.

Packing Works at SGTF/DURABILIS Facility



4) Mango Exporters

The exporters' association called APEMAB (Association Professionnels des Exportateurs de la Mangue du Burkina) was established under the initiative of PAFASP. As of August 2013, 24 companies/organizations are adherent to the association.

There is no complete list of mango exporters and data on export results of each exporter. The introduction of a registration system of mango exporters is planned in accordance with the requirements of EU. Getting the information on exporters must be easier after the introduction of such a system.

The following 7 organizations have "ECOCERT" organic certification for fresh mango (as of August 2013).

Table 6.1.13 Organizations Having ECOCERT Organic Certification for Fresh Mango

Agro Burkina, Association Ton, Burkinature SARL, Coopake (COOPERATIVE AGRICOLE DE KENEDOUGOU), GIE Naffa, SANLE (Groupement Mixte Sanlé Séchage des Fruits et Légumes), Wouol de Beregadougou

Source: List of Ecocert SA certified products and operators in Third Countries according to EU regulation 834/2007 or Ecocert Organic Standard (EOS). As of 30/08/2013

5) Manufacturers of Materials of Packing

SONACEB (Societe Nationale de Cartons et d'Emballages du Burkina) in Bobo-Dioulasso manufactures cartons¹³.

6) Global GAP, Organic Certification Bodies

ECOCERT is an only certification body having a permanent office in Burkina Faso. ECOCERT Burkina Faso provides the certification service of Global GAP, Organic, and ECOCERT Fairtrade. It has 10 inspectors including a JAS organic inspector.

In addition to ECOCERT, TUV NORD INTEGRA (Belgium), ICEA (Italy) and LACON (Germany) provide Global GAP certification service in Burkina Faso, but they have no local offices but have local agents (inspectors). In case of LACON, it has 2 inspectors. INTEGRA was predominant until 2011 but now ECOCERT takes its place.

In case of Organic certification, CERTISYS (Belgium) and ECOCERT are predominant as of 2014. About 90% of the ECOCERT organic certifications are obtained by exporters. A single certification covers the chain from production to exportation.

(2) Exports of fresh mangoes to the Mediterranean and Persian Gulf countries

Exports to the Mediterranean and Persian Gulf countries are still limited at about 300 tons per annum. The majority was exported to UAE (by air) and Morocco (by road) in 2012. Exports to Morocco are conducted by a group of exporters.

(3) Sales of Fresh Mangoes to the Regional Markets and Domestic Markets

As regards the trades with the neighboring countries, Niger and Ghana are the major buyers. Mangoes export to Niger is a traditional trade; mostly Niger traders come to Bobo-Dioulasso to buy mangoes with trucks. In case of Ghana, buyers are mostly manufacturing companies of fresh-cut-fruits and dried mangoes for export. Rejected fruits at packinghouses in Burkina Faso are often shipped to those buyers in Ghana.

¹³ SONACEB is the affiliated business of Rossmann Group in French. Rossmann Group operates the carton manufacturing company in Cote d'Ivoire (SONACO) and in Ghana (SONAPACK).

Niger markets and domestic markets are not quality-conscious. Mangoes for these markets are collected by the local collectors from villages in a similar way of collecting other farm products. Mango fruits are gathered in the fruits and vegetables market in Bobo-Dioulasso (constructed by PAFASP) or at any roadside spaces, and then fruits are wrapped in secondhand carton boxes or bags; or simply loaded on trucks in bulk to transport to destinations. Fruits handling is rough, and secondhand carton boxes are not for damage protection. Production areas are full of mangoes in the season and mango price is very cheap, as a result, people do not care so much about damages on fruits.

The market facility for collection/distribution of mangoes was constructed in Bobo-Dioulasso by PAFASP. Similar facilities are planned to build in Orodara and Banfora by PAFASP. Regarding the packaging material, it is best to use wooden or plastic boxes to reduce the damages occurs in long distance road transportation. However, such boxes are expensive in Burkina Faso; where import timbers and plastic materials.

Collection and Packing of Mangoes for Niger and Domestic Markets (fruits and vegetables market in Bobo-Dioulasso)



The companies in Ghana import fresh mangoes from Burkina Faso for processing purpose. Fruits which are rejected in the packing process are exported to Ghana by some agents (merchants), and it seems they have steady business relation with Ghana buyers. Demands of processing companies in Ghana are steady and positive, therefore, export to Ghana must be increased when Burkina Faso's exportation to Europe is increased.

(4) Production and Export of Dried Mangoes

1) Dried Mango Producers and Exporters

Many small companies (mostly individual business) manufacture dried mangoes mainly for the European markets. Although it is cottage industry using the locally fabricated gas dryers called ATESTA, introductory stage has passed and mango drying is an established industry now.

According to the report showing the situation in 2008/2009¹⁴, there existed about 60 manufacturers¹⁵ of which annual production capacity are from 1 to 35 tons (finished product base); about half of them were 6 to 10 tons capacity. Estimated total number of dryers was 400 units and having total production capacity at about 640 tons per annum. However, the current situation is unclear.

It is said that there are many exporters who handle dried mangoes. It has confirmed that among the 24 exporters/organizations involve in the APEMAB (Mango exporters association), 8 of them are engaged in dried mango exports. In general, there are two types of dried mango exporters; i.e. independent type and group type. The group type is a sort of collective marketing by manufacturers. The group types often receive the assistances of NGOs.

¹⁴ Affaire juteuse ou déception amère : quel est l'avenir des produits dérivés de la mangue au Burkina Faso et au Mali ? (2011), Institut Royal des Tropiques (KIT)

¹⁵ Most of information on dried mango sector says that there are "about 60" business units in the country". It is assumed that "about 60" was the number of registered units at the time of establishment of PTRAMAB in 2008.

Table 6.1.14 Types of Dried Mango Exporters

Independent type: Buy from manufacturers and/or self-manufacture	Gebana Afrique SARL, Burkinature SARL, SANLE Export, etc.
Group type: Manufacturers collaborate or form a GIE*	GIE Naffa, Wouol, etc.

*GIE: Groupement d'intérêt économique

The following 7 organizations have “ECOCERT” organic certification for dried mango (as of August 2013).

Table 6.1.15 Organizations Having ECOCERT Organic Certification for Dried Mango

Association Ton, Burkinature SARL, Coopake (COOPERATIVE AGRICOLE DE KENEDOUGOU), GIE Naffa, SANLE (Groupement Mixte Sanlé Séchage des Fruits et Légumes), Wouol de beregadougou, Gebana Afrique SARL
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Source: List of Ecocert SA certified products and operators in Third Countries according to EU regulation 834/2007 or Ecocert Organic Standard (EOS), As of 30/08/2013

Many of manufacturers who tackled dried mango production in the introductory period received the NGO’s supports. Currently it is easier to enter this business since the exporters; i.e. domestic buyers already exist. As for the initial investments, the World Bank program - PAFASP provided the financial support for installation of driers and renovation of facilities to some manufacturers.

2) Mango Varieties for Dry Processing and Raw Material Procurement

3 varieties (Amélie, Lippens and Brooks) are used for dry processing. These varieties have different harvest times, therefore, drying operation last for about 4-5 months from April until July/August. Kent variety is not used for drying since it is main variety for fresh exports and prices are high. The late variety Brooks receive a lot of damages caused by fruit-flies. About 30 to 50% of collected Brooks fruits are not usable for dry processing.

The dried mango producers individually form his sourcing network with producers/producers’ groups to secure the raw material supply.

3) Products and Processing Method

The dried mango production in Burkina Faso was initiated by NGO’s support to export to the Swiss markets. Since then, dried mangoes without added sugar have been kept producing to cater to demand of “natural” products in the European markets. The demand of “natural” dried mangoes in Europe is firm and increasing. Since the demand of “natural” products is firm, sugar price is not low and new technology is required, there are no manufacturers who intend to try to produce “sweetened” dried mangoes.

The manufacturing process is; selection → ripening → washing → peeling → cutting → drying → adjusting size/shape → packaging. Plastic bags (various sizes according to customer’s requirement) and heat-sealing is used for packaging. This process is same to all the manufacturers. However, facility layout, work efficiency, level of hygiene/quality control and usage of waste/by-product are different from one unit to another.

With regard to the processing yield rate, it differs according to the variety. For example, to produce 1 kg of products, Amélie variety needs 15kg of fruits whereas Brooks variety needs 22kg.

Dried Mango Processing Facility and Manufacturing Process



Selection

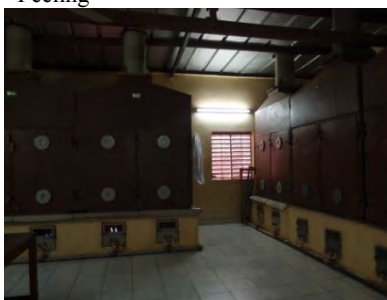
Ripening



Washing place

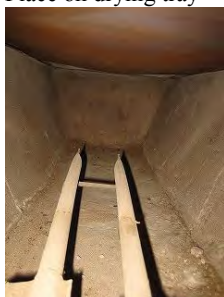
Peeling

Cutting



Place on drying tray

ATESTA dryer



Gas burner

Detach products from sheets

Adjust size/shape



Packaging

Wasted pulps around seeds

i) Dryer Used in Burkina Faso

Except for the 4 units of South African dryers introduced with the financial support of PAFASP in 2012 and some testing dryers introduced by the foreign-affiliated export company, all other dryers used in Burkina Faso are so-called ATESTA dryers. ATESTA dryer is a type of gas dryer

with no electric fan (i.e. natural convection only), wooden chamber and wooden drying trays. It was introduced in 1995 by the CEAS (Centre Ecologique Albert SCHWEITZER, Swiss NGO).

ATESTA dryer is fabricated by local craftsmen trained by the CEAS at current price from 1 to 1.2 million FCFA per unit. It does not use electricity and fabricated locally at a moderate price, therefore it is the dryer adapted for the circumstances in Burkina Faso. However, ATESTA dryer has some defects such as; the temperature inside of chamber is uneven distributed and need to change the positions of each drying trays (up and down and front and rear) periodically, no way to adjust airflow, difficult to do precise temperature control/setting, and poor quality gas burners (long flame) can put wooden trays on fire. Since drying trays are wooden made, it requires more caution about hygiene control.

In spite of 18 years passed since the introduction of ATESTA dryer, almost no improvements has been made on it; by users/craftsmen neither by the government research organization. The CEAS says that they have been trying to develop an improved-type. However a prototype development (which was planned to complete at the end 2013) has not yet achieved. The CEAS does not disclose information about the proto-type specifications; therefore, it is unknown what kinds of improvements the CEAS intends.

The joint venture between Burkinabe dried mango producers and South African company started with the support of PAFASP in 2012. Thus, 4 units of South African dryer were introduced and started operation in 2013 season. This new type dryers are; horizontal forced airflow, gas burner + electric fan, plastic trays + wheeled platform, automatic temperature control function, and with processing capacity of 240 – 260 kg/batch (products base, equal capacity to 12-13 ATESTA dryers). All dried mangoes produced by these 4 dryers are bought by the South African company.

South African Dryers Introduced with the Support of PAFASP



ii) Hygiene Control in the Drying Facility

Many of the drying facilities are built by modifying an ordinary house. Such facilities have problems as food processing facility; such as bad layout, lack of water supply and drainage system. In regard to the preventive measures for contamination risks in the operation, many facilities need to be improved. For example, none of the facilities wash workers bare foot before entering the facility, although workers come to work with sandal and work with dirty bare foot in the facility. The drying facility obtained HACCP certification is only one (1) as of 2014 among 50-60 drying facilities in Burkina Faso.

iii) Utilization of the Waste

Fruit pulps around seeds, peel and seeds are not utilized in most of the facilities. In the 2014 season, only a company operated large-scale drying facility (equip with South African dryers and processing machines) produced mango rolls from pulp around seeds. Some facilities which have extra space in their premises pile up the waste (peel, seeds, pulps) in vacant ground, and use it as compost.

(5) Production and Marketing of Juice and Mashed Potatoes

There is a modern industrial-level juice/puree factory of DAFANI S.A. in Orodara. This factory was installed in 2007 and it has the production capacity of 3 to 5 tons/hour of puree, and 25,500 liters/hour of juice (nectar). In 2008, 400 tons of puree was produced, but due to non-uniform quality and use of Amélie variety which is unfamiliar to the user and has a different quality with Indian Alphonso variety, the attempt to export to Europe was not materialized. 4.5 millions of retail pack juice were produced and marketed to the domestic market and to Cote d'Ivoire, Mali and Ghana in 2008¹⁶. In 2009, REFRESCO/Delifrui (French company) carried out the production test with DAFANI's puree (the result of the test is unknown).

In 2010, DAFANI S.A. had to stop the production due to financial problems. In 2011, the government intervened by injecting the capital through the PAFASP and Programme de restructuration et de mise à niveau des entreprises en difficulté. Thus, the private sector (Ecobank, etc.) held 58% of the capital and the government held 42%. DAFANI S.A. went back to operation in April 2011¹⁷.

Recent production and sales data of DAFANI S.A. are not obtained. DAFANI's Web page shows the following information (August 2013).

- a) 3 types of aseptic puree (conventional, organic, equitable) are produced at scale of 2.5 tons per hour.

Puree Production Facilities



Source: Web page of DAFANI S.A.

¹⁶ L'AMELIORATION DES PERFORMANCES DE LA FILIERE DES PRODUITS TRANSFORMES DE LA MANGUE AU BURKINA FASO ET AU MALI (Février 2009), KIT/WB/OCDA/PAFASP/EU

¹⁷ MICA, Newspaper article (<http://www.commerce.gov.bf/index.php/quotidien/39-agenda/82-unite-industrielle-ldafani-r>, Le MICA au contact du fer de lance de la filière fruitière «DAFANI» au Burkina Faso, 11 FÉVRIER 2013)

- b) 4 types of nectar juice (mango, orange, mixture of orange-mango, mixture of mango-pineapple -Passion fruits) are produced at scale of 3,000 liters per hour.

Nectar Juice Production Facility and Products



Source: Web page of DAFANI S.A.

- c) Raw materials are sourced from 400 contractual producers in 4 provinces (Kéné Dougou, Léraba, Houet and Comoé). Total supply capacity is 50 tons per day.

6.1.4 Value Chain

(1) Trade Chain

The trade chains of fresh and dried mangoes are shown in the following diagram.

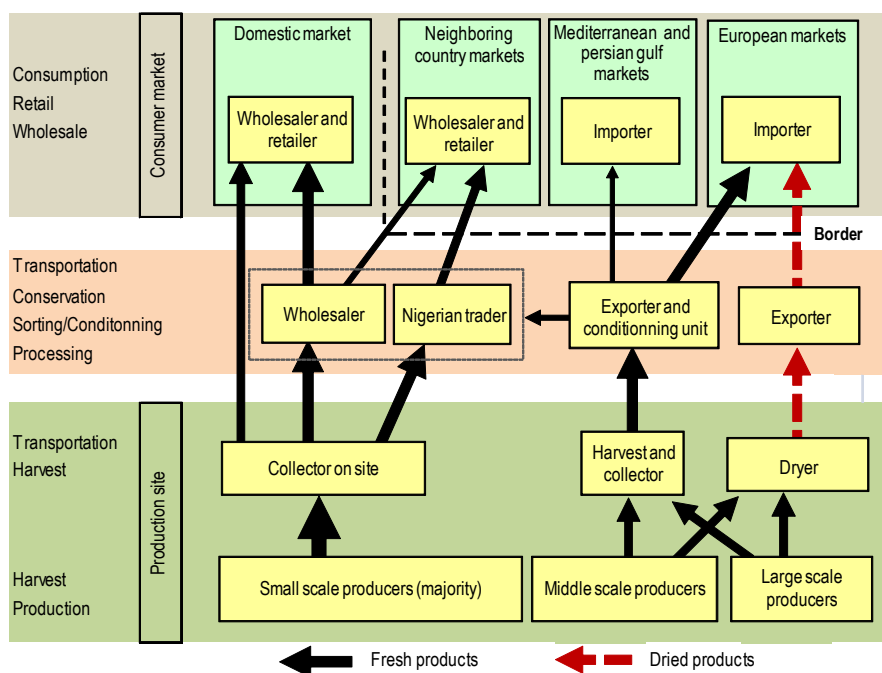


Fig. 6.1.5 Trade Chains of Fresh and Dried Mangoes

The activities and roles of the major actors are mentioned in the preceding sections of “6.1.2 Cultivation/Production” and “6.1.3 Post-harvest and Processing”. The value chain varies according to the products (fresh or dried) and the end markets. The characteristics of each chain are summarized as follows.

- For fresh mango exports to Europe, value chain is vertically integrated by the initiative of exporters in order to attain the Global GAP certification and to carry out adequate quality control. The groups of small-scale mango producers are organized. The fact that the producers do not carry out harvest is a unique feature.
- For fresh mango sales to domestic markets and Niger markets, high quality is not demanded.

Marketing activities are carried out by local collectors and traders in a similar fashion with other farm products. Steady relations between traders and producers are not observed. In most cases of exports to Niger, Niger traders come to Bobo-Dioulasso to buy mangoes with trucks.

- c) For dried mango exports to Europe, about 90% of organic certifications are obtained by exporters. Thus, same as the case of fresh export, value chain is vertically integrated by the initiative of exporters. Exporters provide financial support to buy material mangoes and packaging materials to dried processors. Dried processors and mango producers are often bound by contracts in order to ensure the stable supply of raw materials. Coordinated exportation by small-scale dried processors is done by forming GIE company.

(2) Production Costs of Dried Mangoes

The buying prices of material mango fruits vary according to the variety, location and month. However, they are mostly 35-65 FCFA/kg except for the fair-trade case. The late variety Brooks which receive many damages of fruit flies is less expensive than Amélie and Lippens varieties. The dried processor of case 1 sets maximum buying price at 50 FCFA/kg. In general, the production cost per kg of product is 2,500-3,500 FCFA/kg, and the selling price is 3,000-5,000 FCFA/kg. Although the production costs and selling prices are case by case, 500 FCFA is a common target profit per 1 kg of products for dried processors.

Table 6.1.16 Production Costs of Dried Mangoes (costs per 1kg of products)

Items	Case 1		Case 2	
	FCFA	%	FCFA	%
Production costs per 1kg of export quality product	2,383	100%	3,935	100%
Mango fruits	1,000	42.0%	1,294	32.9%
Gas	525	22.0%	453	11.5%
Manpower	340	14.3%	691	17.6%
Water	80	3.4%	147	3.7%
Electricity	60	2.5%		
Consumables	10	0.4%		
Facility maintenances	47	2.0%		
Packaging materials	148	6.2%	Provided by customer	0%
Organic / Fairtrade certification	300	12.6%	1,200	30.5%
Management /office expenses	-	-	150	3.8%
Sales value of second quality products	Δ128	Δ5.4%	-	-
Selling price of 1kg of export quality product	3,100		4,400	
Gross profit on 1kg of export quality product	717		465	

* Case 2 is a case of Fairtrade product

Source: JICA team

Following countermeasures are derived from the above cases.

- a) The cost of gas account for 10-20% of the total costs. The gas price is subsidized by the government, and Burkina's dried mangoes are competitive over Mali's products. The case 1 got gas with 5,250 FCFA/can. If the subsidy is abolished, gas price must become 9,000 FCFA, and the gross profit should fall with half (343 FCFA/kg). Thus, continuation of subsidy is desirable.
- b) The expenses for the organic/fair-trade certification account for 12% of the total costs in the case 1 and 30% in the case 2. It is then proposed to seek a high-end market of developed nations where put no great value on organic certification; such as Japan market.
- c) The processing yield rates differ according to the mango varieties. Amélie variety has a higher yield rate, less possibility of fruit-flies damages and the products have a characteristic sourish

taste. It is then proposed to expand the production and exportation of Amélie products to the markets (countries) where people prefer sour taste.

(3) Value Chain of Fresh Exports to Europe

The following table shows an example of the value chain for European supermarkets.

Table 6.1.17 Example of the Value Chain of Fresh Exports to Europe

	Selling price (USD/kg)	Added value (USD/kg)	Rate of the added value in the selling price
Supermarkets in Europe	3.50 - 6.00	0.38 - 2.88	11 - 48%
European importer	3.12	1.81 - 2.31	39 - 52%
Burkinabe exporter	0.81 - 1.31	0.46 - 0.89	13 - 15%
Producers organization	0.35 - 0.42	0.16 - 0.23	3.8 - 4.6%
Producers	0.19		3.2 - 5.4%

Source: Calculated from the data on Rapid Impact Evaluation, Fruiteq - Burkina Faso, Root Capital, March 2013

6.1.5 Formulation of Organizations in the Value Chain

The organizations structured at the national level specific to mango are as follows. These organizations were established all under the initiative of PAFASP and each organization are still loosely knit groups. There are merchants/manufacturers/companies participating merely in expectation of PAFASP's supports, and the members do not have a common interest. In addition, these organizations have no financial resources; therefore few activities are performed independently.

- Producers' organization : Union Nationale des Producteurs de Mangués du Burkina (UNPMB)
- Processors' organization : Professionnels de la Transformation de la Mangué au Burkina (PTRAMAB)
- Exporters' organization : Association Professionnels des Exportateurs de la Mangué du Burkina (APEMAB)
- Inter-profession : Association Professionnelle Mangué du Burkina (APROMAB)

APROMAB is composed by UNPMB, PTRAMAB and APEMAB.

6.1.6 Support Projects by Other Donors

(1) World Bank: PAFASP

PAFASP has been implemented for about 6 years from December 2006 with a loan of the World Bank. The target products are mainly mango, onion, meat and poultry. The objectives are improving competitiveness of products for domestic, sub-regional and international markets and contributing to growth of the VCs. Activities implemented in the mango sector in the 1st phase (ended in March 2014) are summarized as below.

As for countermeasures against fruit-flies, technical capacity building of concerned parties and technicians and fruit-fly management were implemented¹⁸. Regarding the capacity building, 1) Preparing and disseminating the educational material on fruit fly recognition, its biological cycle, damages caused and practical advice for fly management; 2) Information campaigns and trainings in the main production areas; 3) Monitoring of fruit-fly population by installing traps, and organize guided inspectors; 4) Training of 20 trainers and industry players such as exporters; 5) Training and formation of a 25-technicians team for orchard treatment; 6) Draw up a self-inspection guide for Sanitary and Phytosanitary (SPS) systems to ensure consumer health and safety (with the technical support of COLEACP) were implemented. Regarding the fruit-fly management, two methods were

¹⁸ Fighting Fruit Flies Regionally in Sub-Saharan Africa, Information Letter 2010, N°5, May 2010, COLEACEP/CIRAD

introduced; 1) Orchards maintenance operation: Ploughing + pruning + cleaning to reduce the infestation rate by destroying larvae and pupae on the ground; 2) SUCCESS APPAT (GF-120 fruit Fly BAIT). Introduction of SUCCESS APPAT was conducted as a pilot project for area of 1,000 ha started in March 2010. PAFASP provided a partial grant (90% of the product cost) to producers' organizations. A treatment support, advice and monitoring system was set up under the supervision of the Plant Protection Authority (DGPV), in partnership with INERA. National Action Plan for control of mango pest and disease¹⁹ was prepared in the end of 2013. It is likely that the implementation will be financed by PAFASP (phase II) and another World Bank program by West Africa Agricultural Productivity Program (WAAPP).

In regard to dried mango sub-sector, 1) Provided a partial grant (65% or 80%) for installation of ATESTA driers [price of ATESTA drier = 1.0-1.2 million FCFA per unit]; 2) Provided a partial grant (80%) for installation of 4 units of South African driers [price of South African drier = 25 million FCFA per unit]; 3) Supported the creation of the joint venture with the South African dried fruits manufacturer; 4) Supported the companies to obtain GLOBAL GAP certification were implemented. For the fresh mango exporters, 1) Renovation of packinghouses: SGTF/Durabilis and Ranch du Koba; 2) Supported the companies to obtain GLOBAL GAP certification were implemented. For the juice processing company DAFANI S.A., PAFASP engaged in the capital injection in 2011 but the detailed information is not obtained.

In regard to the promotion of regional/domestic marketing of fresh mango, fruits and vegetable market facilities were constructed in Bobo-Dioulasso, Orodara and Banfora; which play a role of collection/relay of mangoes.

(2) World Bank: West Africa Agricultural Productivity Program (WAAPP)

The WAAPP is a World Bank program intended to support the 15 ECOWAS member countries with the objective to transform the region's agriculture through the development, dissemination and use of improved agricultural technologies. The program period is from 2011 until 2016. It is composed of 4 components of which the 3rd one "Funding of Demand-driven Technology Generation and Adoption" aims at accelerating the adaptation of readily available technologies as well as generation and dissemination of adapted technologies. In the sub-component 3-2 "Support to accelerate adaptation of released technologies", readily available technologies to be promoted are indicated for each target crop and for each country. In case of Burkina Faso, fruit-fly management technology is one of them.

Sub-component 3-2 consists of supporting on (i) stakeholder workshops for the preparation of national dissemination action plans for released technologies; (ii) promotion of released technologies through various media to improve awareness of technologies and scale up their use; (iii) introduction of information technology in the technology transfer system; (iv) participatory training on released technologies for extension service providers, including national extension services, NGOs, input providers, farmers' organizations, and other stakeholders; and (v) field demonstrations of released technologies. Some parts of the National Action Plan for control of mango pest and disease (planned by PASAFP) are planned to be implemented by WAAPP funds.

(3) CIR: Projet d'appui a la commercialization de mangue sechee et de noix de cajou transformee (CIR-SNV PROJECT²⁰)

This project is implemented with the CIR funds. CIR is a worldwide partnership of donors and international organizations include Japan for help in Trade for Less Advanced Countries.

DGCE of Ministry of Commerce formulated the National Export Promotion Strategy (Strategie Nationale des Exportations/SNE) in year 2010 which presents the development directions and objectives of selected export commodities; include mango. This project follows the SNE and is

¹⁹ "Plan d'action national de lutte contre les nuisibles du manguier" in French

²⁰ Abbreviated name of the Project has not yet officially determined. CIR-SNV PROJECT is used in this report.

implementing under the institutional control of MICA.

Implementing bodies are the National Implementation Unit of CIR (UNMO/CIR) and Dutch Development Organization (SNV). Project period will be 3 years from July 2014. Total budget is 1.58 billion FCFA; of which 1.35 billion FCFA (85%) to be covered by CIR funds and 234 million FCFA (15%) by Burkina Faso government. Target products are dried mango and cashew nut (processed). Budget will be evenly used for these two products (sectors).

Expected impacts are; 1) 20% increase of dried mango and processed cashew nut export earnings, 2) 10% increase of actors' incomes, and 3) 150 jobs creation in the processing units. The project consists of 4 components and total 11 activities.

Component 1: Organizational and technical capacity building of actors

1. Support to the organizations to link processing and commercialization.
2. Training of organizations members.
3. Support and advice to actors.

Component 2: Improvement of technical and technological capacities of processing units

4. Training, support and advice to processors.
5. Support to the improvement of product quality.
6. Support to the development and dissemination of appropriate technologies.
7. Support to the renovation of processing units in difficulty.

Component 3: Increase of export volume and improvement of product quality

8. Training of exporters.
9. Promotion of products in local, regional and international market.

Component 4: Improvement of access to the financial services by actors

10. Training on fund raising.
11. Formulation of business plans of processing units.

Training of actors is a major activity. In regard to the introduction and dissemination of technology, biogas, hygiene control, product quality improvement and renovation of 10 processing units are planned. However, details of activities (contents, inputs) and results of outputs are unexplained. There is the budget to procure small equipment and tools (to be covered by the government) and UNMO/CIR requested PTRAMAB to submit a proposal in January 2015. PTRAMAB filed for the Japan-made equipment for Atesta dryer modification which was used in the pilot project.

6.1.7 Activities of the Government Organizations

(1) DPVC

DPVC (Direction de la Protection des Végétaux et du Conditionnement) is the government organization responsible for sanitary and phytosanitary inspection. There are 18 posts in the country where phytosanitary inspection is conducted. Fresh mangoes for EU exports are inspected at the center in Bobo-Dioulasso.

To identify the new target countries for fresh mango export, information about phytosanitary regulation/measure of other countries against Burkinabe mango is essential. Phytosanitary regulation/measure of other countries needs to be collected by/through the national plant protection organization of the country. In Burkina Faso, DPVC is responsible for this task. However, the DPVC does not actively collect the information due to limited number of staff (only 3 persons) in SCPQ (Service du Contrôle Phytosanitaire et de la Qualité) which oversee the 18 posts. In addition, English proficiency of SCPQ staff is not sufficient for the information work.

(2) Organizations Engaged in Export Promotion of Agricultural Products

As previously described in Chapter 2.5.2 Export Structures and Institutions, roles of government

organizations being set by laws are overlapped; e.g. export promotion of agricultural products is duty for APEX and DGPER of MARHASA, supporting participation in overseas trade shows is duty for APEX, CCI and MEBF. As a practical measure, these organizations somehow demarcate roles; for example, DGPER works on export promotion to neighboring countries, CCI works on sales promotion in international market, and MEBF work on support of domestic businesses.

Regarding the supports for mango processing business, industrial-scale juice processing business of DAFANI S.A. is under the supervision of MICA. For the small-scale dried processing business, both of MIT (CIR-SNV PROJECT) and MARHASA (PAFASP) has been implementing the supportive project, and the demarcation between MIT and MARHASA is unexplained.

6.2 Promotion Issues and Measures

Based on the present situation mentioned above, issues and measures for maintaining and promoting exports are analyzed and sorted out.

6.2.1 Promotion Issues and Measures on Fresh Mango Exports

(1) Promotion Issues

1) Expansion of Sales Outlet

The importation of mangoes by Europe, Russia, Mediterranean and Persian Gulf countries increased 1.3 times during the period between 2007 and 2011. This upward trend is expected to continue. In terms of volume, EU-27 and Persian Gulf countries are expected to increase the imports.

The annual volumes of mango exports from Burkina Faso to the EU-27 were 2,000 to 3,300 tons during 2007 - 2011. On the other hand, the export volumes to the Mediterranean countries and the Persian Gulf countries remains at low level; approximately 300 tons a year and the majority were exported to UAE and Morocco in 2012.

In case of export to the EU-27, a whole container is rejected if a fruit-fly is found by phytosanitary inspection at arrival ports. Therefore, mango exports to the EU from Burkina Faso come to end in the middle/late June (after steady rain) due to high risk of total losses by a detection of fruit-fly infestation.

Considering these situations, the expansion of mango exports shall target the markets of non-EU Europe, Mediterranean and Persian Gulf countries where current exports are still limited and a country do not reject a whole container may exist. Needless to say, efforts to maintain and expand the exports to the EU shall be continued in parallel.

i) Collection of Phytosanitary Information against Burkina Faso Mangoes

To explore the possibility of export to new country, wide variety of information are necessary such as import formalities/regulations, demand/supply situation and consumer' preference, exports by competing countries, phytosanitary regulation/measure, pesticide regulation, buyer information, logistics costs and so on.

The phytosanitary regulation/measure against Burkina Faso mangoes determines a great part of export possibility and it should be collected in the first place. There are countries post the phytosanitary regulation on website but information is often not up-to-date. The latest phytosanitary information of other countries should be collected from the national plant protection organization of other countries by DPVC according to International Plant Protection Convention. However, the DPVC does not actively collect the information due to limited number of staff (only 3 persons) in SCPQ (Service du Contrôle Phytosanitaire et de la Qualité). In addition, English proficiency of SCPQ staff is not sufficient for the information work. DPVC

shall start the collection of phytosanitary information in order to meet the needs of the exports.

Other information for export marketing is to be gathered by the exporters by themselves in general. However, the assistance of APEX, MICA, ICC and diplomatic missions abroad shall be given to the exporters.

ii) Acceleration of Sales Promotion by Exporters

The participation in trade fair held in a target country/region is effective means for expanding sales outlet. However, it requires a significant amount of money²¹. Burkinabe mango exporters are small-scale company and their financial capacity is limited.

The financial support for the exporters is very effective to accelerate their challenge to expand sales and to find new outlets. Concretely, costs for taking part in overseas trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting foreign buyers, and conducting foreign market survey shall be subsidized.

iii) Acceleration of Export Promotion by APEMAB

It is popular in many countries that a producers/exporters association of agriculture product carries out the export marketing and promotion. APEMAB (mango exporters association) was established under the initiative of PAFASP. However, APEMAB has no fund to conduct activity independently and heavily relies on donor support. APEMAB shall challenge to the creation of own funding source.

2) Enhancement of Production of Exportable Mangoes

i) Increase of Production Area

Production of mangoes suitable for fresh exports should be increased along with the expansion of outlet. Reliable method for increasing the production is to increase the production area. In Burkina Faso, mangoes are produced by many peasants; not by large-scale farms managed by companies. There are under mentioned issues to increase the production area.

a. To increase the numbers of intermediate-scale producers:

Currently intermediate-scale producers are the main suppliers of mangoes for exports. To increase the numbers of intermediate-scale producers, organizing the producers into groups and training them on orchard management for export mangoes production are indispensable. Introduction of Global GAP is necessary for EU exports.

b. To bring in small-scale producers in the export value chain:

Small-scale producers account for great majority of mango producers, but they produce local varieties and non-grafted mangoes and almost no particular care of trees/orchard is practiced.

To bring in small-scale producers in the export value chain, it is necessary to change local varieties to exportable varieties by replacing trees and/or by grafting. Same as the above case, organizing the producers into groups, training them on orchard management and introduction of Global GAP are necessary. The number of producers to deal with will be more than the case of dealing with intermediate-scale producers. Hence it requires more cost and more efforts to organize and train the producers. Global GAP requires an installation of toilet in mango orchard and it blocks to attain the certification if rule is rigorously applied. If the change of varieties by

²¹ In case of Foodex Japan, it costs about 1 million JPY for renting and decorating a booth, air fare and per diem for one person from Burkina Faso.

grafting is feasible, required years to increase the production is shorter than that of by replacing.

c. To establish the large-scale farms managed by company:

A large-scale mango farm is few in Burkina Faso. This method of production does not require organizing the producers into groups and training the producers. Also, Introduction of Global GAP is easy. However, benefit of exports will not reach to the producers (farmers) although it may create jobs for the people around a farm.

It must be possible to avoid the fruit-fly damages by growing mango trees in very dry area with irrigation. Feasibility to establish such farm in the country in terms of water resources, initial investments, marketing (logistics) and etc. is unknown. The success of establishing a large-scale mango farm in non-polluted area has a high possibility to lead the “establishment of pest free areas”; one of the conditions for lifting of import ban of Burkina Faso mangoes due to fruit-fly.

3) Enhancement of Conditioning Capacity

i) Enhancement of Conditioning Capacity for Air Mangoes

The three mango packinghouses have total capacity of 18 tons per hour and it must be sufficient in the immediate future. Many of air mangoes are packed in these 3 large-scale packinghouses now. However, in the course of commencing the business with new customers, agile conditioning (packing) of small-size lots for air shipment is important. Thus, introduction/improvement of small-scale packing facility and cool storage by the exporters shall be promoted.

(2) Promotion Measures

1) Expansion of Sales Outlet: Identification of Target Countries

i) Strengthening of Information-gathering Capacity of DPVC

To clarify new target countries in the Mediterranean and Persian Gulf countries, phytosanitary regulation/measure against Burkina Faso mangoes should be collected in the first place. DPVC is the official body to inquire the phytosanitary information to the national plant protection organization in other countries. However, the DPVC has no sufficient capacity to operate the information-gathering due to limited number of staff (only 3 persons) in SCPQ and limited English proficiency of the SCPQ staff.

Therefore, strengthen the information-gathering capacity of DPVC by deploying a new staff that has an adequate English proficiency (desired Arabic, too) and by allocating necessary budget for operation of information-gathering activity.

ii) Strengthening of APEMAB’s activity to Gather Export Marketing Information in order to Determine the Target Countries

APEMAB’s information-gathering activity is to be supported financially to accelerate the determination of target countries for fresh exports. Other option for the determination is to support the individual exporters to carry out information-gathering and determine his target. In view of the proposed measure for sales promotion shown in below and in order to consolidate members’ relationship, it is proposed to support to APEMAB.

APEMAB gathers information for export marketing such as import formalities/regulations, demand/supply situation and consumer’ preference, exports by competing countries, buyer information, logistics cost and so on. Together with the phytosanitary information obtained by DPVC, APEMAB determines the target countries based on the opinions of member exporters.

2) Expansion of Sales Outlet: Acceleration of Promotion Activity

i) Acceleration of Sales Promotion by Exporters

Financial support for the exporters who work on finding buyers and expanding sales in the determined target countries is to be provided. Concretely, subsidize the costs for take part in trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting buyers and market survey.

ii) Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

In order to create the funding source for association activities, a collection (imposition) system of contributions on mango exports is to be established in/by APEMAB, and the supports to APEMAB is to be provided. The introduction of registration system of mango exporters is planned in response to the EU's request. After its introduction, it must be much easier to establish a system of contributions on exports.

3) Enhancement of Production of Exportable Mangoes

i) Increase of Production Area by Small-medium Producers

Organizing the producers into groups and training them on orchard management for export mangoes production are indispensable for export mangoes production. Introduction of Global GAP is also necessary to export to the European markets. The exporters are the ones who accomplish these tasks to secure their sources of exportable mangoes, and they already have the know-how for doing it. Financial support for the exporters who work with new small-medium producers is to be provided.

It is exporters to decide whether to increase their sources of exportable mangoes by new planting or by grafting.

ii) Increase of Production Area by Establishing Large-scale Farms

Financial support to reduce the burden of initial investment is to be provided for individuals/corporate bodies for promoting the establishment of large-scale farms.

Financial support such as tax concession in land acquisition/possession, loan with low interest and so on are assumed. As mentioned previously, benefit of exports will not reach to the producers (farmers) although it may create jobs for the people around a farm.

iii) Irrigated Mango Production in Non-polluted Area by Fruit-fly

Financial support for individuals/corporate bodies is to be provided to promote a mango production in very dry area (non-polluted area by fruit fly) with irrigation. Financial support such as such as tax concession in land acquisition/possession, loan with low interest and so on are assumed.

4) Enhancement of Conditioning Capacity

i) Installation of Small-scale Conditioning Facility for Air Mangoes

Fresh exports to new countries/buyers will start at small deal; often for niche market. Thus, conditioning (packing) of small-lots of air mangoes is important. To promote the installation and renovation of small-scale packing facility and cool storage, financial support for exporters such as loan with low interest or subsidy is to be provided.

6.2.2 Promotion Issues and Measures on Dried Mango Exports

(1) Promotion Issues

1) Improvement of Hygiene: Fulfilling the EU Regulation on the Hygiene of Foodstuffs

Burkina Faso's dried mangoes are produced and exported to Europe as organic certified products and fair-trade product. They have steady/firm buyers and the demands of the European markets appear steady. According to the two major Burkinabe exporters, they had problems of contamination by dead insects and pesticide residues but never had very serious problems of food safety/hygiene.

However, there are many drying facilities which were built by modifying an ordinary house. Such facilities have problems as food processing facility; such as bad layout, lack of water supply and drainage system. Almost none of the processing facility practices the hygiene control/food safety management based on the HACCP principles. As of 2014, among 50-60 drying facilities in Burkina Faso, only one facility is working on to obtain the HACCP certification.

The food safety requirements/regulations on imported foods in the developed nations will become increasingly severe as seen in the Food Safety Modernization Act (FSMA) in USA. It is necessary to improve the hygiene/food safety in the dried mango processing facilities not to lose the current customers and to expand sales in the developed nations. Currently the majority of dried mangoes are exported to Europe. Therefore, urgent issue is to fulfill the "Regulation (EC) No.852/2004 on the hygiene of foodstuffs".

The dried mango production in Burkina was initiated by NGO's support in 1995 and exportation of organic dried mangoes to Europe has long been practiced. Among the 37 drying units which applied to the pilot activity, more than half of the units have 10 years' experience of exporting organic dried mangoes to Europe and most of them have more than 5 years' experience. On the other hand, many of the units are seen as not meeting the EU hygiene regulation, it is wonder how the exports to EU is continuing. The reasons for many facilities remain in low level of hygiene condition are assumed as follows.

i) Lack of Knowledge of Processors, Low Requirements for Improvement from Exporters and Food Hygiene Administrative Body

First of all, dried mango processors do not have adequate knowledge/information about the requirements of EU hygiene regulation (requirements of buyers of developed nations). It is assumed that underlying reasons are low requirements for improvements are given by exporters and local administrative body for food hygiene. Processors (owner of business) must have idea that "My facility is same with others. Improvements need money and I have no idea how to do it. There was no serious problem in the past".

ii) Processing Facilities Being Built by Modifying an Ordinary House

Many processing facilities use an ordinary house with a little bit of modification. Such facilities lack the appropriate layout, design, construction and size as food processing facility. In short, they are bad layout, narrow and non-washable.

iii) Facility Renovation must be Planned and Carried out by Processors

Renovation of processing facility in Burkina Faso has to be planned and carried out by facility owner. A facility owner himself hires local workers such as carpenter, plasterer, tiler, plumber and metal worker and buys construction materials. Unfortunately, skill level of these local workers is not high and they only can do what they did before.

Therefore, facility owners are required to have the practical ability to plan and carry out the renovation; i.e. ability to plan/image the finished state, knowledge/experiences in carpenter/tiling/plaster/plumbing works and ability to instruct/supervise local workers. However, facility owners (processors) are not always capable to do these. In addition, there is no place/person to consult about renovation of food processing facility.

iv) Materials and Equipment are often not Available in the Market. (Related Industries are Undeveloped)

Available materials/tools/services to use the facility renovation/hygiene improvement were searched in the pilot activity. As a result, many items were not available (not found) in Burkina Faso; such as stainless steel top work table, stainless and aluminum materials (round bar, flat sheet, angle), metal processor capable to work on stainless steel and aluminum, food grade floor finish paint, thick and transparent plastic sheet for hanging curtain, water-resistant plywood, disposal rubber glove, and disinfectant for human hands/institutional use. Compared to other African nations, many items are not available in Burkina Faso.

v) Unimproved ATESTA Dryers are Kept on Using.

Although 18 years has passed since the introduction of ATESTA dryer in Burkina Faso, almost no improvements has been made on it; by users/craftsmen neither by the government research organization. The hygiene/food safety problem of ATESTA dryer is wooden trays. Mango fluid stick to wooden frame by heat and it is hard to remove even by washing. There are chances of small wood pieces and nails coming out from wood frame and mixing in the products.

Making of a frame with stainless-steel bar and fixing heat-resistant plastic net on it, as used in some South African dyers, is impossible now in Burkina Faso. No one has attempted to make such stainless-steel frame trays in Ghana or in Cote d'Ivoire. No one has ever attempted to import plastic trays from the developed nations.

vi) Financial Limitation of the Processors

Business scales of dried mango processors are in a range from 2 units to 25 units of ATESTA dryers. Among the 37 processors who applied the pilot activity, 21 processors have less than 10 units of dryers. Some of the larger scale processors have access to bank finance. However, majority of processors have no/limited access to formal financial service.

2) Improvement of Product Quality

Since the quality of material mangoes are very good. Taste of Burkinabe dried mangoes is superior to the sugar-added products of Thailand and Philippines; sweet without sugar-added and rich in mango flavor. However, way of controlling drying temperature should be improved to improve the product quality and quality stability.

i) Unsuitable Control of Drying Temperature

Many of ATESTA dryers have no thermometer or thermometers are non-functioning. Therefore processors judge drying temperature by seeing the size of gas flame. They tend to dry faster and make gas flame larger. As a result, surface of products become hard and mango flavor is lost. Some believe that they can control temperature precisely by seeing the size of flame since no complaint about quality from his buyer. Unfortunately, suitable thermometer to measure inside of drying chamber is not available in Burkina Faso and the processors cannot import it by themselves.

ii) Improvement of ATESTA Dryer

To be described in the next section of 3) Improvement of profitability

iii) Introduction of Antioxidant for Product Storage

Since the Burkinabe dried mangoes are EU organic certified, inhibition of oxidase activity by sulfite treatment is not applied. Air in plastic bag is removed manually as far as possible at a time of packing. However, products become brown color gradually and it loses commercial value about 6 months after the production. No antioxidant is used in Burkina Faso (Processors and exporters do not know about it).

3) Improvement of Profitability

Burkinabe dried mangoes are organic certified and target markets are basically different from the ones of sugar-added products in Thailand and Philippines. Although it is very limited, non-sugar added dried mangoes are produced in Thailand. Mali, Peru, Mexico and South Africa produce organic dried mangoes for exports. It is necessary to make efforts to reduce the production costs to keep the price competitiveness and to increase the profit.

i) Utilization of Waste: Processed Foods Production with Pulp around Seeds

Fruit pulps around seeds are wasted and its utilization is one of important issues to improve the profitability. In other countries, pulp around seeds is utilized by large-scale processing facilities operated by companies such as puree production and mango roll production. The puree production facilities of ITFC in Ghana (visited in the pilot activity) are all South African made and its initial cost was about 60,000 USD. Such facility is too big for artisanal processors in Burkina Faso in terms of investment cost, management capacity and material supply.

Jam, wine, vinegar is possible products to make by use of fruit pulp around seeds. However, there are many difficulties such as to master processing method, to procure equipment/tools, to develop product and its package, to find/create outlet and so on. In case Burkinabe dried mango processor aims to enter into overseas markets, it is proposed to find a foreign partner (foods importer, wholesaler) in a target country. Because all tools and consumables such as package/label with good design, refractometer, densitometer, wine yeast, sanitizing agent, preservatives are to be imported from overseas. Learning of processing method and hygiene control and designing of processing facility also require the supports of experts. Fortunately, customers of dried mangoes are fair-trade/organic shops in Europe and this relationship should be fully utilized to look for a foreign partner.

ii) Utilization of Waste: Biogas Production

Waste can be used to generate biogas. It is already popular technology in many developing countries but it has been introduced only in some drying facilities which received NGO supports or a facility operated by exporter having a head office in Europe.

iii) Development of Technology for ATESTA Dryer Modification

Except the South African dryers introduced with support of PAFASP, all dryers are ATESTA dryer. It does not use electricity and fabricated locally at a moderate price from 1 to 1.2 million FCFA per unit, therefore it is the dryer adapted for the circumstances in Burkina Faso. However, ATESTA dryer has some defects such as; it needs to change the positions of each drying trays (up and down and front and rear) periodically, very low air velocity and no way to adjust airflow and quality (color and dryness) is uneven. As described earlier, drying trays are wooden made and it is hard to wash way fluid burnt and stuck to wooden frame and small wood pieces may be

mixed in the products.

It is said that there are about 400 units of ATESTA dryers and the processors will keep using them for the time being. Therefore, solution for the defects should be developed.

4) Common Issue for Improvement of Hygiene/Product Quality/Profitability

i) Improvement of Access to Foreign Made Materials/Tools

Available industrial materials/equipment in Burkina Faso is very limited. Some drying facilities import equipment by themselves and foreigner/NGO are very often involved in the importation. Most of facility owners (Burkinabe) have poor access to foreign technology. Language barrier and limited access/use of the Internet are assumed as underlying reasons.

5) Enhancement of Production Capacity

i) Introduction of Dryers with Force-air Circulation, Temperature Control Function and Stainless/Plastic Trays

It is necessary to increase the number of dryer/drying facility to increase the dried mango production although the production can be raised to a certain degree by raising operation rates of existing dryers.

It is not recommended to increase the number of ATESTA dryers. A dryer with force-air circulation, temperature control function and stainless/plastic trays should be introduced /promoted.

6) Expansion of Sales Outlet

i) Acceleration of Sales Promotion by Exporters

Same as the case of fresh mango exports, Burkinabe dried mango exporters are small-scale companies and their financial capacity is limited. The financial support for the exporters is very effective to accelerate their activities to expand sales and to find new outlets. Concretely, costs for taking part in overseas trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting foreign buyers, and conducting foreign market survey shall be subsidized.

(2) Promotion Measures

1) Improvement of Hygiene

i) Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs

To fulfill the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs”, 1) Understanding the requirements of the EU regulation, 2) Improvement of processing facility/equipment, 3) Enhancement of preventive measures against contamination risks in the operation, 4) Improvement of management system of hygiene control (implementation of risk management based on the HACCP principles), 5) Hygiene education for workers are necessary.

The processors who challenge to improve hygiene status on his/her own motive are to be supported technically and financially. Regarding the facility improvement priority shall be given to the processing facilities built by modifying an ordinary house. Renovation (hiring worker, procuring materials, supervising work) shall be carried out by processor with technical support. Processor who has no knowledge/experience of carpenter/tiling/plaster/plumbing works shall be supported from the planning stage.

ii) Support to Attain the HACCP Certification

The processors who have fulfilled the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs” are to be supported to attain the HACCP certification.

2) Improvement of Product Quality

i) Introduction of Antioxidant for Product Storage

The two major exporters of dried mangoes have interest in the equipment/materials used in the pilot activity and are positive about importation. Consumable for quality improvement such as antioxidant and heat sealer are to be imported on commercial base by the exporters.

ii) Improvement of ATESTA Dryer

To be described in the next section of 3) Improvement of profitability

3) Improvement of Profitability

i) Utilization of Waste: Processed Foods Production with Pulp around Seeds

To produce jam, wine, vinegar by use of fruit pulp around seeds, dried mango processors will have to overcome many difficulties such as mastering processing method, procuring equipment/tools, developing product, marketing and so on. Therefore, it is proposed to find a foreign partner by making the most use of business relationship with fair-trade/organic shops in Europe, or to make the fair-trade/organic shops a partner.

The processors who challenge to develop processed foods production with pulp around seed with foreign partner are to be supported financially. In particular, support a part of initial cost for product development to promote the attempts by the processors.

ii) Utilization of Waste: Biogas Production

The processors who attempt to install biogas facility are to be supported technically and financially. Concretely, know-how of building the biogas device, operation and maintenance shall be provided. Also the materials which are essential to build the device but hard to find in Burkina Faso are to be provided.

CIR-SNV PROJECT (commenced in July 2014) has a plan to provide training on building biogas device, its operation and maintenance.

iii) Development and Dissemination of Technology for ATESTA Dryer Modification

There are about 400 units of ATESTA dryers and the processors will keep using them for the near future. Therefore, solution for the defects (i.e. technology for ATESTA dryer modification) should be developed to improve the product quality, food safety and profitability.

The fact that almost no improvements was made in the 18 years period indicates that users/craftsmen have no ability to invent the modification. Therefore, development of technology for ATESTA dryer modification should be conducted by foreigner expert (donor).

The good results were attained in the test for ATESTA dryer modification in the pilot activity. The modification by use of circulation fan and digital thermometers increased air velocity, reduced the gas consumption, and improved the product by lowering drying temperature. Also, the equipment and guidance for modification of 20 dryers were provided to the 20 processors in the pilot activity.

Information of user evaluation (easy/difficulty to modify, usability, quality improvement, fuel reduction) should be gathered. And if the user evaluation shows positive answers, the modification technology invented by JICA team is to be disseminated. In addition, it is proposed to conduct a test of another way of modification by use of locally available cheap exhaust fan.

4) Common Issue for Improvement of Hygiene/Product Quality/Profitability

i) Improvement of Access to Foreign Made Materials/Tools

Most of facility owners (Burkinabe) have poor access to foreign technology. Language barrier and limited access/use of the Internet are assumed as underlying reasons. However, no measures against these issues are proposed in the promotion plan.

The importations of equipment/materials used in the pilot activity (circulation fan, thermometer and plastic trays) are addressed as a matter of issues to be solved by donor in the promotion plan. Consumables are to be imported on commercial base by exporters.

5) Enhancement of Production Capacity

i) Support for the Procurement of Material Mangoes

To expand the production of material mangoes, organizing of producers into groups and obtaining of organic certification is necessary. Exporters/processors already have the know-how for doing it. The exporters/processors who work on arranging procurement of materials mangoes from new producers groups are to be supported financially.

ii) Introduction of South African Dryers

A South African dryer has the capacity equal to about 10 units of AETSTA dryer. To introduce South African dryer, large-scale renovation of building or construction of new facility is required. In addition, production volume as well as volume of material mangoes increases a lot. Therefore, only large scale processors can introduce the South African dryer. The processors are to be supported financially to promote the introduction of South African dryer.

iii) Introduction of Smaller Size Dryers

Introduction of small size dryer (equal to 1 - 2 units of ATESTA dryer, equipped with force-air circulation, temperature control function and stainless/plastic trays) which is suitable for medium-small scale processors is to be promoted. Since the Japan-made dryer is expensive, it is proposed to look for the manufacturers/exporters in India and/or Turkey. Looking for manufacturers/exporters of suitable dryer in India and/or Turkey is not easy task and assistance of foreigner expert is required.

The processors are to be supported technically and financially to promote the introduction of new-type of small size dryers.

6) Expansion of Sales Outlet

i) Acceleration of Sales Promotion by Exporters

Financial support for the exporters who work to find buyers and to expand sales is to be provided. Concretely, subsidize the costs for take part in trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting buyers and market survey.

6.3 Pilot Activity for Export Promotion of Dried Mangoes

6.3.1 Outline of the Pilot Activity

(1) Background and Objectives

Dried mangoes are produced by small-scale processors (mostly individual business) in Burkina Faso. Most of dried mangoes are exported to the European countries as organic certified and/or fairtrade certified products. Wooden-made gas dryer; commonly known as ATESTA dryer is used for drying. It does not use electricity and is fabricated by local craftsmen at a moderate price, therefore it is the one adapted for the circumstances in Burkina Faso. However, ATESTA dryer has defects in hygienic aspect, quality control and drying efficiency. In addition, hygiene control in the processing facility/method is not in an adequate level in many facilities.

The demands of organic/fair-trade dried mango in European markets appear steady. However, the requirements on food safety of developed nations will become increasingly severe. The continued effort to improve hygiene/quality control to meet the market requirements should be made by processors; not to lose the current customer and to get new overseas customer. In addition, utilization of pulp around seeds and improvement of ATESTA dryer should be considered to improve profitability and product quality.

Therefore, the following hypotheses regarding improvement of hygiene control, improvement of product quality and profitability, and sales promotion were verified in the pilot activity for export promotion of dried mangoes. The results and lessons learned from the activity were reflected to the promotion plan to enhance the feasibility of the promotion plan.

(2) Hypotheses to be Verified and Related Promotion Measures

Five (5) activities were implemented; they were 1) Study tour to the advanced dried mangoes processing facility in Ghana, 2) Test for ATESTA dryer modification, 3) Product improvement based on the Japanese market requirements (improvement of manufacturing technique), 4) Trial implementation – Support for modification of ATESTA dryers (test of partial grants method) and 5) Support for sales promotion (support to enter Japanese market).

Hypotheses, promotion measures and five activities are summarized as follows.

Table 6.3.1 Hypotheses to be verified in the Pilot Activity

Issues/Promotion measures	Pilot Activity	Hypotheses to be verified
(1) Improvement of hygiene control		
Promoting the awareness/understanding of processors to improve hygiene/quality control	1) Study tour to the advanced dried mangoes processing facility in Ghana	- Awareness can be improved by showing the high-level hygiene/quality control being practiced in a mango drying facility in Ghana.
Improving the techniques applied for production and hygiene/quality control	3) Product improvement based on the Japanese market requirements (improvement of manufacturing technique)	- Processing facility can be renovated by use of local materials/skilled workers to meet the Code of Practice: General Principles of Food Hygiene. - Contamination control and work efficiency can be improved by the instructions. - Browning of product color can be mitigated by use of anti-oxidant.
	2) Test for ATESTA dryer modification	- Wooden tray can be replaced with a ready-made plastic tray available in Japan.
Improving the access to foreign made materials/tools	2) Test for ATESTA dryer modification	- To judge who is better to import materials/equipment from overseas - Exporters or PTRAMAB.

Issues/Promotion measures	Pilot Activity	Hypotheses to be verified
(2) Improvement of product quality and profitability		
Promoting the utilization of the waste by dried mango producers	1) Study tour to the advanced dried mangoes processing facility in Ghana	- To let the processors judge a feasibility to introduce aseptic puree production from pulp around seeds in their business; by showing the facility/business of aseptic puree production in Ghana.
Improvement of ATESTA dryer	2) Test for ATESTA dryer modification	- ATESTA dryer can be modified by use of equipment widely available in Japan (uneven dryness, proper temperature control, etc.)
	4) Trial implementation – Support for modification of ATESTA dryers	- To judge the needs of processors to improve ATESTA dryer and adequate subsidy rate
(3) Enhancement of processing capacity		<No pilot activity>
(4) Support for sales promotion		
Enhancing the exporters' sales promotion activity	5) Support for sales promotion (support for enter into Japan market)	- Sale promotion activity can be promoted by providing financial support for overseas trade show. - New buyers of Burkina Faso dried mango can be identified in overseas trade show.
Promoting the product improvement based on the buyer's requirements	2) Test for ATESTA dryer modification	- Modified ATESTA dryer can lower the drying temperature from 70-80 degree to 50-60 degree centigrade without prolonging drying time, and it must improve the hardness and flavor of the product.
	3) Product improvement based on the Japanese market requirements (improvement of manufacturing technique)	- Same as above

(3) Intervention by the Pilot Activity in the Value Chain

The pilot activity intervened in processors and exporters to contribute to improve hygiene control and product quality based on the market requirements of developed countries, and also to contribute to enhance sales promotion of dried mangoes.

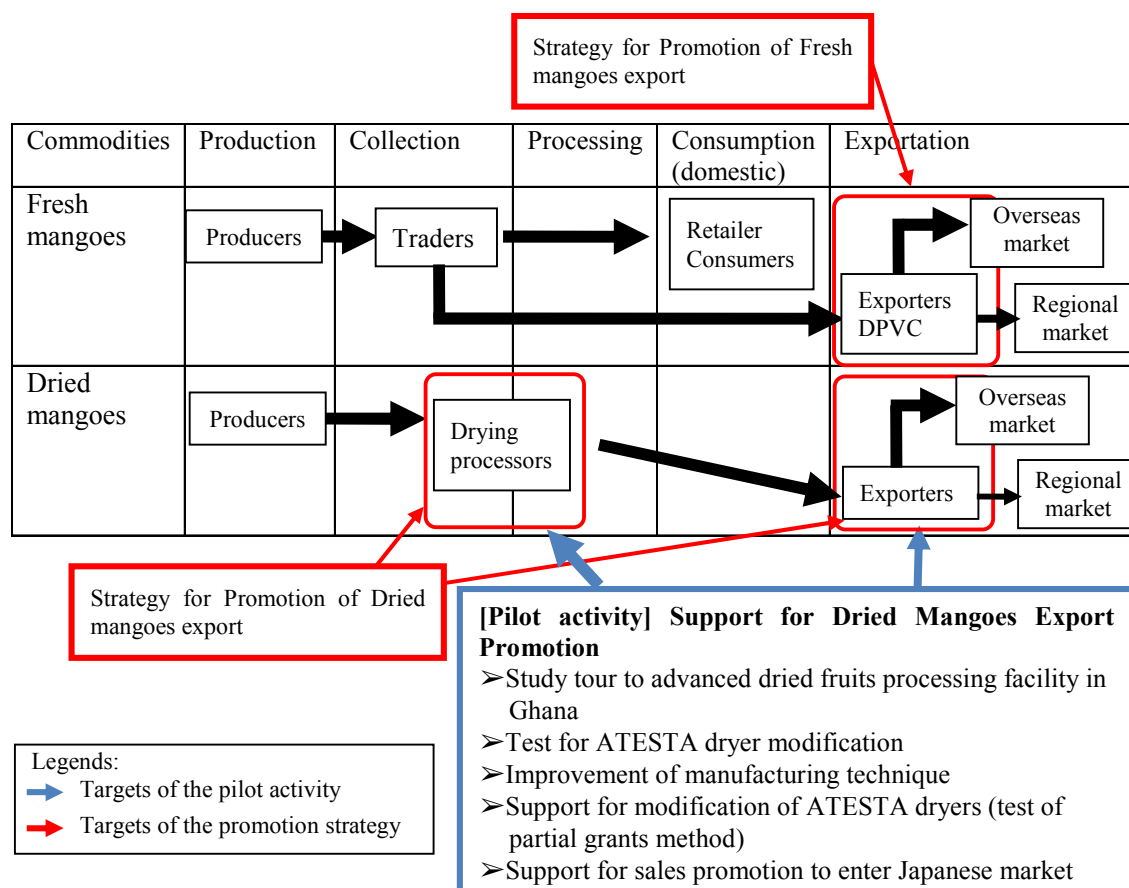


Fig. 6.3.1 Intervention of the Pilot Activity in the Value Chain of Mango

(4) Contents of the Pilot Activity

1) Implementation Areas

The activities of 2) Test for ATESTA dryer modification and 3) Product improvement based on the Japanese market requirements (improvement of manufacturing technique) are conducted in Bobo-Dioulasso.

2) Target Groups

Dried mango processors and exporters

3) Implementation Period

May 2014 to March 2015

4) Implementation Organization

JICA team, DGPER and PTRAMAB

5) Contents of the Activity

i) Study Tour to the Advanced Dried Mangoes Processing Facility in Ghana

A study tour to the mango drying facility (Integrated Tamale Fruit Company/ITFC) in Ghana was conducted. There were two purposes; 1) to let dried mango processors aware/understand the

importance to improve hygiene/quality control by showing a high-level control being practiced in ITFC, and 2) to let processors judge the technical and financial feasibility to introduce an aseptic puree production from pulp around seeds in their business by showing a facility of aseptic puree production in ITFC.

ii) Test for ATESTA Dryer Modification

A priority issue in ATESTA modification was to attain a uniform temperature distribution in a drying chamber. By achieving this, it was expected that man-power for changing the positions of drying trays must be reduced and product quality (uneven dryness) must be improved.

The modifications were made by JICA team by use of equipment brought from Japan, such as 1) small circulation fan for uniform temperature distribution in chamber and speeding-up of drying, 2) probe-type thermometers for proper temperature control, 3) several kinds of plastic mesh sheets with various mesh spacing for identifying the best one in terms of products quality, workability and price, 4) plastic trays to replace wooden trays.

Modification tests were conducted in two drying units in Bobo-Dioulasso.

iii) Product Improvement based on the Japanese Market Requirements (improvement of manufacturing technique)

The supports for the improvement of manufacturing technique and processing facility to improve the product quality include the food safety/hygiene control were provided. Regarding the hygiene improvement, improvement of operation and renovation of facility by use of local materials/skilled workers were supported in order to meet the CODEX's Code of Practice: General Principles of Food Hygiene. Regarding the quality improvement, drying tests by use of the modified ATESTA dryer were carried out. It was intended to lower drying temperature from current 70-80 degree to 50-60 degree centigrade without prolonging drying time, and drying at lower temperature was expected to improve hardness and flavor of the product. Anti-oxidative agent plus degassed packing was tested to prevent the color deterioration during storage period.

The hygiene improvement was conducted at the same drying units where the test for ATESTA dryer modification was conducted.

iv) Trial Implementation - Support for Modification of ATESTA Dryers (test of partial grants method)

“ii) Test for ATESTA Dryer Modification” modified only 2 units of dryers. To diffuse the results of modification test among dried mango processors, the number of modified dryers was to be increase a little more. The support (provision of equipment with partial grants) was provided to modify another 20 units of ATESTA dryers.

The notification of support scheme to dried mango processors, reception of applications, and selection of participants were conducted by PTRAMAB.

v) Support for Sales Promotion (support to enter Japanese market)

The assistants to enter Japanese market were provided for the dried mango processor and exporter. To be precise, JICA team promoted the product in Japan (found the buyers and brokered the trade), and supported the dried mango processor and exporter to take part in the Foodex Japan 2015 held in March 2015.

6.3.2 Implementation and Results of the Pilot Activity

(1) Study Tour to the Advanced Dried Mangoes Processing Facility in Ghana

1) Dried Mangoes Processing Facility in Ghana

Integrated Tamale Fruit Company (ITFC) in Tamale

2) Trip Schedule

19 Oct. Bobo-Dioulasso → Ouagadougou
20 Oct. Ouagadougou → Tamale
21 Oct. ITFC
22 Oct. Tamale → Ouagadougou → Bobo-Dioulasso

It was planned to visit ITFC during the mango processing season. However, ITFC requested to make it after the season end to avoid the risk of contamination.

3) Participants and Selection Procedure

After fixing the visiting date at 21 October, selection of participants was carried out according to the procedure discussed and determined in the stakeholders' meeting held in 17 July 2014. JICA team prepared the explanatory paper (including the application form) and PTRAMAB held the meetings to explain the program to the processors (for both PTRAMAB members and non-members). Reception of applications and selection of participants were made by PTRAMAB.

The deadline of application submission was 19 September, and 36 processors (units) applied against the maximum limit 25 participants (one person from each unit). Selection of 25 participants by PTRAMAB was made on 20 September. By adding SATIG (drying facility for "Test for ATESTA Dryer Modification" and "Product improvement based on the Japanese market requirements", applied but was not selected), total 26 processors were selected.

A DGPER official planned to join the study tour, but she could not join because the mission paper was not obtained in time. The 26 participants were owner or quality manager of drying unit.

4) Results

It took a lot of time to pass the boarder and many police checkpoints in Ghana, and the rental bus arrived Tamale town at around 19:00 on 20 October. To make matters worse, some of the booked rooms in two guest houses were not available. It was after 21:00 when all participants got room to sleep. Some of the participants could not have breakfast the next morning. In spite of these unfortunate situations, the participants vigorously visited ITFC on the following day.

According to the questions made by the participants at ITFC and written comments, one of the purpose; "to let dried mango processors aware/understand the importance to improve hygiene/quality control" was judged as achieved. However, the number of participants who wrote about "what is possible to apply in my facility" in the comments were limited. Therefore, participants who got specific idea for improving hygiene/quality control were limited.

Showing a facility of aseptic puree production by use of pulp around seeds gave the participants great impression. However, none of the participants made a comment to try to introduce it by himself/herself. Most of the comments about the aseptic puree production facility were asking financial and technical support from JICA. Reasons for making such comments were regarded as; initial investment is too large (60,000 USD), processors cannot procure equipment from overseas, outlets of puree is uncertain.

As was obvious, none of the participants got enough knowledge about puree production since they just looked the facility and had a brief explanation in the tour.

Study Tour to the Advanced Dried Mangoes Processing Facility in Ghana



Photo in the drying facility was not allowed.

(2) Test for ATESTA Dryer Modification

1) Selection of Test Site

Pre-site survey was carried out in Feb. 2014 and candidate sites were identified. In May, after the processing season started, JICA team visited four (4) candidate sites to observe the actual situation, and then DANAYA and SATIG in Bobo-Dioulasso were selected.

2) Modification and Test Run

Modification (installation of small circulation fan and probe-type thermometers) and test run was made at DANAYA at first by use of unused dryer which had a unique horizontal chimney. Based on the result, an ordinary ATESTA dryer at SATIG was modified a little different way and test runs were carried out. Since the good result was attained in the test runs at SATIG, DANAYA's dryer was modified again and tested.

Since DANAYA and SATIG had the benefit of facility renovation for hygiene improvement, very good support for modification and conducting test runs were provided.

3) Results of the Modification of ATESTA Dryer

Installation of circulation fan, installation of louver to adjust wind direction, modification of exhaust opening, modification of bottom metal plate, and installation of digital thermometers were made.

Modified ATESTA Dryer



Results of the test runs

- Considering the price and motor size, circulation fan with 80mm runner diameter was selected for the test. Air volume of this fan was not enough to attain uniform temperature distribution in the chamber. Therefore, man-power for changing the positions of drying trays could not be reduced. However, temperature difference in the chamber was reduced.
- Higher air velocity dries mangoes faster. Three (3) trays in the lowest part get highest air velocity and hottest (dry) air supply from the bottom, and mangoes dry quickly. Based on this result, new layout of trays/partition boards and method of tray change was invented (see the figure below).
- Gas consumption was reduced, uneven dryness was reduced and drying temperature was reduced as shown in the tables and figures below. Drying time also reduced some hours from

18-20 hours by ordinary ATESTA. By keeping drying temperature at around 60 °C, product quality was improved; softness and mango flavor was kept.

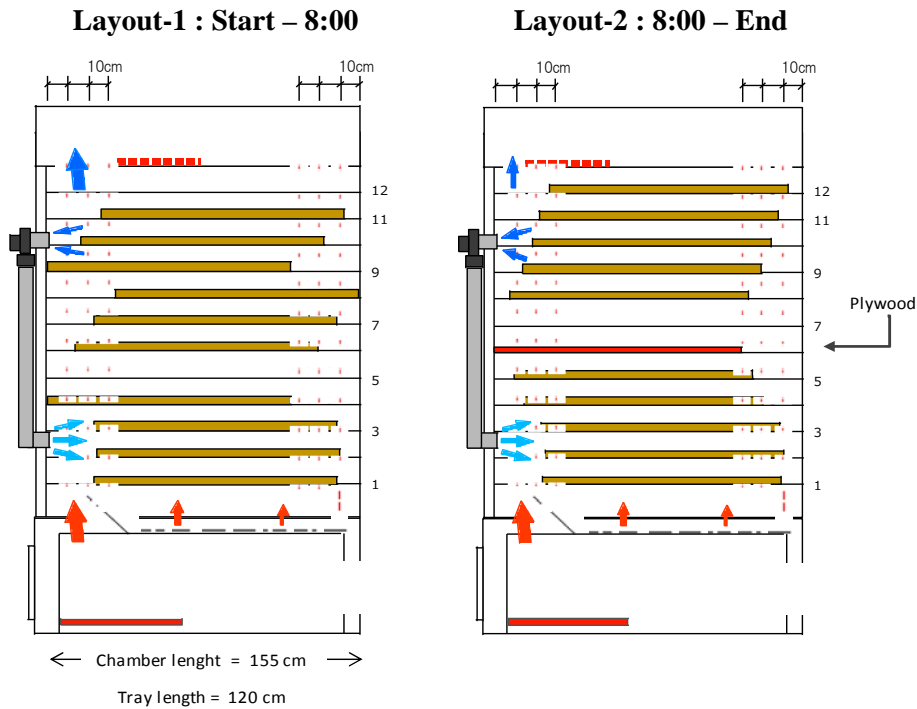


Fig. 6.3.2 New Layout of Trays and Partition Boards

Table 6.3.2 Comparison of Gas Consumptions

Test runs at DANAYA

Type of dryer	ATESTA dryer (with unique chimney)	ATESTA dryer (forced exhaust with fan)	Modified ATESTA (with circulation fan)
Gas consumption (m ³)	2.79* ¹	3.16* ²	2.38, 2.45* ¹

Product type: Strip cut; Volume of material fruits: *1 = 50 kg (measured), *2 = 84 kg (estimated)

Test runs at SATIG

Type of dryer	ATESTA dryer (ordinary type)	Modified ATESTA (with circulation fan)
Gas consumption (m ³)	2.67* ³	1.71* ⁴

Product type: semi oval slice; Volume of material fruits: *3 = 60kg (estimated), *4 = 50kg (measured)

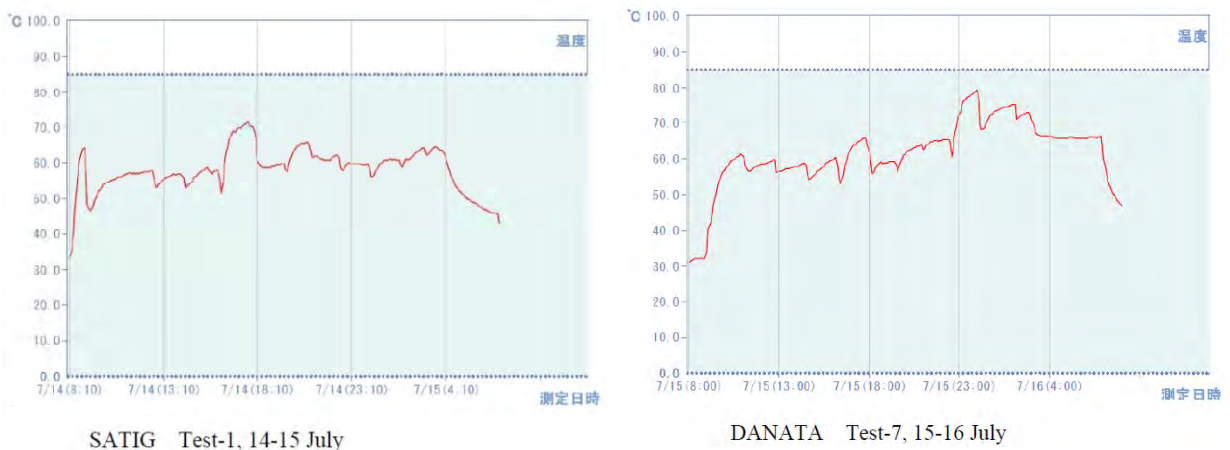


Fig. 6.3.3 Temperature in the Chamber of Modified ATESTA (middle part)

4) Results of Testing the Mesh Sheets and Plastic Trays

Following three types of plastic mesh sheets were tested.

Table 6.3.3 Tests Results of Mesh Sheets

Type	Price in Japan	Test results
HDPE mesh (called Tricarunet) width 62 cm	1,800 FCFA/m (380 JPY/m)	High possibility of heat deformation under the current way of drying (no thermometers and high temperature)
Nylon mesh width 107 cm	4,665 FCFA/m (983 JPY/m)	High heat resistance. Low possibility of heat deformation under the current way of drying.
Tetron mesh width 114cm	6,497 FCFA/m (1,369 JPY/m)	

* 1 EURO = 655 FCFA = 138 JPY

HDPE mesh is the cheapest among the three types and it is easy to handle. HDPE meshes on the lower trays (near gas burner) were deformed by heat at SATIG with ordinary ATESTA dryer; by ordinary way of drying without thermometers. On the other hand, DANAYA kept using it without heat deformation with ATESTA dryers equipped with forced exhaust system with fan, which has relatively low temperature (75 °C at lower part).



HDPE Mesh (called Tricarunet)



Heat Deformation

Following two types of plastic trays were tested.

Table 6.3.4 Tests Results of Plastic Trays

Type (Product name)	Price in Japan	Test results
Seirou Type-4 (Gray color) dimensions: 709×653×94mm	11,900 FCFA/pcs. (2,500 JPY/pcs.)	High possibility of heat deformation under the current way of drying (no thermometers and high temperature)
Puraebira M (Yellow color) dimensions: 1210×603×47mm	13,500 FCFA/pcs. (2,840 JPY/pcs.)	

* 1 EURO = 655 FCFA = 138 JPY

“Seirou Type-4 (Gray color)” was selected since it fit to the ordinary ATESTA dryer having chamber width of 73cm. DANAYA kept using it without heat deformation with ATESTA dryers equipped forced exhaust system with fan. Since the heat deformation was predicted, Seirou Type-4 was not tested with ordinary ATESTA dryer; by ordinary way of drying without thermometers.

“Puraebira M (Yellow color)” is used in Japan for shiitake mushroom dryers. It was tested at DANAYA with ATESTA dryer with unique horizontal chimney after installing digital thermometers. Wooden bars were newly-fixed in the chamber by a local carpenter to hold Puraebira M trays. Drying test was made at maximum temperature of 75 °C at the lower part. As a result, all trays in the chamber were deformed due to uneven positions of newly-fixed wooden bars (poor skill of local carpenter) as shown in picture below. Dried mangoes do not stick to Puraebira M trays (advantage).



Left:
Seirou Type-4 (Gray color)

Below:
Puraebira M (Yellow color)



5) Summary of the Results of Modification Tests

Problems of ATESTA dryer and the results of modification tests are summarized as follows.

Table 6.3.5 Problems of ATESTA Dryer and Results of Modification Tests

	Problems	Modifications applied and results
Hygiene risk / Food safety risk	Wooden frame tray: Fluid sticks to wooden frame by heat and it is hard to remove even by washing. There are chances small wood pieces and nails come out from the frame and mix in the products.	Introducing the plastic tray: → No wood pieces and nails come out. Easy to wash away fluid. Thus, food safety risk is greatly reduced. However, plastic trays should be used in a dryer equipped with thermometers to avoid heat deformation.
Quality control	Many of ATESTA dryers have no thermometer or thermometers are non-functioning. Therefore, processors judge drying temperature by seeing the size of flame. Many of processors try to dry faster and make flame larger, and then mangoes are dried by high temperature (over 80 degree C at lower part). As a result, surface of products become hard and mango flavor is lost.	Introducing the digital thermometers with more than 100cm code: → Possible to measure any points in a chamber. → Possible to control temperature precisely Introducing the circulation fan and modifying the exhaust opening adaptable: → High air velocity dry mangoes faster → Heated (dried) air is reused and gas consumption is reduced.
Drying efficiency (cost reduction)	Natural convection (slow air velocity). No way to adjust the exhaust opening.	Tested to dry mangoes at 68-75 degree C (at lower part): → Gas consumption reduced max. 35%. → Drying time (gas burning time) was 16 hours; a few hours were shortened. → Product quality is improved: Soft and rich mango flavor. → No heat deformation in the plastic trays (Seirou Type-4) and plastic mesh sheets (HDPE mesh-Tricarau-net)

(3) Product Improvement based on the Japanese Market Requirements (improvement of manufacturing technique)

1) Selection of Drying Units

Pre-site survey was carried out in Feb. 2014 and candidate units were identified. In May, after the processing season started, JICA team visited four (4) units to observe the situation of processing work and facility. DANAYA and SATIG in Bobo-Dioulasso were selected. Following conditions were applied for the selection.

- a) Number of site (unit) is two. Both units should be in Bobo-Dioulasso town to save time for traveling and procuring building materials.
- b) Middle scale unit with 5 -10 dryers. Facility level is moderate.
- c) Management of tools/equipment and facility in the off season is not very bad.
- d) Agree to provide an ATESTA dryer for the test modification and help to conduct test runs.

2) Improvement of Facility and Work Method to Improve the Hygiene and Work Efficiency

Supports for the two units were commenced in early June after searching and procuring the tools and materials for renovation in Ouagadougou. Some improvements such as foot washing system, alcohol + atomizer for disinfecting hands and table top, and hanging curtain at entrances are new to dried mango processors in Burkina Faso. The improvements made in the processing facilities and work methods are shown in the next table.

The processing facility of DAYANA was built by modifying an ordinary house, and the layout of work spaces and work space are restricted. Work spaces for peeling/cutting and putting mangoes on trays are not enough. Extensive renovation was impossible to make in the processing season (time/budget also limited). As a result, DANAYA's facility has not yet reached the satisfactory level as food processing facility from a standpoint of Japanese; i.e. it has not yet fully meets the CODEX's Code of Practice: General Principles of Food Hygiene.

The processing facility of SATIG was designed and built for a mango processing (drying) purpose. However, it had no wastewater system (including septic hole) and no washing facilities. The room layout was simple and no problem. Work spaces also had no problem. If SATIG can implement the further renovation to be covered by him; installing a partition wall to make a tool storage space, mortar or tile the floor of conditioning room, mortar and paint the wall of new changing space, installing additional fluorescent lamps, SATIG's facility can be OK as food processing facility.

Most of the workers in the drying facility are women. Peeling and cutting are all done by many women manually. For those women, what they do at home (cooking and handling of food) is the standard, and it is not easy to make them understand and practice the rules/requirements in the food processing facility for export products.

Table 6.3.6 Improvement of Facility and Work Method Made in the Two Units

1.	Introducing the foot washing system: Workers come to work with sandal and work with barefoot in the facility. There are great risks of contamination. → Foot washing facility (water taps, tiled basin, bench, water supply/drainage) were installed. Footwear for workers, shoe box, door mat + chlorine disinfection were introduced.
2.	Installing/improving changing room: DANAYA: Curtain and rack for hanging work clothes were installed. SATIG: Room space was newly built.
3.	Improving the hand washing: Wash stand (steel-made rack with basin & tap, water supply/drainage) were installed. Nail brush were introduced.

4.	Improving the peeling/cutting work room (wet area): SATIG: Floor was tiled, Wall was mortared and painted (lower half), Floor/wall corners were curved, Drain outlet on floor was installed. DANAYA: Floor and wall (lower half) were tiled, Wall (upper half) was mortared and painted, Floor/wall corners were curved, Window was renewed.
5.	Replacing the work table in the peeling/cutting work room (wet area): SATIG: Table of steel-made frame + plywood and aluminum-sheet covered top was introduced. DANAYA: Table of steel-made frame + plywood and vinyl-cloth covered top, detachable was introduced.
6.	Improving the storage of drying trays (Do not directly put trays on the floor): Wood base was introduced.
7.	Improving the material mangoes washing place: SATIG: Floor was tiled, Drainage and roof was installed, Steel-made rack for water basin was introduced. DANAYA: Mold on the wall was removed, Wall was mortared and painted, Water tap was installed, Rain gutter and drainage pipe was installed.
8.	Improving the preventive measure in the conditioning/packing room: Alcohol + atomizer for disinfecting hands and table top were introduced. SATIG: 80 L plastic buckets with lid were introduced as stands for plastic basins (Do not put plastic basins on the floor)
9.	Improving the wastewater management (to stop discharging wastewater to public road): SATIG: Septic hole and drain pipes were installed. DANAYA: Floor level/slope angle of garbage car parking place and waste piling place were modified.
10.	Improving the waste (peels and seeds) handling: SATIG: Number of garbage buckets with lids was increased.
11.	Preventing flies enter into the facility: SATIG: Steel meshes on all windows were renewed, Hanging curtains at entrances were installed, Anterior room in the entrance was built.
12.	Improving the toilet: DANAYA: Floor was mortared and tiled to drain water. Hand washing basin (tap, water supply/drainage) was installed.
13.	Sample of work clothes (Japan made, for food processing work) were provided.

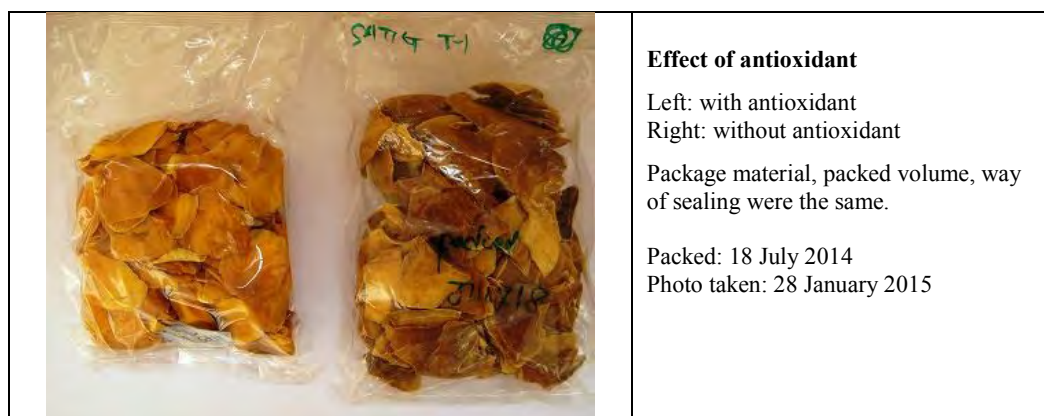
3)Improvement of Product Quality

Regarding the improvement of product quality, “Improvement of facility and work method” addressed the food safety/hygiene improvement. “Test for ATESTA Dryer Modification” addressed the food safety/hygiene improvement and product quality improvement as previously mentioned.

In addition, test for the effect of antioxidant and test of 10mm slicer were conducted.

i) Test for the Effect of Antioxidant (deoxidizer)

Samples for comparison were prepared in July 2014 to check the effect of antioxidant (such as “AGELESS”) in dried mangoes storage. As shown in the following pictures, it has great effect in preventing browning. Exporters have started a study how to get antioxidant in Europe, after seeing the obvious effect.



In the course of preparing the test samples, the followings situation was revealed.

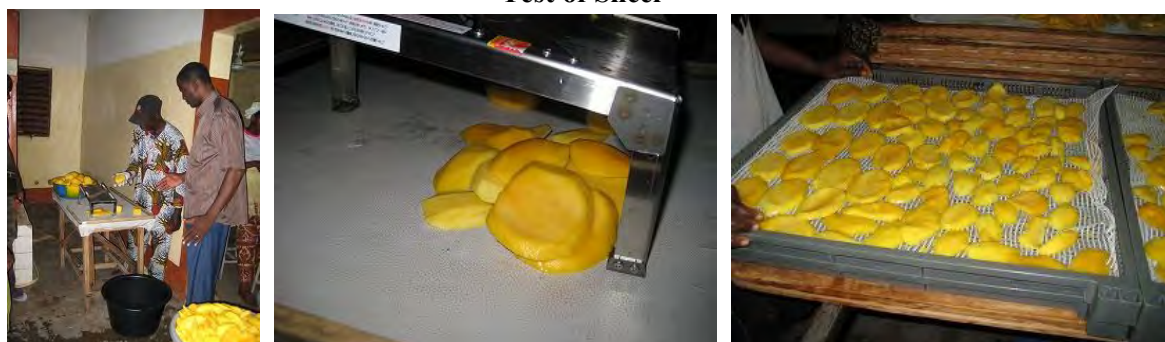
- Plastic bag should be sealed by 10mm width heat sealer when using the antioxidant. Also, it is recommended using plastic bag made of low oxygen penetration film. Unfortunately, both of them are not available in Burkina Faso now. (Of course antioxidant is not available in Burkina Faso).

ii) Test of 10mm Slicer

It was considered that uniform cut size can improve the quality of products, and 10mm manual slicer (made in Japan) was tested. With this slicer, 4 cuts were obtained from a large size mango. Flesh remains around seed needs to be cut by hand knife, thus the work speed was slow. A comparison of product quality between tool sliced and hand sliced was not conducted.

Product sample of 10mm slice was prepared and presented to Japanese importer (African Square). Their evaluation was “Attractive looking. It must be marketed as premium products.”

Test of Slicer



(4) Trial Implementation – Support for Modification of ATESTA Dryers (test of partial grants method)

1) Selection of Participants

Participants were selected at the same time of selecting the participants for Ghana study tour. 34 processors (units) applied and 20 units were selected by PTRAMAB on 20 September.

34 drying units out of 45-50 drying units in Burkina Faso applied. It indicates that many processors have interest/needs of ATESTA modification.

2) Procurement and Distribution of Equipment/Materials

Japanese-made equipment shown below was distributed to the 20 units with 10% cost burden by beneficiary.

Table 6.3.7 Equipment/Materials Procured

Item	Quantity	Carried by JICA Team	Sea Shipping
Plastic tray (Seirou Type-4)	800 psc	0	800
Circulation fan	40 units	20	20
Digital thermometer	80 units	40	40

Japanese-made equipment were sailed out from Yokohama port on 17 Sep. by CMA CGM/DELMAS Line and arrived in Bobo-Dioulasso dry port on 17 Dec. After the custom clearance as duty free cargo, equipment were carried to SATIG’s processing facility on 21 Dec. Distribution of equipment to the 20 units were completed in 28 Dec.

A part of the equipment was hand carried by JICA team to use/distribute them in the explanatory meeting on the method of modification and operation (demonstration) held in 13-14 Oct. at SATIG's facility. All the 20 units participated the meeting (10 units/day x 2 times) and paid their cost burden in cash. A manual for modifying ATESTA dryer by using circulation fan and its operation was prepared by JICA expert, and it was delivered to each units.

3) Modification of ATESTA Dryer by the Participants

As of end of Feb. 2015, more than half of the 20 units have completed the modification (installing circulation fan, adjusting chamber size for the plastic trays). The remaining units are expected to finish the modification before the processing season start; before the middle of March.

The owner of SATIG mastered the method of modification perfectly in the two times of demonstration made in the explanatory meeting. He supported some units to modify the dryer by request.

(5) Support for Sales Promotion (support to enter Japanese market)

The assistance activities to enter Japanese market were provided for dried mango processors and exporters.

1) Supports Made during March - Dec. 2014

JICA team canvassed the booths of potential buyers (wholesaler/importer of dried fruits) in Foodex Japan 2014 (March) with dried mango sample of DANAYA.

As a result, business with two Japanese companies was started in 2014. African Square Co., Ltd. (imported dried mangoes from COOPAKE in Orodara in 2013 season) imported 200kg in April and another 200kg in August from DANAYA. Shidachi Co., Ltd. (wholesaler) imported 100kg via African Square in the end of season (DANAYA could not supply the product due to the end of season. Therefore, African Square provided the COOPAKE's product to Shidachi).

Web shop of African Square

African Square commercializes the Burkina Faso's dried mango with AMBESSA & CO in Japan.

The screenshot shows the African Square website interface. On the left, there is a product listing for 'ブルキナファソ BOBOのドライマンゴー 100g ECOPACK 無添加・砂糖不使用'. The right side shows a detailed product page for 'Burkina Faso Bobo Mango Brooks (ブルキナファソ ホホマンゴー・ブルックス)'. It includes a table with product specifications and a shopping cart icon.

Number	Size	Net Wt	Price
amf015m	Mini Pac	40g	¥400 (+TAX)
amf015e	Eco Pac	100g	¥800 (+TAX)
amf015b	Business Pac	1000g	¥4,400 (+TAX)

Left : http://www.african-sq.co.jp/catalog/ec/products/list.php?category_id=301

Right: <http://www.ambessa.jp/product/bobomango.php>

2) Supports for Participation in Foodex Japan 2015

JICA team assisted the dried exporters to take part in the international food and beverage exhibition (Foodex Japan) held annually in March at Makuhari in Japan.

i) Determination of the Participants

Foodex Japan is the place for business talks. Therefore, JICA team decided to inquire about the participation to two major exporters of dried mangoes in Burkina Faso (i.e. Burkinature Sarl and Gebana Afrique Sarl). Details of support to be provided by JICA (50% of air fare, 50% of travel allowance based on the DGPER regulation) and their cost burden were explained.

Gebana Afrique participated in Foodex Japan in 2012 and 2013; in JETRO booth. However, no new business was materialized, therefore Gebana Afrique declined. Burkinature had some experiences in overseas exhibitions such as Biofa in Germany. Burkinature showed willingness to take part in the exhibition in Japan. In addition, Burkinature showed interest in importation of thermometer, fan and antioxidant. Since Gebana Afrique declined, JICA team proposed the participation to DANAYA (participant of pilot activities and exported his product to African Square in 2014) in Jan 2015, and DANAYA agreed readily.

Just before the departure, a DGPER official was joined in the participants.

ii) Exhibited Commodities

In addition to dried mango, following export commodities of Burkinature Sarl were marketed in the Foodex Japan.

- Dried mang : Oval slice, Strip slice
- Sesame : Whitish, Bigaree (mixed color)
- Bisap : Whole flower, Cut and sift (C/S), tea bag cut (TBC), Crushed
- Shea butter : Yellow, White

(All commodities are EU organic certified and Fairtrade certified)

iii) Preparations done by JICA Team

The application for Foodex Japan 2015 was submitted in the end of August 2014. Afterward, following preparations were made by JICA team.

- a) Preparation of dried mango sample: SATIG's product (dried with modified ATESTA dryer) was packed with antioxidant in August 2014 and stored in DGPER office. Instructed DANAYA to make his product sample with early variety.
- b) Preparation of sesame, bisap and shea butter samples: Instructed Burkinature Sarl to prepare the samples.
- c) Designing of booth décor and posters, and determination of booth decorator.
- d) Designing of leaflets and posters for the commodities in Japanese, and printing.
- e) Requesting for the cooperation of African Square Co., Ltd.
- f) Preparation of invitation letters, and sending them by mail
- g) Travel arrangement for the participants

iv) Result

The three participants arrived at Narita on 01 March. Preparation for the booth was performed next day and they visited African square company at Gotanda after it.

During the exhibition (4-days; from 03 to 06 March), the participants worked in the site all days; explained about the commodities at the booth and canvassed the booths of potential buyers (wholesaler/importer of dried fruits) in the site. The members of JICA team assisted them as interpreter. As the result, contacts of 25 potential buyers were obtained in four days. Four companies out of 25 were considered as having a low chance of doing business. The remaining 21 companies were sorted out as follows.

Table 6.3.8 Potential Buyers (Japanese companies: 15)

Type	Commodity of most interest					Sum
	Dried mango	Sesame	Bissap	Shea butter	Cashew nut	
Importation and wholesale	6	2	1		1	10
Wholesale	1			1		2
Fair Trade	2	1				3
Sum	9	3	1	1	1	15

- Some companies showed interest in some commodities. In this case, sorted by a commodity of most interest.
- Invitation letters (with entry tickets) were mailed to 55 companies, however, only 3 companies (all were operators of fair trade business) appeared.
- Cashew nut was not an exhibited commodity. However, a company of next booth requested an information and price offer to Brukinature.

Table 6.3.9 Potential Buyers (Overseas companies: 6)

Location	Type	Commodity of interest
UAE (Dubai)	Trading company	Sesame
UK (London)	Trading company	Dried mango
South Africa	Dried mango maker / exporter	Dried mango
South Africa	Beverage maker / exporter	Bissap
Taiwan	Sesame products maker / exporter	Sesame
Singapore	Trading company	Shea butter

Among the 15 Japanese companies, two wholesalers were not capable of importing by themselves. Therefore, importation through African Square Co., Ltd was proposed to them. African Square started importation of Burkinabe dried mangoes in 2013 and imported DANAYA's products via the intermediation of JICA team in 2014. African Square has been importing various food/beverage products from African countries and has launched an own brand (African Table) to promote African food items in Japan. Moreover, African Square visits West African/ Burkina Faso several times in a year to make purchases. Because of these, African Squire can be a very good business partner for small-scale Burkinabe exporters to enter into the Japanese market.

Samples of dried mango were distributed to anyone who stopped at the booth. There were no bad comments given; quality (taste) was very much appreciated.



Upper-left: Appearance of the booth

Upper-right: Minister of MARHASA (Burkina Faso) visited the booth in 03 March.

Left: Explaining about Burkinabe dried mango to the South African dried mango maker/exporter in the Foodex

(6) Stakeholder Meeting

A stakeholder meeting was held on 17 July in Bobo-Dioulasso, and a total of 14 dried mango processors and exports participated in the meeting.

The contents and results of pilot activities carried out in the period from May to July; in particular ii) Test for ATESTA dryer modification and iii) Product improvement based on the Japanese market requirements were explained. Equipment/tools (circulation fan, thermometer, plastic mesh sheets, plastic trays) used for the test of ATESTA dryer modification, antioxidant and product dried by the modified dryer were displayed in the meeting.

The contents of upcoming activities; i) Study tour to the advanced dried mangoes processing facility in Ghana and iv) Trial implementation - Support for modification of ATESTA dryers were explained.

Method/procedure for selection of participants for the upcoming activities was discussed. As a result, it was decided that “JICA team prepares the explanatory paper (include the application form) and PTRAMAB explains the program to the processors (for both PTRAMAB members and non-members). Receiving of applications and selection of participants is carried out by PTRAMAB.”

6.3.3 Lesson Learned and Issues

(1) Modification of ATESTA Dryer

1) Effect of the Modification and Needs of the Drying Processors

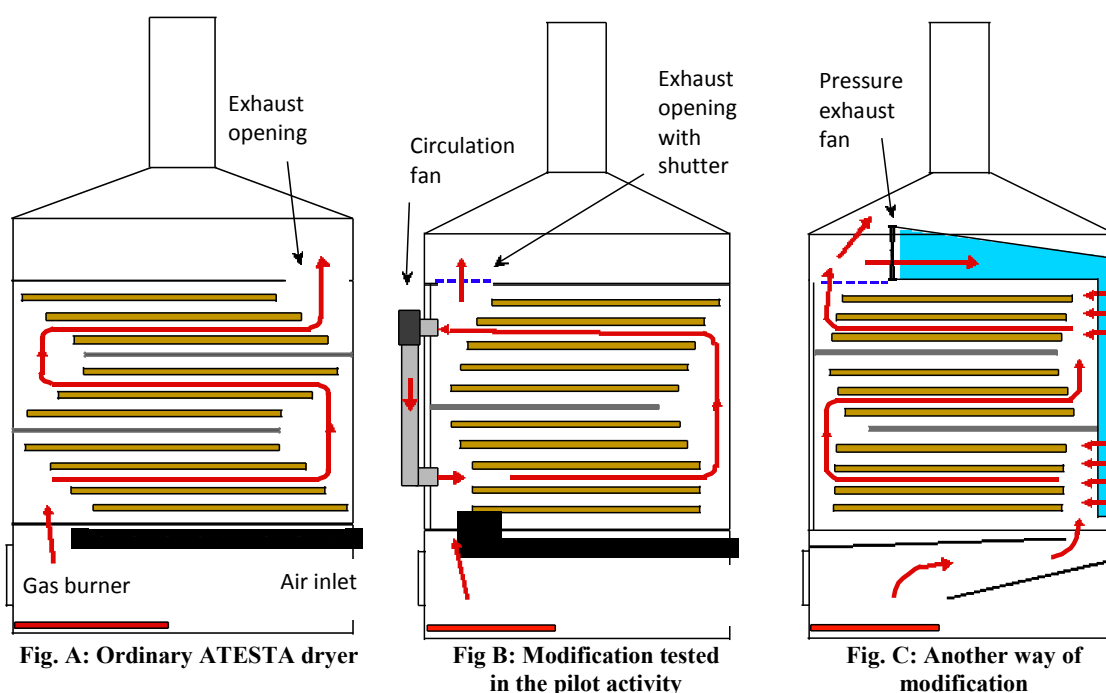
The modification by use of circulation fan and digital thermometers increased air velocity, reduced the gas consumption, and improved the product quality (soft and rich mango flavor) by lowering drying temperature to 68-75 °C (at lower part) and by proper temperature control.

34 drying units out of 45-50 drying units in Burkina Faso applied the “Trial implementation – Support for modification of ATESTA dryers”. It indicates that many processors have interest/needs of ATESTA modification. Also it is confirmed that a partial grants method is feasible.

2) Test for Another Way of Modification

At the time of planning of pilot activity, available equipment/materials in Ouagadougou were studied to find the ways of modification (i.e. how to increase air velocity and circulate air in a drying chamber). Unfortunately, small pressure exhaust fan, punched metal sheet, and metal processing factory capable to make a steel duct were not found in Ouagadougou. Therefore, considering the fact that all industrial materials are imported, it was decided to use Japanese made circulation fan and locally available PVC pipe for modification as shown in Fig. B below.

However, if small pressure exhaust fan, punched metal sheet and someone who can custom-make a steel duct are available in Burkina Faso, another way of modification (as shown in Fig. C) may be possible.



A shop selling a small-size steel-made exhaust fan was found in Ouagadougou after the test modification. This fan is Chinese made and cheap price (17,000 FCFA), and shop said it is regularly available. Although the specification of this Chinese fan is unknown (shape of fin does not look like “pressure fan”), it worth trying to test the Fig. C modification with it.

Regarding another problems on locally available materials, following measures are proposed based on the experience in working with local carpenters and procuring many kinds of building materials locally.

- Punched metal sheet: It is not sold in shops and there is no metal workshop to order-make it. Instead of punched metal sheet, use timbers (width 50mm, thickness 10mm) and screw/nail them equally-spaced intervals horizontally. Or use 10-15mm plywood and make holes manually
- Custom-made steel duct: Instead of steel sheet, use aluminum roofing sheets and rivets to form a duct. Or use 5-10mm plywood and timber.

For both of the alternative method, it is essential to use a skillful and careful carpenter and Japanese

(foreigner) expert should instruct and supervise the work. Also proper tools (such as sharp wood saw, riveter, metal scissors, electric drill, etc.) should be provided to a local carpenter.

3) Notes on the Introduction of Plastic Trays

Ready-made plastic trays for drying farm products (shiitake mushroom, etc.) and for steaming small fish were procured in Japan for the test with ATESTA dryer. As a result, plastic tray was deformed by heat when it was used under the current way of drying; i.e. no thermometers and high temperature. Therefore, plastic tray should be introduced together with circulation fan and thermometers; i.e. modification of ATESTA dryer is the prerequisite condition for using plastic trays.

The widths of ATESTA dryer are not uniform; it varies facility by facility; in some facilities it varies one by one. Therefore, there are many dryers which need to adjust chamber width to use plastic trays.

(2) Improvement of Facility and Work Method to Improve Hygiene and Work Efficiency

1) Problems Observed in the Dried Mango Processing Facilities

In reference to the “Code of Practice: General Principles of Food hygiene, CAP/RCP 1-1969, Rev. 3 (1997)” of CODEX and the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs”, hygiene /food safety problems observed in the two processing facilities are described below. Not only the two facilities supported by the pilot activity, many other facilities have more or less similar problems.

i) Problems on the Facility/Equipment

There are many processing facilities that are built from modifying an ordinary house. Such facilities often lack the appropriate layout, design, construction and size as food processing facility. In short, they are bad layout, narrow and non-washable. In concrete, they are as follows.

- a) Bad layout: there are risks of cross contamination.
- b) No enough space (too many workers (dryers) against the available work space).
- c) Walls are rough surface.
- d) No way/difficult to wash floor with water (There are no drain outlet and water supply in the rooms).
- e) No effective preventive measures against insect (fly) enter into the facility. Processors understand that conditioning room requires the highest level of control, but preventive measures against insect and dust are not enough.
- f) Windows have structure that dust/dirt accumulate. In addition, burglar bar and mesh net on windows make a cleaning difficult.
- g) Waste water/rain water management: Drainage to a septic hole is often on surface (waste water flow in open ditch; not underground by pipe). Lack of septic hole(s) in the facility and discharge waste water to public road.
- h) Washing facility/equipment: Lack washing facility for tools/buckets/mesh net; wash them with large basin outside on earth (It is common to do washing outside with bucket).
- i) Facility for workers: Hand washing facility (number of tap) is not enough against the number of workers. Lack appropriate changing room. No flush lavatories.
- j) Product storage: Lack/no enough separated storage space for products. Products are often kept with tools/packing materials.

-
- k) Storage for tools/packing materials: Lack of proper storage. Tools are kept empty space such as behind dryers and no regular cleaning is practiced. There are chance to allow rats/insects stay and breed. (Rack/shelving unit is not widely used; it is hard to find a ready-made shelving unit in shops).
 - l) Lighting: Too dark for checking dryness of products in the nighttime. Fluorescent lamps lack covers to prevent the contamination when lamp is broken.
 - m) Work table for peeling/cutting: Locally made wooden tables are used. Wood legs get mold. Some parts of table top (covered with Formica (synthetic resin board) or vinyl-cloth) are broken/cut.
 - n) ATESTA dryer: Lack of thermometers and no proper control of temperature are practiced. Wooden frame trays are hard to clean well. There are chances small wood pieces and nails come out from wood frame and mix in the products.

ii) Problems in the Work Method/Management regarding Prevention of Contamination

- a) Workers come to work with sandal and work barefoot in the facility. There are great risks of contamination.
- b) There are some workers who do not wear work clothes.
- c) Work clothes are piled.
- d) Work cloth lack mechanism to prevent skin hair drop through wrist.
- e) Workers do not clearly understand about contamination risks (not well instructed/trained); e.g. which parts of room have a possibility to be polluted.
- f) Too many workers against work space and number of tools and containers. So, some workers do work at inappropriate place/manner.
- g) Peeling, cutting, conditioning and packing are done by bare hands. Many workers touch the material/product. Disinfecting hands with alcohol is not practiced. Cheap disposable gloves are hard to find in shops.
- h) Lot/batch control is not in detail (not segmented well).
- i) Standard procedure and responsible person for cleaning work are not specified (no written procedure).
- j) Food safety program and procedure based on the HACCP principles is not practiced (not known).

2) Way of Supporting the Processors to Improve the Level of Hygiene/Quality Control

Initially, at a time of ITR, it was planned to increase the level of hygiene/quality control by giving on-site instruction to the low level facilities (owners) by the high level facilities (owners). However, it is concluded that cooperation among the processors and accepting other processors' instruction are not feasible. Also, it is considered that visiting (study) of the processing facilities of high level of hygiene/quality control in Burkina Faso (such as Fruiteq) by low level processors (competitors) may be hard to implement.

3) Way of Renovating the Processing Facility

Renovation of processing facility in Burkina Faso is carried out by using of local workers such as carpenter, tiler, plasterer, plumber and metal worker. There is no choice left. Unfortunately, skill level of these local workers is not high and they can only do what they did before. They often make mistakes when they are requested unknown requirements. Good finish in down to the millimeter scale (sometimes in centimeter scale) is impossible. Therefore, facility owners are required to have

very clear image of finish state and understand how to renovate his/her facility. Also owner has to give instructions to local workers and has to supervise the work. However, facility owners (processors) are not always capable to do it.

(3) Improvement of Access to Equipment/Materials (importation of equipment/materials)

Importations of equipment/materials are indispensable to carry out the modification of ATESTA dryers and improve products quality.

Exporters of dried mangoes provide the financial support and packing materials. Of course they know about the importation procedure. In addition, the exporters showed interest in the plastic trays, circulation fan and antioxidant and positive about importation. On the other hand, PTRAMAB can be a window to the processors in a donor support project but has no capacity to search and procure equipment from overseas. Therefore, it is obvious that the exporters of dried mangoes are the best to do the importation of equipment/materials.

(4) Role of PTRAMAB in Donor Support Project

PTRAMAB explained the support scheme to the processors (for both PTRAMAB members and non-members), received the applications and selected the participants for the “Trial implementation – Support for modification of ATESTA dryers”.

PTRAMAB has no permanent staff and operation fund. Moreover, some said that there dislike situations among the mango processors and bad feeling to the board members. Therefore, the PTRAMAB’s capacity to carry out the participant selection and the response of processors against PTRAMAB’s decision was checked.

As a result, the board member could not plan the detail method/procedure for announcement, explanation of the support scheme and receiving of applications. But once the detail of procedure was fixed by support of JICA team, the board member carried out the selection. The board member set the selection criteria (i.e. membership fee is paid, continuously produced in the past few years) and selected the participants. No complaint about the decision of the board members was given from the rejected processors to JICA team.

Since the PARTAMAB made the [membership fee is paid] one of the conditions to get the support, many processors paid the membership fee. As a result, the number of units paid the member fee increased to 40 from about 20. It is estimated that there are 45-50 units which work seriously for dried mango production. Therefore, now most of the drying units are formal member.

6.3.4 Feedback to the Promotion Plan

The results, lessons learned and opinions of stakeholders obtained in the pilot activity were reflected to the promotion plan to enhance feasibility of the promotion plan. The feedbacks are as follows.

(1) Modification of ATESTA Dryer and Dissemination of the Invention

The good results were gained in the “Test for ATESTA Dryer Modification” and, during October-December, necessary equipment and guidance for the modification of 20 dryers (1 dryer per processor) were provided to the 20 processors in the “Trial implementation – Support for modification of ATESTA dryers”. However, the coming processing season starts in April and there will be no time to get the information of user evaluation (easy/difficulty to modify, usability, quality improvement, fuel reduction) since the project comes to its end. In addition, as explained in the previous chapter 6.3.3 (1), another way of modification by use of the locally available cheap exhaust fan is worth trying. Therefore, a) user evaluation of the modification invented by JICA team and b) modification test with locally available exhaust fan shall be a part of the promotion plan.

(2) Improvement of Hygiene

Currently the majority of dried mangoes are exported to Europe and it is considered as urgent issue to meet the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs”. The promotion plan for the improvement of hygiene/food safety at the time of the Interim Report (ItR) shall be altered as follows.

Table 6.3.10 Altered Points on Support for Improvement of Hygiene

	Plan in ItR	Final Plan
Title	Setting up and implementing a program of “individual on-site consultation” (A part of the Project on Enhancing the PTRAMAB’s activities for the improvement of hygiene/quality control)	Improvement of hygiene control to meet the EU food hygiene regulation
Implementing body	PTRAMAB	Donor
Way to increase awareness of processors	Observation of advanced hygiene/quality control in the dried fruits processing facilities in Ghana	Observation of advanced hygiene/quality control in the dried fruits processing facilities in Ghana/Burkina Faso Seminar on the EU food hygiene regulation, etc.
Way of pointing out the necessary improvement to be made Way of instructing the improvements (methods of improvement)	Low level processing facilities are to be upgraded by an individual on-site consultation. Establish a system (program) in which the advanced processors teach the low level ones.	A team of local HACCP consultants and foreign expert point out and instruct the improvement
Financial support for renovation of facility/equipment	Partial grants	Partial grants by donor fund (project)
Design of renovation, procurement of materials/workers, supervision of renovation work	No support	Local experts (architect, technician) or foreign expert shall support the processors to design, procure and supervise.

(3) Improvement of Access to Overseas Equipment/Materials

Initial plan to support the importation of foreign-made materials/tools by PTRAMAB (A part of the Project on Enhancing the PTRAMAB’s activities for the improvement of hygiene/quality control) shall be abandoned. It is judged that dried mango exporters are capable of looking for and importing equipment/materials. Consumable for quality improvement such as antioxidant, heat sealer and thermometer should be imported on commercial base. Therefore, no promotion plan shall be prepared to support the importation (dissemination) of such items by exporters.

(4) Role of PTRAMAB in the Promotion Plan (donor’s support project)

Many of the dried mango processors participate in the PTRAMAB (pay a membership fee) to receive donor support. The consensus about the target/role/function of the association has not yet been built among the processors; whether PTRAMAB aims to carry out the activities independently such as overseas promotion, technical information service to members, formulate project and get support from government/donor or aims to exist just as a contact point for donor support as it is now.

Although it is in such a situation, the necessity/importance of PTRAMAB never increases without tangible benefit for the processors. And solidity among the processors can be improved by challenging a common issue together. Therefore, the promotion plan shall be planned to give PTRAMAB the involvement (roles/works) as far as possible.

6.4 Promotion Plan for Mango

6.4.1 Framework of the Promotion Plan

(1) Principle of Planning

Fresh mangoes and dried mangoes are exported regularly and steadily to mainly European market. The promotion plan aims to expand the exports of these two commodities.

The promotion plan is a plan for support for the actors of export business (private sector) as mango producers, dried mango processors and exporters. The government/donor (public sector) intervene and support to solve the issues which are hard to challenge for the actors due to limitation of financial and/or technical capabilities and which are assumed to go nowhere if it is left to the actors

Following points are defined as principle or condition for planning under the above basic policy.

- a) Support for processors and exporters are limited to the cases that indirect benefit of mango producers is assumed; except for a support to promote an experimental activity.
- b) The promotion plan assumes the implementation by donor support. Since the donor's aid policy and scheme/mechanism are varied, projects are to be planned to have a scale/content easy to select for donors according to their circumstances.
- c) Project-type support is to be planned if actors need both financial and technical supports to solve the issues. In case it is judged that the issue can be solved with financial support only (i.e. no technical support is required), no project-type support is to be planned for such issue.
- d) Promotion plan for dried mango are formulated based on the results and lessons of the pilot activity.
- e) Necessity of PTRAMAB never increases without tangible benefit for the processors. Solidity among the processors can be improved by challenging a common issue together. Therefore, the involvement (roles/works) of PTRAMAB is to be planned as far as possible.
- f) Mangoes need the number of years to start fruiting after planting. The planning assumes that there are mango fruits possible to catch up the expansion of exports.

(2) Target Duration

5 years

(3) Target Area

The Promotion Plan for Mango provides supports to the exporters and dried mango producers, and no specific target area is set in the planning. The major mango production areas (Cascades and Hauts-Bassins provinces) and Ouagadougou may be called as target area since many of the producers and exporters are based in these areas.

(4) Vision

The expansion of exports targets the market of non-EU Europe, Mediterranean countries and Persian Gulf countries where current exports are still limited. In parallel, the efforts to maintain and expand the exports to EU countries are continued. The expansion of exports is made by accelerating the sales promotion by exporters. Along with the expansion of outlet, increase the production of mangoes suitable for fresh exports and enhance the conditioning capacity for air mangoes.

Burkina Faso's dried mangoes are produced and exported to Europe as organic certified products and fair-trade product. They have steady/firm buyers and the demands of European markets appear steady.

However, many drying facilities have problems as food processing facility and the hygiene control/food safety management based on the HACCP principles is not well-practiced. The current outlet in EU market is assured by improving food hygiene to meet the requirements of EU. Along with the improving food hygiene, the expansion of exports is made by accelerating the sales promotion by exporters and quality improvement, cost reduction and expansion of productivity by processors.

Mango producers who supply to the export value chains of fresh mango or dried mango obtain the higher farm-gate prices compared to the selling price on the domestic markets. The Promotion Plan aims at expanding the exportation by promoting the various attempts to be made by the exporters and dried mango producers, and then increasing the number of mango producers who benefit from the export value chains.

(5) Goal

1) Fresh Mango Exports

- Increasing the volume: 500 tons/year (by air) *assumption: current exports 5,000 tons/year
- New outlet: 3 countries

2) Dried Mango Exports

- Increasing the volume: 100 tons/year (material mango 2,000 tons) *assumption: current exports 500 tons/year
- New outlet: 3 countries

6.4.2 Promotion Strategies and Programs

(1) Fresh Mango

Promotion strategies and programs to promote fresh mango export are shown below. The promotion strategies for fresh mango are 1) Expansion of sales outlet, 2) Enhancement of production of exportable mangoes and 3) Enhancement of conditioning capacity according to the promotion measures shown in the section 6.2.1. (2). The programs are supportive measures for exporters.

1) Expansion of Sales Outlet (Promotion Strategy 1)

To realize this strategy, “program for expansion of sales outlet of fresh mango” is established.

i) Strengthening of Information-gathering Capacity of DPVC

To clarify new target countries for fresh exports, information about phytosanitary regulation/measure against Burkina Faso mangoes is essential. Strengthen the information-gathering capacity of SCPQ in DPVC by deploying a new staff that has adequate English proficiency (Arabic proficiency when possible) and allocating necessary budget for operation of information-gathering activity.

SCPQ 1) collects information about phytosanitary regulation/measure against Burkina Faso in line with exporter’s ideas, 2) shares information with exporters, 3) studies measures/actions to be taken to promote the mango exports and 4) keep the collected information.

However, the necessary inputs are very limited and the action should be taken by SCPQ-DPVC to materialize the strengthening is very clear. Further description is omitted from the section of Projects.

ii) Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries

First of all, the target countries should be determined to promote the exports. APEMAB (mango exporters association) gathers information for export marketing such as import regulations, demand/supply situation, exports by competing countries, buyer information, logistics cost and so on. Together with the phytosanitary information to be obtained by DPVC, APEMAB determines the target countries based on the opinions of member exporters.

APEMAB's information-gathering activity is supported financially to accelerate the determination of target countries. The supportive measures are planned as a donor support project.

iii) Acceleration of Sales Promotion by Exporters

The exporters who work on finding buyers and expanding sales in the determined target countries are supported financially. Concretely, the costs for taking part in trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting buyers and market survey are subsidized.

iv) Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

In order to create the funding source for association activities, collection (imposition) system of contributions on mango exports within APEMAB is established. Financial and technical supports to APEMAB throughout the process from designing the system to commissioning it are provided. The supportive measures are planned as a donor support project.

2) Enhancement of Production of Exportable Mangoes (Promotion Strategy 2)

To realize this strategy, "program for enhancement of production of exportable mangoes" is established.

i) Increase of Production Area by Small-medium Producers

Financial support for the exporters who work on increasing the production areas by small - medium producers is provided. The costs for organizing producers, procuring seedlings, training on orchard management and attaining of Global GAP are subsidized.

ii) Irrigated Mango Production in Non-polluted Area by Fruit Fly

Financial support (loan with low interest) for individual/corporate body to challenge growing mango trees in very dry area (non-polluted area by fruit fly) with irrigation is provided.

3) Enhancement of Conditioning Capacity (Promotion Strategy 3)

To realize this strategy, "program for enhancement of conditioning capacity" is established.

i) Installation of Small-scale Conditioning Facility for Air Mangoes

Financial support (loan with low interest or subsidy) for the exporters to install or renovate the small-scale packing facility and cool storage is provided.

As stated in the Principle of Planning above, no project-type support is to be planned if it is judged that the issue can be solved with financial support only (i.e. no technical support is required). Following four (4) supportive measures for the exporters fit for such cases.

Table 6.4.1 Financial Supportive Measures for Fresh Mango

Program	Supportive Measure
Expansion of sales outlet of fresh mango	· Acceleration of sales promotion by exporters
Enhancement of production of exportable mangoes	· Increase of production area by small-medium producers · Irrigated mango production in non-polluted area by fruit fly
Enhancement of conditioning capacity	· Installation of small-scale conditioning facility for air mangoes

(2) Dried Mango

The promotion strategies for dried mango are 1) Improvement of hygiene, 2) Improvement of product quality and profitability and 3) Enhancement of production capacity and 4) Expansion of sales outlet; according to the promotion measures shown in the section 6.2.2. The programs are supportive measures for dried mango processors and exporters.

1) Improvement of Hygiene (Promotion Strategy 1)

To realize this strategy, “program for improvement of hygiene” is established.

i) Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs

There is an urgent need to fulfill the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs”. Following four (4) countermeasures are taken.

- a) Making the processors understand the requirements of the EU Regulation.
- b) Improving the processing facility/equipment.
- c) Enhancing the preventive measures against contamination risks in the operation; including hygiene education for workers.
- d) Improving the management system of hygiene control (implementing the risk management based on the HACCP principles).

The priority in improving the processing facility is given to the facilities built by modifying ordinary houses. The processors who challenge to improve hygiene status on his/her own are supported technically and financially. Enhancement of preventive measures against contamination risks and improving the management system of hygiene control is implemented in all processing facilities except ones which have already HACCP certification. The supportive measures are planned as a donor support project.

ii) Support to Attain the HACCP Certification

The processors who have fulfilled the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs” and challenge to attain the HACCP certification on his/her own are supported financially.

2) Improvement of Product Quality and Profitability (Promotion Strategy 2)

To realize this strategy, “program for improvement of production quality and profitability” is established.

i) Support to Utilize the Waste

The processors who challenge to develop processed foods production with pulp around seed and

who work on introducing biogas in the processing facility are supported financially.

Regarding the challenge to develop processed food production with pulp, the support is provided to the processors who have got foreign partner (fair-trade/organic shops in Europe or NGO). The costs for product development are subsidized.

Regarding the introduction of biogas, acquisition of materials which are essential to build the device but hard to find in Burkina Faso is supported. CIR-SNV PROJECT plans to provide the training about know-how of building the biogas device and its operation. Therefore, provision of know-how is not covered in this plan.

ii) Development and Dissemination of Technology for ATESTA Dryer Modification

Users' evaluation of the modification technology tested in the pilot activity (modification with circulation fan, digital thermometers and plastic trays) and a test of another way of modification by use of locally available cheap exhaust fan are implemented. Base on the results of the evaluation and the test, the technology to be disseminated is determined.

The modification is supported financially to accelerate the modification; i.e. subsidizes the costs of foreign-made equipment. The supportive measures are planned as a donor support project.

3) Enhancement of Production Capacity (Promotion Strategy 3)

To realize this strategy, "program for enhancement of production capacity" is established.

i) Enhance the Procurement of Material Mangoes

Financial support for the exporters and processors who work on increasing the procurement volume of materials mangoes from new producers groups is provided.

ii) Introduction of South African Dryers

Financial support for the processors to introduce South African dryers is provided. The supports are limited to large-scale processors; having over 15 tons production/year (products).

iii) Introduction of Smaller Size Dryers

Financial support for the processors to introduce new-types of small size dryers (equal to 1 - 2 units of ATESTA dryer) with force-air circulation, temperature control function and stainless/plastic trays are provided. It is judged that looking for overseas manufacturers/exporters of appropriate dryers is not easy. Therefore, the supportive measures are planned as a donor support project.

4) Expansion of Sales Outlet (Promotion Strategy 4)

To realize this strategy, "program for expansion of sales outlet of dried mango" is established.

i) Acceleration of Sales Promotion by Exporters

Financial support for the exporters who work on finding buyers and expanding sales in the determined target countries is provided. Concretely, the costs for take part in trade fairs/exhibitions, preparing sales promotion tools (poster, brochure, etc.), inviting buyers and market survey are subsidized.

As stated in the Principle of Planning above, no project-type support is to be planned if it is judged that the issue can be solved with financial support only (i.e. no technical support is required).

Following five (5) supportive measures for the processors and exporters fit for such cases.

Table 6.4.2 Financial Supportive Measures for Dried Mango

Program	Supportive Measure
Improvement of hygiene	• Support to attain the HACCP certification
Improvement of product quality and profitability	• Support to utilize the waste
Enhancement of production capacity	• Enhance the procurement of material mangoes • Introduction of South African dryers
Expansion of sales outlet of dried mango	• Acceleration of sales promotion by exporters

6.4.3 Projects

(1) Fresh Mango

1) Project for Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries

i) Background and Objective

The importation of mangoes by Europe, Russia, Mediterranean and Persian Gulf countries became 1.3 times higher during the period between 2007 and 2011. This upward trend is expected to continue. The export volume to the Mediterranean countries and the Persian Gulf countries from Burkina Faso remains at a low level; approximately 300 tons and the majority were exported to UAE and Morocco in 2012. In the case of export to the EU-27, a whole container is rejected, if a fruit-fly is found by phytosanitary inspection at arrival ports. Mango exports to the EU from Burkina Faso come to end in the middle-late June due to high risks of total losses.

Considering these situations, the expansion of exports targets the market of non-EU Europe, Mediterranean and Persian Gulf countries where current exports are still limited and a country that do not reject a whole container may exist.

Without target countries, challenges for expansion of sales outlet become diminished. It is considered that APEMAB is capable of making decision and most appropriate party to determine the targets. However, with only financial support to APEMAB, determination work may stagnate. Therefore, it is planned as donor support project; a donor directly supports (push) APEMAB to complete the task.

ii) Stakeholders and Target Group

Target group: APEMAB, Mango exporters

Organizations concerned: DGPER

Organizations concerned (information sources): APEX, MICA, CCI, DPVC, APROMAB

iii) Activities and Actors

Table 6.4.3 Activities and Actors of Project for Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries

Activity	Actors	Contents of Activity
1. Prepare a long list of target countries, Collect information for export marketing	APEMAB	Select 10 countries based on the opinions of member exporters. Collect information on logistics cost, supply/demand, export by competitors, etc.
2. Prepare a short list	APEMAB	Narrow down to 5 countries based on the collected information.
3. Collect phytosanitary information	APEMAB DPVC	Request DPVC to get phytosanitary information. If DPVC cannot collect information, APEMAB visit the candidate countries to collect information directly.
4. Determine the target countries	APEMAB	Determine the target countries (3 countries) base on the collected information.

A donor provides the financial support, advice of information sources and monitors the progress.

iv) Implementation Schedule

Table 6.4.4 Schedule of Project for Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries

Activities	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Preparing a long list of target countries, Collecting information for export marketing	APEMAB				
2. Preparing a short list	APEMAB				
3. Collecting phytosanitary information	APEMAB				
4. Determining the target countries	APEMAB				

v) Expected Effectiveness

- Target countries for promotion of fresh exports are determined.

2) Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

i) Background and Objective

It is popular in many countries that an association of producers and/or exporters of agricultural products carry out the export marketing and promotion. APEMAB (mango exporters association), established under the initiative of PAFASP, has no fund to conduct activity independently and heavily rely on donors support.

The lack of its own financial resources is the core reason for the weak associational activities. Therefore, it is proposed to create funding source for APEMAB.

In order to create the funding source for autonomous activity of the association, a collection (imposition) system of contributions on mango exports is established in the association. The project provides the financial and technical support throughout the process from designing the system to commissioning it.

ii) Stakeholders and Target Group

Target group: APEMAB and its members (exporters)

Organizations concerned: DGPER

iii) Activities and Actors

Process from Designing System to Implementation

The activities of the project are broadly planned as follows. Since the contributions on mango exports are to be paid by the exporter, designing a system of contribution should be done by the association/exporters; by those who pay money. External supports (i.e. experts or consultants) may be utilized as need arises.

Table 6.4.5 Activities and Actors of Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

Activities	Implementing bodies
1. Establishing a task-group by the members to study the possibility to build a collection (imposition) system of contributions in the association. The main point of the study is "Can get the member's agreements or not". Reporting the result of the study to the members and building consensus on starting the activities (project) for establishing a collection system. < In case of being judged as possible to build a system >	APEMAB and its members
2. Installing a committee for system designing and secretariat within the association.	
3. Designing a collection system by the committee (use external experts or consultants, if necessary).	
4. Reporting and discussing with the members (1) ~ (3).	
5. Preparing for the operation.	
6. Starting the operation	
7. Monitoring, reviewing and improving the system	

Supports to be Provided to APEMAB

The supporting parties (Donor and DGPER) provide the financial and technical support. Following supports are planned.

Table 6.4.6 Activities and Actors of Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

Activities	Supports
1. Establishing a task-group and study the possibility. Reporting and building consensus to work on the establishment of a collection system.	Advice about study method Expenses for conducting study Expenses for member meeting
2. Installing a committee for system designing and a secretariat within the association.	Expenses for office equipment for secretariat office
3. Designing a collection system by the committee.	Expenses for committee meetings Expenses for hiring experts or consultants
4. Reporting and discussing with the members (1) ~ (3).	Expenses for member meetings
5. Preparing for the operation.	Expenses for making paper forms (slip, ledger sheet, etc.) and office equipment for the operation
6. Starting the operation.	Expenses for hiring accountant
7. Monitoring, reviewing and improving the system.	Expenses for hiring experts or consultants

* Employment cost of secretariat staff is not included.

* Cost sharing should be discussed with APEMAB

iv) Implementation Schedule

This project is commenced in the 2nd year, since the "Project for Acceleration of APEMAB's Activities to Gather Export Marketing Information in order to Determine the Target Countries" is

planned to implement in the 1st year.

Table 6.4.7 Schedule of Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports

	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Establishing a task-group and study the possibility. Reporting and building consensus to work on the establishment of a collection system.					
2	Installing a committee for system designing and secretariat within the association.					
3	Designing a collection system by the committee.					
4	Reporting and discussing with the members (1) ~ (3).					
5	Preparing for the operation.					
6	Starting the operation.					
7	Monitoring, reviewing and improving the system.					

v) Expected Effectiveness

- Funding source for the export promotion activity is created.

3) Financial Support for Fresh Mango Exporters

As previously defined in the principle of planning, if it is judged that the issue can be solved with financial support only (i.e. no technical support is required), no project-type support is planned for such issue or such issue is not included in project-type support.

The following financial supports for exporters are implemented to reduce their cost burden and then, to promote their challenges to work on the issues.

The financial supports are implemented by donors' funds and/or government budget. The plan merely indicates the amount of subsidy assistance per case and number of cases in 5 years, under the assumption that subsidy rate is 50%. The activity that is hard to estimate the cost per case applies to loan with low interest rate.

Table 6.4.8 Subsidy Assistance for Fresh Mango Exporters

Intended Activity	Target Actor	Amount per case (FCFA)	Number of cases
1) Expansion of Sales Outlet: Acceleration of sales promotion by exporters			
Taking part in the trade fairs/exhibitions in the target countries, preparing sales promotion tools.	Exporters	1,500,000	25
Inviting buyers from the target countries.	Exporters	1,000,000	5
2) Enhancement of Production of Exportable Mangoes: Increase of production area by small-medium producers			
Organizing new producers into groups and training them on orchard management.	Exporters	1,250,000	5
Introducing Global GAP newly.	Exporters	1,250,000	5
3) Enhancement of Conditioning Capacity: Installation of small-scale conditioning facility for air mangoes			
Installing small-scale conditioning facility for air mangoes.	Exporter who have started exportation to the target countries	15,000,000	5

Assumption: Subsidy rate is 50%

Table 6.4.9 Loan Assistance for Fresh Mango Exporters

Intended Activity	Target Actor	Amount per case (FCFA)	Number of cases
2) Enhancement of Production of Exportable Mangoes: Irrigated mango production in non-polluted area by fruit fly			
Challenging the irrigated mango production in non-polluted area by fruit fly	individual/corporate body (exporters)		3

(2) Dried Mango

1) Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs

i) Background and Objective

Burkina Faso’s dried mangoes are produced and exported to Europe as organic certified products and fair-trade products. They have steady/firm buyers and the demands of European markets appear steady. According to the two major exporters, they had problems of contamination by dead insects and pesticide residues but they never had very serious problems on food safety/hygiene.

However, there are many drying facilities which were built by modifying an ordinary house. Such facilities have problems of food processing facility; such as bad layout, lack of water supply and drainage system. Almost none of the processing facility practices the hygiene control/food safety management based on the HACCP principles. As of 2014, among 50-60 drying facilities in Burkina Faso, only one facility had the HACCP certification.

The food safety requirements/regulations on imported foods in the developed nations become increasingly severe. It is necessary to improve the hygiene/food safety in the dried mango processing facilities not to lose the current customers and to expand sales in the developed nations.

All import foodstuffs are required to fulfill the “Regulation (EC) No.852/2004 on the hygiene of foodstuffs”. To meet the EU regulation, at the first brush, make the processors understand the requirements of the EU regulation and then, improve the processing facility/equipment, enhance the preventive measures against contamination risks and improve the management system of hygiene control (implement the risk management based on the HACCP principles).

ii) Stakeholders and Target Group

Target group: Dried mango processors, PTRAMAB

Concerned parties: Dried mango exporters, APROMAB

Supporter: DGPER, Donor

iii) Activities and Actors

(1) Explanation of the project and selection of candidate facilities

Table 6.4.10 Activities and Actors of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs (1)

Activity	Actors	Contents of Activity
1. Preparing a long list of candidate facilities	Project PTRAMAB	PTRAMAB prepare a long list. The list should indicate the facilities built by modifying ordinary house.

Activity	Actors	Contents of Activity
2. Explanatory meetings	Project PTRAMAB	Explaining the aim, contents, conditions, etc. to processors, exporters and other donor/project
3. Survey of candidate facilities	Project	Surveying the facilities to clarify the necessity of renovation

Project = Donor + DGPER

(2) To let the processors understand the requirements of the EU regulation

Table 6.4.11 Activities and Actors of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs (2)

Activity	Actors	Contents of Activity
1. Seminar on the EU regulation on the hygiene of foodstuffs	Project	Preparing the material for explaining Explaining the EU regulation to all processors and exporters
2. Observation of advanced processing facility	Project PTRAMAB	Visiting the mango drying facility of ITFC in Ghana or Fruiteq in Bobo-Dioulasso ²² Participants are processors in the long list.

Project = Donor + DGPER

(3) Improving the processing facility/equipment

- a) Number of target facilities: Priority is given to the processing facilities built by modifying an ordinary house. Assume that total number of facilities is 45 and 25 require major renovation with the project support.
- b) Financial support: Maximum 2,000,000 FCFA per facility (processor). The works equal to 20% of total renovation cost are conducted by the processor.
- c) The processors procure building materials and workers, and conduct the supervision on-site.
- d) Technical support: Processor may have no knowledge and experience of carpenter/tiling/ plaster/ plumbing works. There must be a support for planning of renovation, cost estimation, material procurement and on-site supervision.
- e) Deploying the local experts (HACCP consultants, Architect) to clarify and plan the details renovation.

Table 6.4.12 Activities and Actors of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs (3)

Activity	Actors	Contents of Activity
1. Explaining the support scheme, Selection of target facilities	Project	Explaining the contents of support, conditions/obligations, etc. to processors (facility owners). Showing them the facility renovated in the pilot project to give them clear image. Concluding the agreements.
2. Preparing the whole implementation plan and notification	Project PTRAMAB	Preparing 3 years work plan PTRAMAB notify it to the selected processors and get their consensus.
3. Preparing the cost estimation materials	Project	Preparing the standard cost for each work: tiling, mortar finishing, painting, septic hole making, plumbing, etc. Preparing the document format for Renovation Plan

²² Fruiteq built the large-scale dried mango processing facility (all equipment is South African made) in 2014. However, the company is reluctant at showing the facility to other processors.

Activity	Actors	Contents of Activity
4. Preparing the renovation plans and implementation	Project Processors	Determination of the contents/details of renovation, and estimating the renovation cost. Determination of the works to be covered by processor. Clarifying about procurement of material/workers to be done by processor. Preparation of the renovation plan. <u>Implementation</u> The renovation work shown in the next table is implemented. 3 to 4 facilities simultaneously. For the smooth progress of materials procurement and supervision, these 3 to 4 facilities should be nearby each other. The work period is 3 month. The work is conducted during Aug.-Oct., Nov,-Jan, Feb.-April, and all 25 facilities are completed in 3 years. The work begins in Bobo-Dioulasso where it is easy to procure materials and there are many facilities.
5. Monitoring in the processing season	Project	
6. Implementation of additional works (only if necessary)	Project Processors	

Project = Donor + DGPER

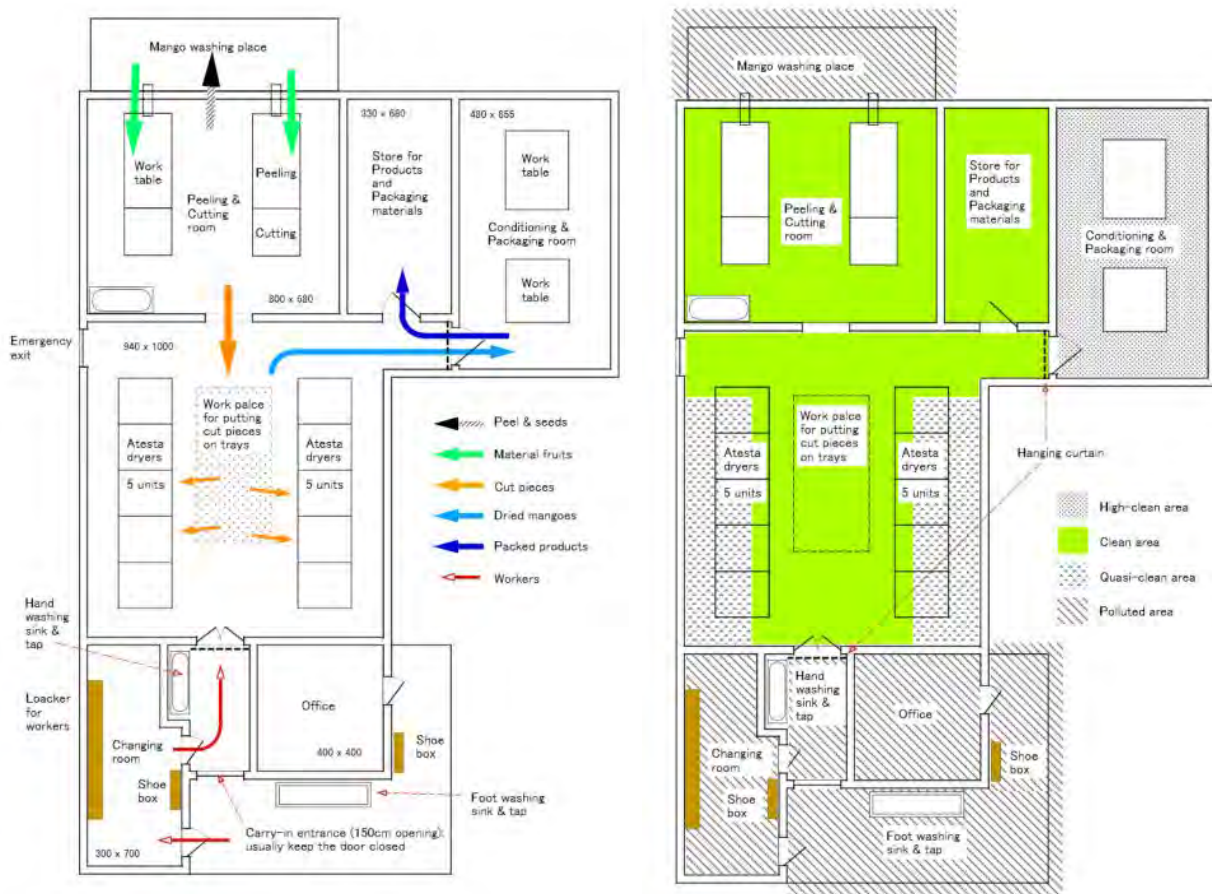
Table 6.4.13 Contents of Renovation

<ul style="list-style-type: none"> • Changing a layout to avoid risks of cross contamination (only if possible). • Smoothing wall surface in peeling/cutting room, conditioning room, and all molded wall. • Tiling the floor of peeling/cutting room, tiling or mortar finishing the floor of mango washing place and conditioning room. Installing drain outlet and water supply in the rooms. • Making corner of floor-wall round shape. • Installing ceiling in peering/cutting room and conditioning room with plastic panel. • Changing door position of conditioning room or install pre-room (if necessary). • Making partition wall in conditioning room (if necessary). • Installing mesh net on all openings to prevent insect (fly) enter into the facility. • Installing hanging curtain at doors to outside to prevent insect (fly) and dust. • Repair/replacing doors which do not close properly. Install door-closer. • Replacing windows/ burglar bar which make cleaning difficult. • Install/adding septic hole. Change surface (ditch) drain to pipe drain for waste water. • Repairing rain water leakages. Improve rain water drainage. • Installing necessary numbers of basin/tap for hand washing. • Installing appropriate changing room. Install hangers for work clothes. • Installing washing facility for tools/buckets/mesh net. • Install/adding storage for products well protected from rat and other contaminations. • Install/adding storage for tools/packing materials. • Increasing fluorescent lamps. Add covers on lamps or replace to higher position. • Replacing wood-made work table for peeling/cutting with steel-made. • Changing lavatories to flush-type.

Redesign of layout is ideal for reducing the risks of contamination and improving the work efficiency. However, such an extensive renovation is difficult to put into practice in many of the facilities. As a reference for redesigning of layout, a model layout for a facility with 10 units of ATESTA dryers (having air-inlet on the back side) is shown in the next figure. The layout is designed under the following conditions.

- a) Enforcing the foot washing system (Refer to the following section for details of the system)
- b) Entrance door admitting to the inside of facility is only one (1) during the time of operation. Emergency exit and carry-in entrance are installed but these doors are usually kept closed.
- c) It is not easy to completely stop dust/insects coming into the facility. Therefore, peeling/cutting room and conditioning/packaging room are placed at far end from the entrance door. Door admitting to each room is limited to only one (1).

- d) In addition to an installation of ceiling in peeling/cutting room and conditioning/packaging room, ceiling over the work place for putting cut pieces on drying trays (in front of dryers) is installed to prevent contamination by falling dust/insects from roofing.
- e) Waste (peel and seeds) are put in large-size buckets with lids. These large-size buckets are moved to outside of the facility (to mango washing place) through a purpose-built door/opening for heavy bucket.
- f) Sink in peeling/cutting room is installed to wash tools for peeling and cutting work (such as basin, trays and knives) in the facility.
- g) More than 1-m-wide space is secured on the back side of dryers for easy cleaning.



Flow planning

Hygiene control zoning

Fig. 6.4.1 Model Layout (reference example for redesigning of layout)

(4) Enhancing the preventive measures against contamination risks in the operation

New preventive measures in Burkina Faso are introduced. In case a foot washing system is foreseen, construction is supported in the improvement of the processing facility/equipment. This activity targets to all processors.

Table 6.4.14 Activities and Actors of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs (4)

Activity	Actors	Contents of Activity
1. Training on preventive measures against contamination risks	Project	Explaining in the preventive measures in the Seminar on the EU regulation on the hygiene of foodstuffs. Providing sample of work clothes.
2. Implementation of preventive measures against contamination risks	Processors	Processors purchase necessary materials. Processors teach workers about risks and how to use them/how to do it.
3. Monitoring and on-site instruction	Project	Monitoring in processing season. Instructing on-site.

Table 6.4.15 New Preventive Measures to be Introduced

<ul style="list-style-type: none"> • Preventing the contamination by workers barefoot: In the pilot activity, foot washing facility (water taps, tiled basin, bench, water supply/drainage), footwear for workers, shoe box and door mat + chlorine disinfection were introduced. It is recommended to apply this method, however, another method; wearing of long rubber boots and disinfecting by door mat + chlorine is also possible. • Preventing the contamination by skin hair drops through wrist: Use the work cloth with a mechanism to prevent skin hair drops through wrist. (Pilot activity has confirmed that local shop can add it on work clothes.) • Disinfection of hands and table top with alcohol + atomizer: • Using hand (nail) brushes for hand washing:
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(5) Improving the management system of hygiene control (implementation of the risk management based on the HACCP principles).

This activity targets to all processors except the ones who got HACCP certification.

Table 6.4.16 Activities and Actors of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs (5)

Activity	Actors	Contents of Activity
1. Organizing the working group for improvement of hygiene management	Project PTRAMAB	PTRAMAB and Project (including local HACCP consultants) form the working group (committee). The project teaches PTRAMAB members in working group about the risk management based on the HACCP principles.
2. Preparing the program for training and on-site instruction	Project PTRAMAB	Working group prepares the program for training and on-site instruction
3. Preparing teaching materials and handout for the training	Project PTRAMAB	Working group prepares teaching materials and handouts for the training; including a model sample of standard operation procedure.
4. Preparing teaching materials for worker education	Project PTRAMAB	Working group prepares teaching materials for workers who have limited education.
5. Implementation of trainings	Project PTRAMAB	The training targets all processors. Participants are business owners and supervisors. Trainings are conducted several times to cover all of them. Trainers are HACCP consultants and PTRAMAB members in working group. The following contents are covered. - Requirements stated in the EU regulation - What is the Risk management based on the HACCP principles? - What is the Standard operation procedure? - How to use the teaching materials for workers

Activity	Actors	Contents of Activity
6. Development of Standard operation procedure	Processors	Each processor develops his standard operation procedure by use of the model of standard operation procedure.
7. Education of workers	Processors	Each processor trains workers by using the teaching materials.
8. Conducting the Risk management based on the HACCP principles	Processor	Each processor practices his standard operation procedure.
9. On-site instruction/consultation	Project PTRAMAB	Working group visit the facilities to monitor and to do on-site instruction/consultation.

Project = Donor + DGPER

iv) Implementation Schedule

Table 6.4.17 Schedule of Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Explanation of the project and selection of candidate facilities	Project PTRAMAB					
2. To let the processors understand the requirements of the EU regulation	Project PTRAMAB					
3. Improving the processing facility/equipment	Project Processors					
4. Enhancing the preventive measures against contamination risks in the operation	Project Processors					
5. Improving the management system of hygiene control (implementation of the risk management based on the HACCP principles).	Project PTRAMAB Processors					

v) Expected Effectiveness

- All dried mango processing facilities meet the Regulation (EC) No.852/2004 on the hygiene of foodstuffs.
- Teaching materials of hygiene improvement/management system of hygiene control are prepared. If the PTRAMAB members seriously participate in the project, the capacity to carry out a regular inspection of facilities and training for new processors as association activities/services must be attained.

2) Project for Development and Dissemination of Technology for ATESTA Dryer Modification

i) Background and Objective

Wood made gas dryer called ATESTA dryer is used in Burkina Faso. It does not use electricity and is fabricated locally at a moderate price, therefore it is the dryer adapted for the circumstances in Burkina Faso. However, ATESTA dryer has some defects such as; it needs to change the positions of each drying trays (up and down and front and rear) periodically, very low air velocity and no way to adjust airflow and quality (color and dryness) is uneven. Drying trays are wooden made and it is hard to wash away fluid burnt and stuck to wooden frame and small wood pieces may be mixed in the products.

There are about 400 units of ATESTA dryers and the processors keep using them. This project aims developing the solution for defects; i.e. development and dissemination of modification

technology of ATESTA dryer.

The user evaluation of the modification technology (tested in the pilot activity; with circulation fan, digital thermometers and plastic trays) and a test of another way of modification by use of locally available cheap exhaust fan are implemented. Base on the results of user evaluation and result of another test, the technology to be disseminated is determined.

ii) Stakeholders and Target Group

Target group: Dried mango processors

Concerned parties: DGPER, Donor, Dried mango exporters, PTRAMAB

iii) Activities and Actors

Table 6.4.18 Activities and Actors of Project for Development and Dissemination of Technology for ATESTA Dryer Modification

Activity	Actors	Contents of Activity
1. Collecting the user evaluation on the modification technology tested in the pilot activity	Project PTRAMAB	Collecting the information of user evaluation (easy/difficulty to modify, usability, quality improvement, fuel reduction) from the 20 processors.
2. Testing another way of modification by use of locally available cheap exhaust fan	Project Exporters PTRAMAB	Making a modification by use of locally available exhaust fan (shown in Fig. C below) and test it to check gas consumption, drying temperature and drying time. Modification and test are conducted in two different facilities.
3. Exploring the sources of equipment/materials	Project	The project looks for exporter/manufactures of fan, plastic tray, thermometer in Europe, and estimates the cost of equipment and import transportation.
4. Determination of the technology to be disseminated	Project PTRAMAB Exporters Processors	Determining the technology to disseminate by analyzing the user evaluation, result of another way of modification, cost of importation from Europe and Japan. Put much weight on user evaluation.
5. Determination of the quantity of equipment	Project PTRAMAB	PTRAMAB prepares a list of facilities in which number of dryers, availability of electric power, and size of chamber are shown.
6. Importing the equipment	Project	The project imports the equipment.
7. Training on how to make modification, Distribution of the equipment	Project PTRAMAB	Preparing a manual for modification method, and conducting trainings. Distributing the imported equipment to the processors who received the training.
8. Modification of ATESTA dryers	Processors	Processors modify their ATESTA dryers.
9. Monitoring	Project PTRAMAB	Monitoring and instructing for modification. Monitoring the operation and effectiveness of modification in processing season.

Project = Donor + DGPER

It is assumed that there are about 400 units of ATESTA dryers in total. The number of dryers to introduce thermometer, fan and plastic trays is planned (assumed) as follows. Dried mango processors cover the 10% of equipment cost; excluding the import transportation costs.

- Total number of ATESTA dryers : 400 units
- Installation of digital thermometers: 380 units (400 minus 20 units; modified in the pilot)
- Installation of fan: 300 units (380 minus 80 units; lack stable power supply)
- Installation of plastic trays: 200 units (300 minus 100 units; chamber size does not match)

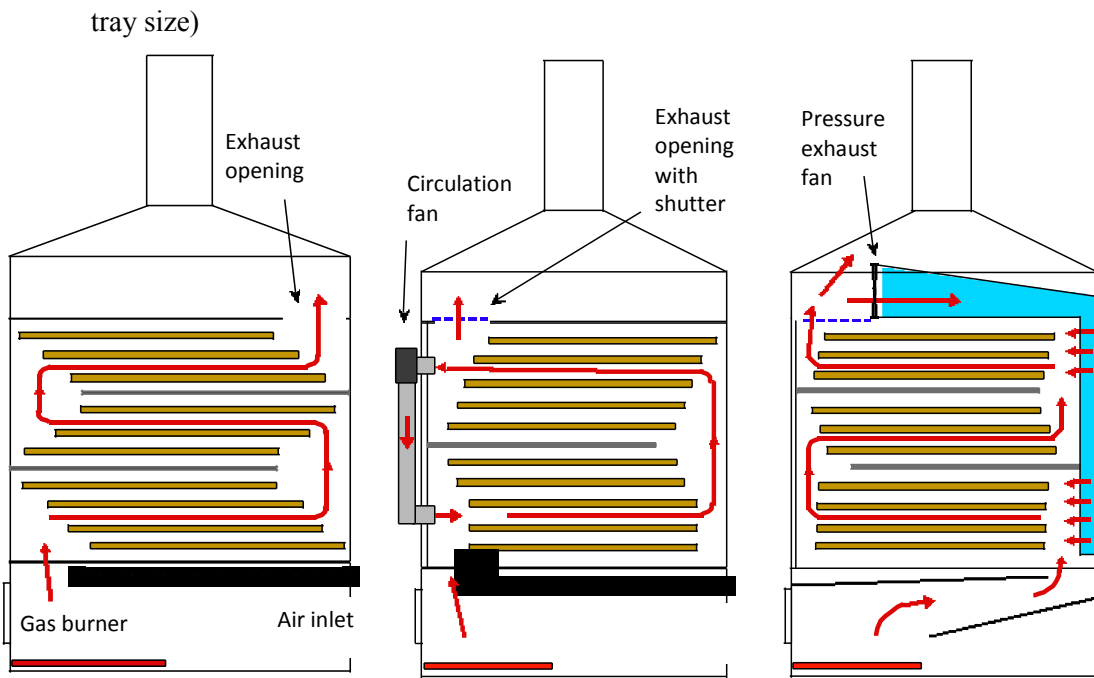


Fig. A: Ordinary ATESTA Dryer

Fig B: Modification Tested in the Pilot Activity

Fig. C: Another Way of Modification by Use of Locally Available Exhaust Fan; to be tested in this project

iv) Implementation Schedule

Table 6.4.19 Schedule of Project for Development and Dissemination of Technology for ATESTA Dryer Modification

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Collecting the user evaluation on the modification technology tested in the pilot activity	Project					
2. Testing another way of modification by use of locally available cheap exhaust fan	Project					
3. Exploring the sources of equipment/materials	Project					
4. Determination of the technology to be disseminated	Project PTRAMAB					
5. Determination of the quantity of equipment	Project PTRAMAB					
6. Importation of the equipment	Project					
7. Training on how to make modification, Distribution of the equipment	Project					
8. Modification of ATETSA dryers	Processors					
9. Monitoring	Project					

v) Expected Effectiveness

- ATESTA dryer modification technology is developed.
- 400 units of ATESTA dryers have thermometers; and temperature control is improved.
- 300 units of ATESTA dryers have thermometers and fans; gas consumption is reduced and product quality is improved.
- 200 units of ATESTA dryers have thermometers, fans and plastic trays; gas consumption is

reduced; product quality and food safety is improved.

3) Project for Introduction of Smaller Size Dryers

i) Background and Objective

It is necessary to increase the number of dryers/drying facilities to increase dried mango production although the production can be raised to a certain degree by raising operation rates of existing dryers.

It is not recommended to increase the number of ATESTA dryers since they have the problems mentioned previously. A dryer with force-air circulation, temperature control function and stainless/plastic trays should be introduced and promoted. The South African dryer introduced with support of PAFASP meets the conditions but it is too big for most of the processors.

This project aims at finding a small size dryer (equal to 1 - 2 units of ATESTA dryer) with force-air circulation, temperature control function and stainless/plastic trays which is suitable for medium-small scale processors and promoting its introduction by the processors, and then to increase the production of high quality dried mango.

It is assumed that there must be suitable dryers in India or Turkey. Looking for manufacturer/exporter of dryer in India and Turkey is not an easy work. Currently it is impossible for the processors/exporters to do it. Therefore, this project is planned as a donor support project. For the promotion of introducing new type of dryers, a financial support for processors is planned.

ii) Stakeholders and Target Group

Target group: Dried mango processors

Concerned parties: DGPER, Donor, Dried mango exporters, PTRAMAB

iii) Activities and Actors

(1) Selection of small-size dryer meeting the requirements

Table 6.4.20 Activities and Actors of Project for Introduction of Smaller Size Dryers (1)

Activity	Actors	Contents of Activity
1. Exploring the sources of dryers	Project	The project gathers information of dryers made in India and Turkey, and gets quotations from manufacturers/exporters.
2. Setting up a working group for testing and introducing new dryers	Project PTRAMAB	PTRAMAB and the project organize the working group.
3. Determination of dryers for testing	Project PTRAMAB	Working group selects two types (manufacturers) for testing.
4. Importation of dryers for testing	Project	The project imports the selected dryers.
5. Installing imported dryers and conducting test	Project PTRAMAB Processors	Working group selects two processors to take part in the test. Installing the imported dryers. Testing the imported dryers.
6. Determination of the dryer to be introduced	Project PTRAMAB	Work group evaluates the test results, and determines the dryer to be introduced.

Project = Donor + DGPER

(2) Introduction of the selected drier

Table 6.4.21 Activities and Actors of Project for Introduction of Smaller Size Dryers (2)

Activity	Actors	Contents of Activity
1. Selection of the beneficiaries	Project PTRAMAB	The project notifies the processors about the project's supports, condition, obligations, method of apply, etc. PTRAMAB receives applications and select the beneficiaries.
2. Importation of the dryers	Project	The project imports 30 units in 3 years (10 units/year).
3. Preparing for installation	Processors	Processors prepare the space, power supply, etc.
4. Installation of the dryers	Processors	Processors install the dryers. The project monitors and gives instructions for installation.
5. Operation and monitoring	Processors	Processors use the dryers. The project monitors the use.

Project = Donor + DGPER

iv) Implementation Schedule

Table 6.4.22 Schedule of Project for Introduction of Smaller Size Dryers

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Selection of small-size dryer meeting the requirements	Project PTRAMAB					
2. Introduction of the selected drier	Project PTRAMAB					

v) Expected Effectiveness

- The dryer meeting the requirements is found.
- 30 units of the dryers are imported and installed; 50 tons/year of high quality products are produced.

4) Financial Support for Dried Mango Processors and Exporters

As defined in the principle of planning previously, if it is judged that the issue can be solved with financial support only (i.e. no technical support is required), no project-type support is planned for such issue or such issue is included in project-type support. The following financial supports for dried mango processors and exporters are implemented to reduce their cost burden and then, to promote their challenges to work on the issues.

The financial supports are implemented by donors' funds and/or government budget. The plan merely indicates the amount of subsidy assistance per case and number of cases in 5 years, under the assumption that subsidy rate is 50%.

Table 6.4.23 Subsidy Assistance for Dried Mango Processors and Exporters

Intended Activity	Target Actor	Amount per case (FCFA)	Number of cases
1) Improvement of Hygiene : Support to attain the HACCP certification			
Obtaining the HACCP certification.	Processors who fulfill the EU regulation on the hygiene of foodstuffs.	1,500,000	5
2) Improvement of Product Quality and Profitability: Support to utilize the waste			
Development of processed food products by use of pulp around seed.	Processors who get a foreign partner /NGO support	2,500,000	3

Intended Activity	Target Actor	Amount per case (FCFA)	Number of cases
Making of biogas facility	Processors who received the SNV training on biogas	750,000	20
3) Enhancement of Production Capacity: Enhance the procurement of material mangoes			
Organizing producers into groups and obtaining the organic certification	Exporters	1,250,000	8
3) Enhancement of Production Capacity: Introduction of South African dryers			
Introduction of South African dryers	Processors whose current annual production is more than 15 tons, who can prepare the place and install dryer with his/her own resources.	12,500,000	5
4) Expansion of Sales Outlet: Acceleration of sales promotion by exporters			
Taking part in overseas trade fairs/exhibitions, preparing sales promotion tools	Exporters	1,500,000	20
Inviting overseas buyers	Exporters	1,000,000	10

Assumption: Subsidy rate is 50%

6.4.4 Implementation Structure and Project Cost of the Promotion Plan

(1) Implementation Structure

DGPER, the associations (APEMAB and PTRAMAB) and donors concern implementation of the promotion plan for mango. DGPER takes the leading part to hold stakeholders' meetings to share information and opinion to implement the project. CIR-SNV PROJECT is listed as a potential partner for implementation of a part of the plan.

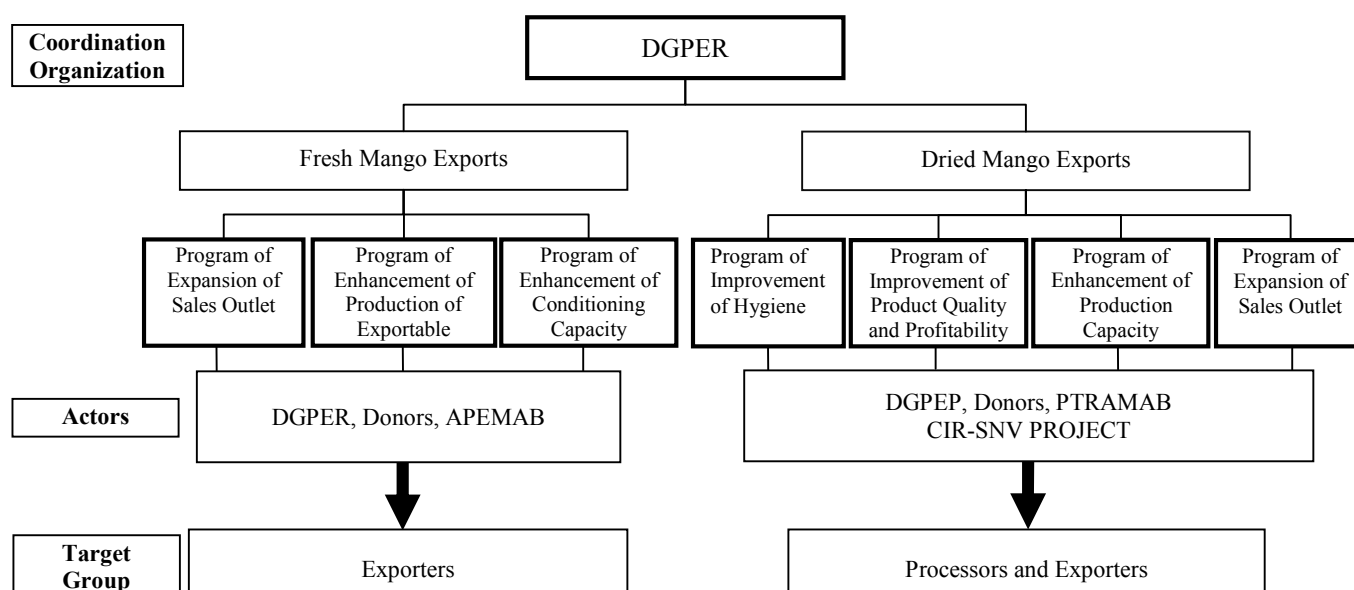


Fig. 6.4.2 Implementation Structure of the Promotion Plan for Mango

(2) Important Notices on the Implementation

1) Fresh Mango

- a) DGPER and donors are responsible for funding source, operation/management and technical advice in the implementation. APEMAB represents the exporters and is responsible for selection of individual beneficiary and implementation of some activities.

- b) Two project-type supportive measures are planned for the promotion of fresh mango exports. APEMAB is the target group in these projects. Considering the current situation of the association, simultaneous execution of these projects is not feasible. “Project for Acceleration of APEMAB’s Activities to Gather Export Marketing Information in order to Determine the Target Countries (1-year project)” is to begin first. And then “Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports (3-years project)” is to be implemented.
- c) The promotion plan aims to provide supports to the exporters, and no target area is set in the plan. However, it is necessary to involve DRARHASA of Cascades and Hauts-Bassins provinces where most of mangoes are produced in Burkina Faso.

2) Dried Mango

- a) DGPER and donors are responsible for funding source, operation/management and technical advice in the implementation. PATRAMAB represents the processors and is responsible for selection of individual beneficiary and implementation of some activities.
- b) Three project-type supportive measures are planned for the promotion of dried mango exports. Considering the current situation of the association, simultaneous execution of these projects is impossible. “Project for Introduction of Smaller Size Dryers is to be implemented after the 2nd year since it has lesser urgency.
- c) The measures for duty-free importation should be taken for equipment for ATESTA modification and small-size dryers. By doing so, pre-shipment inspection by COTECNA is also exempted.
- d) Two project-type supportive measures which including the activities of technological development / introduction; i.e.” Project for Development and Dissemination of Technology for ATESTA Dryer Modification” and “Project for Introduction of Smaller Size Dryers” should be implemented at the initiative of foreigner expert (donor).
- e) The promotion plan aims to provide supports to the processors and exporters, and no target area is set in the plan. However, it is necessary to involve DRARHASA of Cascades and Hauts-Bassins provinces where most of mangoes are produced in Burkina Faso.

(3) Project Cost

The project costs of the promotion plan for mango are shown in the table below.

Table 6.4.24 Estimated Project Cost of the Promotion Plan for Mango

[Unit: FCFA]

Project	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
Fresh Mango	11,300,000	50,200,000	59,200,000	46,900,000	9,000,000	176,600,000
1. Acceleration of APEMAB’s activities to gather export marketing information in order to determine the target countries	6,300,000					6,300,000
2. Acceleration of export promotion by APEMAB through establishment of contribution system on fresh mango exports		15,200,000	18,200,000	6,900,000		40,300,000

Project	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
3. Financial support for fresh mango exporters (Subsidy assistance)	5,000,000	35,000,000	41,000,000	40,000,000	9,000,000	130,000,000
Dried Mango	370,900,000	159,540,000	164,640,000	59,160,000	56,660,000	810,900,000
1. Improvement of hygiene to meet the EU regulation on the hygiene of foodstuffs	142,140,000	94,330,000	92,230,000			328,700,000
2. Development and dissemination of technology for ATESTA dryer modification	198,760,000	1,640,000				200,400,000
3. Introduction of smaller size dryers		33,570,000	42,410,000	31,660,000	31,660,000	139,300,000
4. Financial support for dried mango processors and exporters (Subsidy assistance)	30,000,000	30,000,000	30,000,000	27,500,000	25,000,000	142,500,000
Total	382,200,000	209,740,000	223,840,000	106,060,000	65,660,000	987,500,000

- Allowance and transportation fee of MARHASA officials and hired staffs are included. Their salaries are not included.

- Vehicle costs (procurement and operation) are not included.

- 50% is assumed for a subsidy rate. No costs of fund procurement and fund operation are included.

6.4.5 Conclusion

- (a) Promotion plan for mango aims the maintenance and expansion of exports of the regular export commodities (fresh mango and dried mango), and planned how to meet the market requirements, how to enhance the production systems, and how to promote the challenges of private sector.
- (b) In the promotion plan for fresh mango exports, the issues are defined as Expansion of sales outlet, Enhancement of production of exportable mangoes and Enhancement of conditioning capacity. The emphasis is laid on the acceleration of sales activities of exporters, thus, creation of funding source for the association activity is planned. In regard to the fruit-fly problem, new challenge to lead the “establishment of pest free areas”; one of the conditions for lifting of import ban of Burkina Faso mangoes due to fruit-fly is addressed.
- (c) In the promotion plan for dried mango exports, the issues are defined as Improvement of hygiene, Improvement of product quality and profitability, Enhancement of production capacity and Expansion of sales outlet. Hygiene improvement to meet the market requirements and improvement of ATESTA dryers (problem which kept untouched for a long time) are addressed and the projects are designed in detail. Interests of dried mango processors are high for these interventions.
- (d) The inputs/interventions (support for actors) are clearly categorized as technical support and/or financial support. In regard to the capacity development of actors, practical trainings on-site are planned. Strengthening of capacity of the associations through the implementation of activities is also planned.
- (e) Target groups of the promotion plan for mango are processors and exporters. Through financial support to them, increase of mango production by producers is supported. It means that involving the producers into export value chain is supported.
- (f) Thus, the plan defines the issues derived from the current situation and plans the feasible projects reflecting the results and lessons learnt from the pilot activity. It is concluded that the increase of exports of target commodities can be achieved by implementing the plan, and as a result, increase of exports benefit for mango producers.

ADDITIONAL DATA

1. The First 20 Producing Countries of the World in 2011

Row	Country	Production (Int \$1,000)	Flag	Production (Tons)	Flag
1	India	9,100,148	*	15,188,000	
2	China	2,707,863	*	4,519,380	F
3	Continental China	2,606,376	*	4,350,000	F
4	Thailand	1,557,834	*	2,600,000	F
5	Indonesia	1,276,908	*	2,131,139	
6	Pakistan	1,131,496	*	1,888,449	
7	Mexico	1,094,866	*	1,827,314	
8	Brazil	748,671	*	1,249,521	
9	Bangladesh	532,764	*	889,176	
10	Nigeria	509,291	*	850,000	F
11	Philippines	479,663	*	800,551	
12	Vietnam	411,410	*	686,637	
13	Kenya	381,420	*	636,585	
14	Egypt	358,352	*	598,084	
15	Yemen	226,283	*	377,664	
16	Peru	212,962	*	355,431	
17	United Republic of Tanzania	197,725	*	330,000	F
18	Madagascar	180,094	*	300,574	Im
19	Democratic republic of Congo	157,691	*	263,185	Im
20	Colombia	132,424	*	221,015	

*: Abstract figures, []: official data, F: estimate of FAO, Im: data of FAO based on the methodology of charge
Source: FAOSTAT

2. The First 6 Exporting Countries

Country	Tons
Mexico	273,122
Thailand	152,285
Brazil	140,910
Peru	124,048
Pakistan	105,130
India	63,441

Source: COMTRADE (Fruitrop 209)

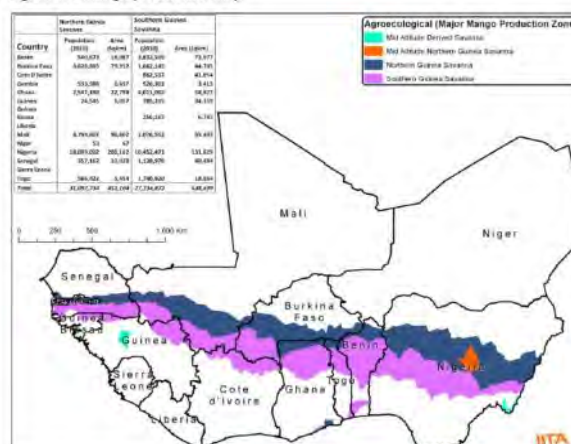
3. The First 6 Importing Countries of Mangos

Country	Tons
The United States	379,803
China	203,184
Netherlands	156,277
Saudi Arabia	63,497
Germany	57,798
United Kingdom	50,143

Source: National customs, COMTRADE (Fruitrop 209)

4. Production Zones of Mangos of the Countries of West Africa

Figure 16- Mango production map



5. Production of mango in West Africa (2011)

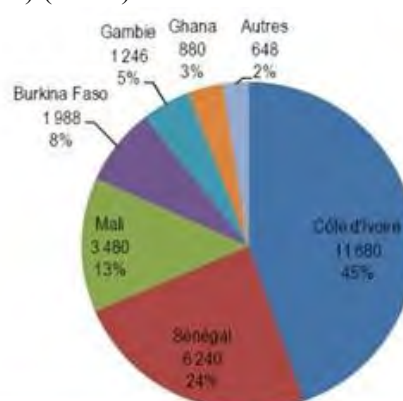
Country	Tons	Flag
Benin	13,900	F
Burkina Faso	13,154	Im
Cap Verde	6,800	F
Cote d'Ivoire	46,960	
Gambia	1,300	F
Ghana	85,000	
Guinea	157,700	*
Guinea-Bissau	8,057	Im
Mali	50,000	F
Niger	169,179	Im
Nigeria	850,000	F
Senegal	120,000	
Sierra Leone	21,972	Im

*: Abstract figures, []: official data, F: estimate of FAO, Im: data of FAO based on the methodology of charge
Source: FAOSTAT

6. Export of Mangos by the World towards the Countries of the EU (2009) (ton %)

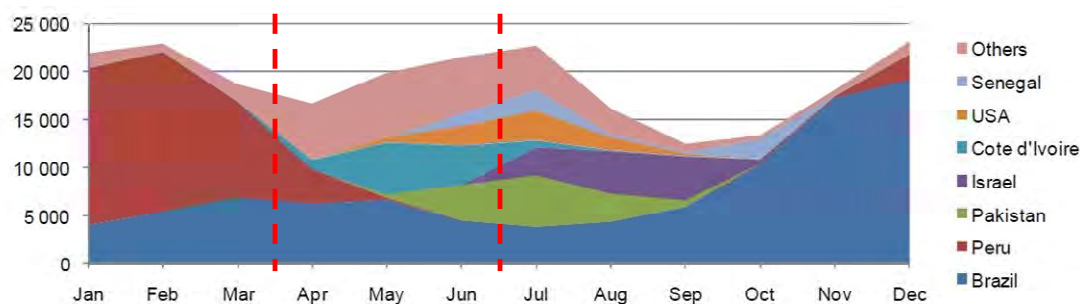


7. Export of Mangos of the Countries of West Africa towards the Countries of the EU (2009) (ton %)



8. Seasonal Variation of Import of Mangos of the Countries of the EU

EU Import Seasonality (January to December 2008, in metric tonnes)



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Chapter 7 Model for Sub-regional Market: Strawberry

7.1 Analysis of Present Situation

7.1.1 Target Market

Burkina Faso is the only country of exporting strawberries among West African countries¹. Strawberries are cultivated mainly in the suburbs of Ouagadougou and it is one of the special products of the country. The main markets of Burkina strawberries are sub-regional and domestic. Strawberries are luxury products as expensive fruit. It is difficult to keep freshness. The market demand of strawberries is limited for these reasons. However, economic growth of sub-regional countries including Burkina Faso changes the demand of people. It will raise the strawberry demand.

(1) Fresh Strawberry

1) Domestic Market

Strawberry markets in Burkina Faso are only Ouagadougou and Bobo-Dioulasso. In Ouagadougou, the main consumer of strawberries is wealthy class people including foreigner, hotel, restaurant and pastry.

The harvest season of strawberries is from January to April. It had been able to harvest in December. However, the harvest has been delayed in recent years. The producer price of first harvested strawberries was 3,500 FCFA/kg in early January 2014. At the beginning season, the price is high due to large fruits size and low yield. The price was gradually come down. In the end of January 2014, the price was 2,000 to 2,500 FCFA/kg. The price had been continued to down in February to March and fruits size becomes small. The price in March was 1,000 FCFA/kg. Then, the end of harvest season, the fruits became even smaller and the price fell to 750 to 1,000 FCFA/kg.

The consumer in Bobo-Dioulasso is also wealthy class people. The market scale of Bobo-Dioulasso is small and only two female merchants have sold the strawberries during harvest season. The producers price in beginning season is 2,000 FCFA/kg and it come down in February to March. In April, the price becomes 750 FCFA/kg that is the lowest price of strawberries.

2) Sub-regional Market

The price of strawberries came down according to the saturated strawberries in the domestic market at peak harvest season. Thus, much of strawberry could not sell to domestic market. Some producers and female merchants exported strawberries to sub-regional markets such as Côte d'Ivoire (Abidjan), Togo (Lomé) and Benin (Cotonou) by airplane. It was developed by producers self to increase the quantity of sell. The exportation has commenced from early January. The exported strawberries are sells at the local market. The supermarkets in Accra and Abidjan sell fresh strawberries imported from Europe. One of supermarket in Accra import fresh strawberries all year around. It can be said there is the demand of fresh strawberries. The market scale of sub-regional countries such as Côte d'Ivoire and Ghana is larger than domestic market. There can be selling with better price than Burkina Faso

The economy of sub-regional countries is still growing. It will take to increase the middle class people. Thus, the markets of Côte d'Ivoire, Ghana, Togo and Benin will have large demand and it will be target countries to export of Burkinabe strawberries. Especially, economic growth of Ghana is significantly and increase middle class people are also remarkable. It can be said that demand of strawberries from Ghana will be increased.

¹ Senegal is producing strawberries on a small scale but not exporting.



Burkina Strawberries sells at local market in Abidjan

16 fruits per pack

(2) Dried Strawberry

1) Sub-regional Market

Dried strawberries are processed from January to February sells to Lebanese trader as regular customer in Côte d’Ivoire. Dried strawberry is processed by order from customer. The processor bought 50 to 100kg of fresh strawberries at once in Boulmiougou. Total amount of processed for one season is 500kg of fresh. Dried strawberry sells 1,500 FCFA/100g at healthy foods shop in shopping mall of Abidjan as organic foods. The dried strawberry is sold only in this shop. Thus, the amount of demand, processed and sells are few.

7.1.2 Cultivation/Production

(1) Production Area

Strawberries are cultivated in four sites. On the suburban of Ouagadougou is Boulmiougou and Bika, the suburban of Bobo-Dioulasso is Koden and Kounima. Boulmiougou is most number of producers among four sites. Around the dam of Boulmiougou is an area of vegetable production suburb of city. The vegetable and strawberry cultivation in Boulmiougou has been commenced since late 1970s. The history of strawberry cultivation is; runner plants brought from France by French official who worked in Burkina Faso before 1970s. Then, one of gardeners of the French official had gotten the runner plants and he started cultivation. The cultivation expanded gradually to the present.

Strawberry producers also cultivate vegetable such as lettuce, celery and carrot. The cultivation area of vegetables by a producer is around 900m² and strawberries are around 200m². However, the cultivation area of strawberries is changed by every year due to a number of runner plants which propagate themselves. In case of lack the runner plant, the producer cultivated vegetable instead of strawberries.

All strawberry producers belong to the vegetable producers’ group. In the Boulmiougou, there are six groups of vegetable producers. The detail of each group is shown in the following table.

Table 7.1.1 Profile of Vegetable Producer Groups included Strawberry in Boulmiougou

Group	Members	Vegetable cultivation area (ha)	Strawberry cultivation area (ha)
Wend Manegda	55	3	0,5
Teega Wendé	65	4	0,75
Wend Songda	70	8	1
Nabons Wendé	120	12	1,5
Sougr Nooma	150	15	3,5

Group	Members	Vegetable cultivation area (ha)	Strawberry cultivation area (ha)
Feminine Group	35	2	0,25
Total	495	44	120

Source: Information provided by producers' groups

Bika is also cultivated vegetables such as lettuce, carrot and French beans. In Bika, the producers have formed association by advice from the city council of Ouagadougou. Since the organization can receive support from donors and government etc. The association has 173 members (2014). The area of strawberry cultivation is total 1.2ha and all members have cultured strawberry at small scale.

The producers use water for cultivation from dam and water well for vegetable cultivation. The water well for vegetable cultivation was installed by FAO. Strawberry plants using in Bika was given by Boulmiougou. The cultivation was commenced since 2007.

Kodeni is the suburban of Bobo-Dioulasso, the strawberry cultivation began since 30 years ago. The father of present producers commenced cultivation and it took over from them. Thus, the strawberry plants are old and it could not give enough number of runner plants by propagate themselves. The runner plants are decreased year after year. Some producers are forced to abandon strawberry cultivation by lost the runner plants. It was reason that number of producer is decreased. The 6 producers are cultivated strawberries in Kodeni (2015). They are also vegetables producers and they cultivate lettuce, French been and cabbage. In Kodeni, the vegetable producers organized non-official groups by 20 producers. They do not have approval from government and they could not receive the support from government and donors at present.

In the Kounima, 300 producers cultivated vegetables in the field. Most of producers in Kounima cultivated lettuce, French been and cabbage. In past, they organized producers' groups. However, the producers do not organized a group at this moment. The strawberry cultivation is relatively new in this area and it commenced 10 years ago. Some strawberry plant brought from Ouagadougou and it have been increased by propagate themselves. The long time propagation and attacked by diseases or insect, the runner plants have been weakened of propagate themselves. The disappeared runner plants were caused reduction in scale of strawberry cultivation. The strawberry producer in Kounima is only 3 producers (2015).





Volume de Production de Fraise par province







Fig. 7.1.1 Strawberry Production Volume per Province

(2) Cultivation Variety

The cultivated varieties in Boulmiougou are june-bearing variety of Oso grand, Camarosa and day-neutral variety of Selva. Most of cultivated variety is Selva. Oso grand and Camarosa are few remain. These varieties were introduced to Boulmiougou by French NGO in 1997. The strawberry plants of these varieties propagate themselves for cultivation since it introduced. Most popular cultivated varieties in Boulmiougou are Selva that is day neutral variety which developed in California. This variety gives large size fruits and high yield. Selva is most adapted variety of cultivation in Burkina Faso. However, the strawberry plant is deteriorated for long time propagation. It was caused weakness of propagation, reduction of yield and also genetic deterioration of deformed fruits.

Bika, Kodeni and Kounima have not information of cultivated varieties. It could not identify the cultivated varieties.

Table 7.1.2 Cultivated Varieties in Boulmiougou

Supplementary Information related to Varieties Characteristics of Strawberry Varieties introduced in Boulmiougou	
<p>Oso Grande</p> 	<p>Developed by: University of California Released: 1987 Pedigree: <i>Fragaria</i> × <i>ananassa</i> Duch Season: short day Fruit is firm Fruit size: average is large Fruit color and flavor tend to be variable Fruit shape: usually conic to wedge with a distinctively rounded tip Yield: large</p> <p><i>Note: The plant produces a good number of runners.</i></p>
<p>Selva</p> 	<p>Developed by: University of California Released: 1983 Pedigree: <i>Fragaria</i> × <i>ananassa</i> Season: day-neutral Fruit is firm Flavor: bland Fruit shape: varies from medium conic to flat and wedge. Fruit skin: deep red color Fruit size: very large Yield: large</p> <p><i>Note: It can produce ripe fruit within 30 days of planting.</i></p>
<p>Camarosa</p> 	<p>Developed by: University of California Released: 1992 Pedigree: Douglas x Cal 85.218-605 Season: early-season short day Fruit are very firm Fruit size: large Fruit skin: deep red color Flavor: high acidity, but they tend to vary in sweetness and flavor intensity Fruit shape: long wedge, very flat conic</p> <p><i>Note: This strawberry plant is productive and early production, has good appearance and has good flavor, and is widely adapted producing fruit over an extended period at low latitudes. It is excellent shelf life and good for fresh-market. Camarosa has relatively resistant to rain damage.</i></p>
<p>Seascape</p> 	<p>Developed by: University of California Released: 1991 Season: Day neutral Pedigree: Selva x Douglas Fruit size: large Fruit is firm Fruit shape: symmetric and medium to long conic Fruit color: deep red with glossy Yield: very large</p> <p><i>Note: Seascape is productive in good flavor varieties. It is very vulnerable to the mildew; ripe fruit is damaged easily by rain.</i></p>

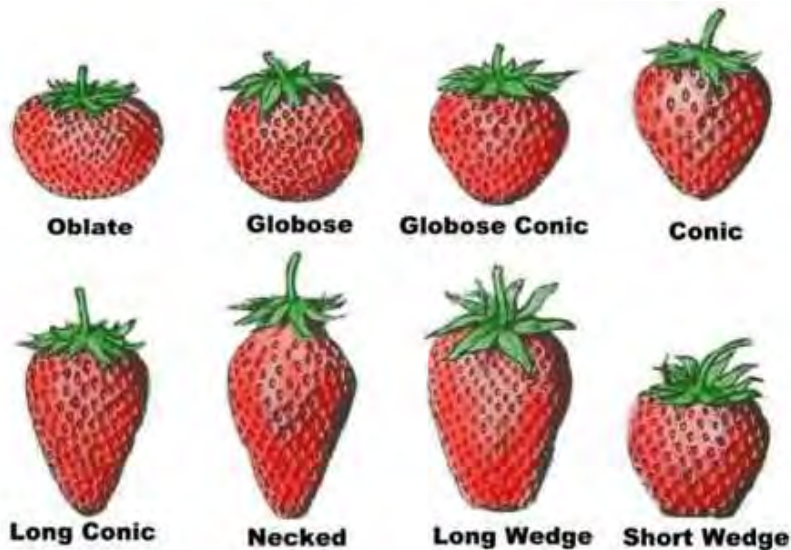


Fig. 7.1.2 Strawberry Shapes

Source: University of Florida <http://strawberry.ifas.ufl.edu/breeding/varieties.htm>
 University of California Agriculture and Natural Resources <http://www.ipm.ucdavis.edu/PMG/r734900111.html>

(3) Production of Runner Plants

After the harvest, the producers watering the strawberry plants in the field to propagated stolons. The stolons are formed from May to June. The stolons are produced runner plants. The stolons are formed 5 to 10 per plant. In Japan, first runner plant and divided the root of plant have not use for avoided the risk of diseases. In Burkina Faso, all of runner plants and divided the root of a plants are used for cultivation. The strawberry cultivation for 1ha is need 50,000 plants.

The problems of runner plants production are propagation is weaken and needed continuous watering to the nursery except rainy season. The watering is influence to production of runner plants. The area of production is decided by number of runner plants. The deteriorated runner plants cannot adapt the climate change, damaged attack by insects and diseases. Thus, it is caused the decrease of runner plant production.



(4) Cropping Type and Land Use

The area of cultivation field per producer is guessed about 200m². Strawberry is companion planting with other vegetables. Thus, it could not grasp certain area of cultivation.

Strawberry is cultivated around dam or water well for vegetable cultivation similar to vegetable

cultivation. During rainy season, the strawberry plants are gathered to the nursery for growth. When dry season is started, these are transplanted to the field.

In Boulmiougou, the field for strawberry cultivation is near the dam. The field is flooded area during rainy season. The producers cultivated cereals such as maize, millet and rice in this area. The nursery of strawberry is prepared bit far from field. This area is cultivated vegetables during rainy season.

In Bika, Kodeni, Kounima are cultivated vegetables in the field all year around. During rainy season, strawberry plants transplanted to the nursery for started seedling. In this time, the field is use for vegetable cultivation. In the end of rainy season from October to November after harvested of cereals and vegetables, the grown strawberry plants transplanted to the field and started to grow for harvest.

The strawberry develops 4 times flower stalks for one cycle. The primary flower stalks develops and opens in December. It will become fruits and harvest at the beginning of January. This is followed by secondary, tertiary and quaternary flower stalks develops and opens in sequence. The quaternary flower opens in March and it will harvest in the first of April. The fruits can harvest 20 to 25 days after opened the flowers.²

Activities	1	2	3	4	5	6	7	8	9	10	11	12
Plants preparation												
Transplanting												
Flowering												
Harvest												

Fig. 7.1.3 Strawberry Cultivation Calendar

(5) Production Quantity

The production quantity of strawberries could not collect certain quantity. It was caused that producers have not grasp their quantity and strawberries are out of target product of statistical information collection in Burkina Faso.

The quantity of production in Boulmiougou calculated based on the data collected by INERA³ and the volume of sales to domestic market and exportation by producers. It is approximately 30 to 40 tons in 2013 season. At the peak season of harvest, lots of fruits rot in the field. These quantity is not included the volume of sales. Thus, the actual production quantity can guess more than 30 to 40 tons.



² Strawberry flower opens and the fruit are 350 to 400 degrees Celsius. In the high temperatures, the maturing term are short and weight of fruits
³ According to INERA information (2005), strawberry yield in Boulmiougou was 4 to 5 tons/ha.

(6) Problems of Cultivation

The producers use runner plants for cultivation every year. It was propagated by themselves since long time ago. The strawberry plants are deteriorated by repeated propagation. The formation of stolons and runner plant is decreases and many of runner plants are dead for received attack by insects. In case of insufficiency the runner plants for cultivation, the producers use the plants that were divided of plants instead of runner plants. It is better to change the plants to new one. The new strawberry plants have to import from France or Spain through the nursery company. The price of a strawberry plant is 250 to 300 FCFA. It is expensive price for producers and they hesitated to change the new plants.

Strawberries are not targeted agricultural product for study of INERA. The producers have not received any support of cultivation technique from INERA. The yield of strawberries to be decreased as raise the temperature. In Burkina Faso, the temperature in December influence to yield. The temperature of December is high, the yield of strawberry to be poor. The highest temperature in Burkina Faso is March and April. The fruit become small size and yield to be low.

The strawberry plants need watering not only harvest period but all around year. The cultivation field far from dam is use the water well for vegetable cultivation. There is difficult to ensure the water for cultivation after February.

7.1.3 Post-harvest and Processing

(1) Post-harvest

The harvest of strawberries for domestic market is by order from sellers. It is not consider the post-harvest that simply harvested.

Strawberries sell in domestic market by the street stalls or street vendors. They are not had a way for keep freshness such as refrigerated shelf. Sometimes, they sprinkle water for keep freshness of strawberries as well as leaf vegetables.

Strawberries are export to sub-regional markets by airplane. The strawberries for exportation are packed directly to cardboard box of French beans exportation. In the developed countries, the fruits are packed in the plastic pack for selling. However, it is not available in Burkina Faso.

Intermediate (Group Purchasing Organization) in Abidjan have the cold room. They stored the product in cold room before sale to the store.



Harvesting (Boulmiougou)

Street stall of strawberries (Bobo-Dioulasso)

Strawberries packed for export

(2) Processing

Strawberries processing is not common in Burkina Faso. The processed product is only dried strawberry that only produced by Rose Eclat. Rose Eclat is mainly produced dried mangoes by ATESTA dryer. They are also dried papayas, pineapples, tomatoes and strawberries by same dryer.

The processing of dried strawberries is washed and removes the calyx then dried whole. The dried strawberries are too tough and the visual of product is not attractive. It was caused by the method of manufacturing.



7.1.4 Value Chain

(1) Trade Chain

The trade chain of fresh strawberries and works of each actor are shown in the figure below. The structure is simple. The characteristic of fresh strawberries chain are indicated as below.

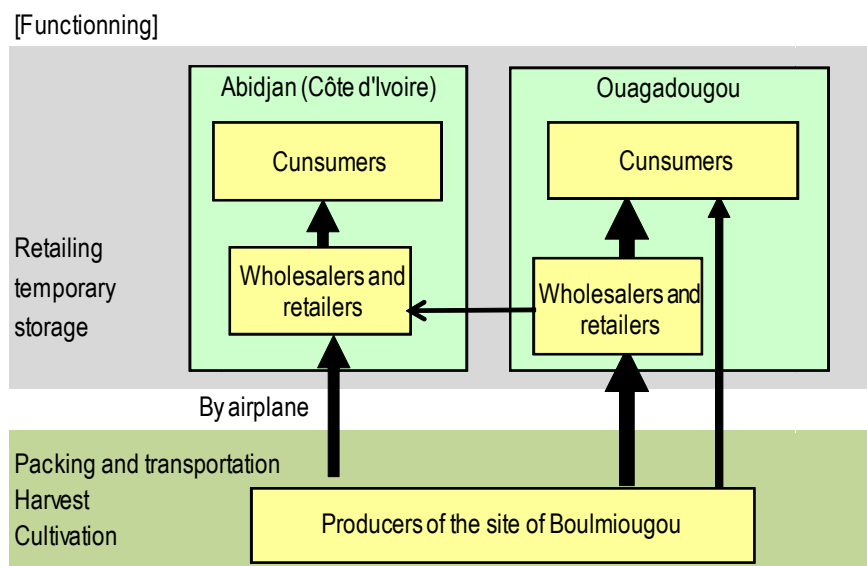


Fig. 7.1.4 Trade Chain of Strawberry in Ouagadougou

1) Sale to Ouagadougou

- The female merchants are bought strawberries in the field to sale in Ouagadougou. During peak harvest season, about 30 merchants come to buy strawberries at the field.
- 80% of female merchants are wholesaler, 20% are wholesale and retail (INERA, 2005).
- Some part of producer, their family bought strawberries and it resale to buyers in Ouagadougou. The proportion of sellers to Ouagadougou is 85% of wholesalers and retailers and 15% of producers.
- In generally, the producers sell to female merchants individually. Each producer has some regular female merchants. Individual producer can sales maximum about 50kg per day. The producers' group sells strawberry to merchants in case of large demand that impossible to sale by individual.

-
- e) A female merchant have 3 to 4 producers as business partner.
 - f) The female merchants sell strawberries in front of supermarket for wealthy class. Some female merchants sell to the hotels and restaurants. The buyers of the hotels and restaurants come to buy strawberries to the street stall.
 - g) The quantity of sales to Ouagadougou from Boulmiougou in 2013 season, it guessed approximately 20 tons based on the interview of producers.

2) Sale to Abidjan, Accra and Lomé

- a) Some producer export to Abidjan and Lomé for regular customer by airplane. These markets are developed by themselves. They negotiate by telephone.
- b) Both individual producer and producer's group exports to sub-regional countries by airplane. Some female merchant who sale strawberries in Ouagadougou have customers in Abidjan and Lomé. They bought strawberries in Boulmiougou on the basis of customer demand. Then export to sub-regional markets by airplane.
- c) The packing material for exportation is cardboard box of French beans (without lid, 4kg/box, for exportation). The passenger plane of Air Burkina use as transport for exportation. The producers arrange the transportation by telephone. The charge of transportation is 350 FCFA per kg (2014). The transportation from field to airport is by taxi. The charge of taxi is 3,000 FCFA (2014). The taxi can transport 200 to 300kg in once.
- d) Strawberries harvesting in early morning or night in cool time zone. The harvest time is considers the flight schedule. The fruits pack in cardboard box immediately after harvest.
- e) Due to use passenger plane for exportation, the strawberries are carried as luggage of passenger. The room temperature of luggage is normal temperature during flight.
- f) Sanle Export is company based in Banfora and Bobo-Dioulasso. They export fruits and vegetables to Côte d'Ivoire. In beginning of 2013 strawberry season, Sanle Export received orders of strawberry 200 to 300kg per week from supermarket. However, Sanle Export could not arrange the stable supply system. This business could not agree.
- g) In Côte d'Ivoire, while the merchandise sell to supermarkets have to through Lebanese intermediate (Group Purchasing Organization).
- h) According to the record of producer's group, the group export to Abidjan and Lomé in 2013 season is 22 times per each. The quantity of exportation is 200 to 300kg per time. The individual producer export strawberries for several time. However, the quantity of exportation by individual producer is unknown. The total quantity of exportation is guessed approximately 15 tons.
- i) In local market in Abidjan, merchants sell Burkinabe strawberries from January to April. The 16 fruits of middle or small size (about 150 to 200g) are packed in the plastic pack and sold 1,000 FCFA per pack. The price is fixed while strawberry season. The fruits are packed in the plastic pack and placed on the table. The plastic pack is covered with wet a jute bag. The customers buy strawberries for make a juice or cake.
- j) Jour de Marche Plate is supermarket in Abidjan used to sell Burkinabe strawberries. The quality of strawberries arrived at Abidjan were crushed. It caused that supermarket decided to quit to sale.

(2) Production Cost of Strawberry

The production cost of strawberries per 1kg is depends on destination. It is caused cost of packing material and transportation. The sale price for exportation is added 500 FCFA/kg to the sale price in domestic market at the end of January 2014. The profit of domestic and sub-regional markets is same. The sale price of domestic markets declines from February to April. The sale price for exportation is

same through season. Thus, in this period, the exportation can gain more profit.

84% of producers in Boulmiougou are not in possession of land. The contract of land use between a land owner and a producer is not entered. The producers pay 5% of total sales to land owners as usual. The total amount of payment from producers is 2,000,000 FCFA in 2013 season. The case of production cost of strawberry is shown in the table below.

Table 7.1.3 Case of Production Cost of Strawberry (per kg)

Item	Abidjan Market (by airplane)		Domestic Market	
	FCFA	%	FCFA	%
Production cost for 1 kg	711.1	100%	196.1	100%
(1) Fertilizer				
- Organic fertilizer	4.5	0.6	4.5	2.3
- NPK	7.6	1.1	7.6	3.9
- Urea	3.8	0.5	3.8	1.9
(2) Pesticides	0.3	0.0	0.3	0.0
(3) Fuel	20	2.8	20	10.1
(4) Straw	8.0	1.1	8.0	4.1
(5) Labor	84	11.8	84	42.8
(6) Land	68.0	9.6	68.0	34.7
(7) Packing Material	150.0	21.1	-	-
(8) Transportation				
- Taxi	15.0	2.1	-	-
- Airplane	350.0	49.2	-	-
Sales per kg	2,500		2,000	
Gross profit per kg	1,788.9		1,803.9	

Source: interview to producers

(3) Sales Price of Imported Strawberry in Abidjan and Accra

In Abidjan and Accra, there are lots of foreign-affiliated supermarkets for wealthy class. Sales prices of imported fresh strawberry in Abidjan and Accra were surveyed in November 2013. It is shown in the table below.

Table 7.1.4 Sale Price of Imported Strawberry in Supermarket (per kg)

	Country, Retail Price (Conversion to FCFA/kg)	Packing Form	Import Destination
Abidjan	Morocco: 9,000 France: 18,000 - 27,000	Plastic pack with cover. 500g of plastic bag or pack, 1kg of wooden frame box etc.	Imported from Morocco, France, South Africa, etc. The import destination changed by season.
Accra	Holland: 10,500	10 to 15 fruits (about 200g) packed a plastic pack without cover	Imported from Holland, France, Belgium, etc. The import destination changed by season. Imported once a week all year around

Source: Sub-regional market survey (November 2013)

(4) Value Chain of Strawberry Exported to Abidjan (Supermarket)

Value chain of retail sales of Burkinabe strawberries exported to Abidjan is shown in the table below. It was estimated based on the price of strawberry exported to Abidjan by Burkinabe exporter from end of January to early February 2014. At the same period, imported strawberries from Spain sold from 14,000 to 15,000 FCFA/kg. Burkinabe strawberries can be sold at higher price than present price due

to change the package and keep freshness.

Table 7.1.5 Case of Value Chain of Strawberry Exported to Abidjan (Supermarket)

	Sale Price (FCFA/kg)	Amount of Value Added (FCFA/kg)	Rate of Value Added in Retail Prices
Retail price in Abidjan (Burkinabe strawberry)	5,900	1,400	23.7 %
Abidjan importer	4,500	1,000	16.9 %
Burkinabe exporter	3,500	1,000	16.9 %
Burkinabe producer	2,500		

Source: data calculated based on the information collected from stakeholders and field survey (end of January 2014)

7.1.5 Formulation of Organizations in the Value Chain

The organization of strawberry in national level and regional level are not formulated. The producers in Boulmiougou formed 6 groups and these groups formed a union. The producers in Bika formed an association supported from city council of Ouagadougou. The producers in the suburban of Bobo-Dioulasso are not formed any group. The producer's group and association are formed for vegetable cultivation. The strawberry cultivation is a one of activities of vegetable cultivation. The main actors of strawberry sales to domestic markets are the female merchants who sell strawberries on street stalls or street vendors. The female merchants formed an organization.

Therefore, the main actor of strawberry exportation to sub-regional markets is a producer's group, individual producers and female merchants. Basically, trade for local markets in the sub-regional market is made between individual producers and buyers, as same as it for domestic market.

7.1.6 Support Projects by Other Donors

The support project for strawberry is only French NGO was supplied new strawberry plants in 1997.

7.1.7 Activities of the Government Organizations

(1) INERA

Almost all of government organizations are not have activities and supports for strawberry cultivation. Only the INERA was targeted to Boulmiougou that supply of vegetables for citizen. The INERA surveyed for social economic and cultivation as agronomy. INERA also surveyed soil investigation for sensitize the effective utilization of pesticides for environmental protection.

7.2 Promotion Issues and Measures

Based on the present situation mentioned above, issues and measures for market oriented strawberry promotion mainly target to the supermarkets of wealthy class in sub-regional and domestic markets are analyzed and considered.

7.2.1 Promotion Issues

The demands for the domestic markets are limited. Since strawberries are luxury product, the consumers are foreigners or wealthy class people. In Burkina Faso, only Ouagadougou and Bobo-Dioulasso markets have demands. During peak harvest season, the domestic markets are full of strawberries. At the same time, the price is declined to half price. It is caused that all of producers cultivates in same calendar.

The fruit film of strawberry is thin and the fruits are easily bruised. In addition, the fruits to be ripen after the harvest. Strawberries are difficult to store at room temperature. If the ripened strawberries could not sell, it has no other choice to throw away.

In sub-regional countries, strawberries are not cultivated. It can be said that strawberries will be a special product of Burkina Faso. The support for strawberry cultivation is needed immediately for preserves its advantage in the sub-regional market.

Based on the situation, the promotion issues in the strawberry promotion are the followings.

(1) Limited Market

Burkinabe strawberries are sold around supermarkets in the domestic market. Some producers export to sub-regional countries by airplane. The exported strawberries are sold in the local markets. The orders from local markets are irregular and the demands are uncertain quantity. Burkinabe strawberries are sold at the local markets in both sub-regional and domestic. Strawberries are luxury products. It is expensive compared with other fruits. The main customers of strawberries are foreigners or wealthy class people and demands are limited. Increase of demand for the local markets of both sub-regional and domestic are not expected.

The merchants sell Burkinabe strawberries on street stalls or street vendors without neat package. In the supermarkets of Abidjan and Accra, the imported strawberries are packed with plastic packs. The price of imported strawberries in the supermarkets is expensive in comparison with that of strawberry in local markets in Burkina Faso. Needs for strawberries are confirmed in luxury market such as supermarket and the needs will increase with economic growth. If Burkinabe strawberries will enter such luxury market in the future, they will need to compete with strawberries imported from Europe. The neat package and selection of fruits by color, size and form of fruit are necessary for the competition with Europe strawberries.

The fruits film of strawberry is thin. Since the film of ripe fruits is especially soft, the fruits easily crushed by shock. In Burkina Faso, the producers harvest the fully ripe fruits. At the time of harvest, the producers pluck fruits and throw them into a bucket. This operation of harvest damages the fruits. The fruits continue to ripen even after the harvest. As time goes by, the fruits are more easily to damage and become to the loss.

In case of exportation to sub-regional markets, the fruits are packed in cardboard boxes of French beans and transported by passenger planes. The cardboard boxes of strawberries are carried as passenger luggage. The strawberries are transported under room temperature. Shock of transportation and temperature are gave negative impacts to keep freshness of the fruits. It causes loss of sales. Buyers indicated that proportion of loss was high. From now on, it is necessary to decrease loss that is caused by maturity of fruits in harvest, packing, transportation for prospecting for new markets in sub-regional market.

(2) Decline and Reduction of Strawberry Cultivation

Strawberry cultivation in Burkina Faso was begun from 30 years ago. The runner plants for cultivation is propagated themselves since commerce the cultivation. The areas of production are reduced caused of the runner plants production is decreased year after year. The quality of fruits is classified such as sweetness, color, form of fruits. The female merchants and customers are pointed out the sweetness of strawberries is in decline than before. It guessed that was caused deterioration of runner plants, temperature and cultivated varieties.

In the future, to increase the selling quantity in sub-regional and domestic market, it is necessary to stably produce and sell strawberries which quality is meeting needs for buyers. The quality of fruits has to improve to stable production. The introduction of new varieties can improved the plants and fruits. However, the runner plants of new varieties are not available to procure in Burkina Faso. That is necessary to import from Europe. The importation of new variety is difficult for producers. Even the selections of new varieties that can adapt to cultivation in Burkina Faso are difficult.

Moreover, the INERA and MARHASA not have technical information for strawberry. The cultivation technique of strawberry in Burkina Faso was established by producers based on their experience. The improvement of technique by producers is limited. Strawberry cultivation in Burkina Faso will be deteriorated without technical support from the INERA and MARHASA.

7.2.2 Promotion Measures

(1) Development New Markets

Strawberries can store only in quite short time. Thus, strawberries should be sells immediately after harvest. The unsold strawberries are no other choice to throw away. The cultivation in Burkina Faso is same calendar. It is impossible to sell all of harvested strawberries through present market channels. It is necessary to prospect for new markets and diversity market channels in both of sub-regional and domestic markets. The development of markets will increase the quantity of sales.

(1)-1 Sub-regional Market

Some producers and female merchants exported strawberries to the local market in the sub-regional countries. The scale of local market in sub-regional countries is small as well as Burkina Faso. The period and quantity of market demands is irregular. The consumers of strawberries are wealthy class people and foreigners in the sub-regional markets. According to the economic growth, Abidjan and Accra are increasing the population of wealthy class and foreigners. Hence, there are lots of foreign-affiliated supermarkets for wealthy class. Some of supermarkets import fresh strawberries from Europe and South Africa. The sub-regional markets have demands of fresh strawberries.

The measures for prospecting for new markets in the sub-regional countries are the followings.

1) Assistance for Prospecting for Markets and Grasping Needs for Destination of Export

In the future, it guessed that the demands of luxury products are increase due to economic growth. The sells promotion of strawberry is targeted to the supermarkets in Abidjan and Accra. Strawberries are luxury products and it is necessary to keep freshness. It is important to meet the needs of importers.

Prospecting for supermarkets is difficult by producers and it depends on the marketing of exporters. The government of Burkina Faso assists the activities of companies such as provision of information, provision of opportunities for negotiation and assistance in participating in the exhibition and marketing for new markets.

2) Commercialization with Added Value

As mentioned in the promotion issue, in case of Burkinabe strawberries will sell to the sub-regional markets will compete to imported strawberries from Europe. The quality of imported strawberries is good and it packed neat in plastic pack.

It is necessary that Burkinabe strawberries considers the selection of the high quality of fruits by color, form and packed in the plastic pack. The selection of high quality fruits and packaging can be added value and it sales higher price than present. The realization of these operations will be possible the Burkinabe strawberries are in competition with others.

3) Reduction of Loss

i) Improvement of Transportation

As mentioned in the promotion issue, the exportation to the sub-regional markets by airplane has much loss. In Europe, the cardboard box covered with wooden frames to protect the fruits from

shock. It is one of measure for loss reduction. Burkina Faso also considers the improvement of packing style.

In Burkina Faso, the many products are frequently exported by truck. Lots of agricultural products such as vegetables and fruits are exported by a refrigerated truck. The refrigerated truck can be carried to Abidjan or Accra under the low temperature. It can be realized that strawberries carried under the low temperature from field to arrival of destination. The utilization of refrigerated truck for exportation is better to be considered. The order of loading cardboard box for protection of fruits should be considered when using refrigerated truck for export.

ii) Improvement of Packing

In developed countries, strawberries are packed in plastic packs and they are placed in flat cardboard boxes for strawberries. This is the measure to protect fruits from damage. The utilization of plastic pack has to be considered for loss reduction. In Abidjan, the packing in plastic pack is an essential condition of sale to supermarkets.

However, the plastic pack is not available to procure in Burkina Faso. It is needed to import from the producing countries such as Côte d'Ivoire and Ghana. The supermarkets in Abidjan have a regulation of condition of package for sale. The strawberries have to be packed in the plastic pack. The intermediate in Abidjan is provided package set by supermarkets to the producers. It should be considered the request of package provision to the buyers.

iii) Adjustment of Harvesting Period

The transportation to the sub-regional market spends much more time than the domestic market. Strawberries can be stored only in a quite short time. The fruits are being ripened even after the harvest. The period of the harvest has to be considered that the fruits to be ripened fully at time of sale. The harvest for exportation to the sub-regional markets is counted by the number of days that spend transportation. The harvesting period is decided to subtract counted days from day of ripening. The advantage of harvest before fully ripened is that the fruits' firmness is not as strong as fully ripened. It can resist the shock at the transport and reduce the loss.

The important thing of continuation of deal with supermarkets is to supply the unified quality of strawberries. The needs of quality are different by supermarket. The producers could not grasp all needs of them and it also could not decide the period of harvest. It is necessary to collaborate with exporters to control the quality.

In the future, the producers need to be able to consider the period of harvest by the standard of coloration of fruits. It is set up by the producers based on the needs of consumers. It can supply a large quantity of the unified maturity of fruits despite of production places and producers.

iv) Improvement of Harvesting

The practice operation of harvest, the producer plucks fruits and throws it to the tub or bucket. The fruit is damaged by operation of harvest. The damage of fruits at the harvest period is to be cause of loss.

The producers need to gain the knowledge what the cause of damage and take a measure for improve the quality of strawberries. The measure for protection of the fruits from shock is usage of the material as cushion

The most important thing of improvement of harvesting is protection of the fruits from damage. It is not necessary the special technique for protection. The materials as cushion are put under the tub or bucket. The materials are available to procure in Burkina Faso. The improvement of

harvest can be expected the effect by little modification of operation. The producers are better to understand the operation of harvest that is not to give the damage to the fruits.

(1)-2 Domestic Market

Strawberry markets in the domestic market are already established. At the peak season of harvest, strawberries are full of local markets in Burkina Faso. From now on, the local markets could not expect the increase of demands. It is better to consider the added value and discrimination from local market to other markets.

1) Commercialization with Added Value

Strawberries sell to the domestic market occupied 80% by the female merchants. The female merchants in Ouagadougou do not have a way for keeping freshness of strawberries as well as vegetables. Unsold strawberries will be a loss at the evening, the female merchants sell at a discount price for all of them. Thus, the strawberry price in the local market is different between the morning and evening.

The supermarkets do not sell the vegetables and strawberries produced in Burkina Faso. In the past, the producers had sold strawberries to the hotels and restaurants. Strawberry sales in the local market are established by female merchants. The female merchants sell strawberries and they sell at a low price in the evening. The difference in selling price between producers and female merchants became a problem. According to the problems, the producers could not continue to sell to the hotels and restaurants. It is necessary to consider a new way of sales to increase sales in the domestic market without conflict with female merchants. The new way is supposed to be commercialization with added value.

The main consumers of strawberries are supermarket users such as foreigners and wealthy people. The supermarket does not sell the agricultural product of Burkina Faso. However, it is guessed that agricultural products of Burkina Faso have demand by supermarket users. Therefore, the distinction of sales in the local market such as added value that to be realized the sale to the supermarket.

The commercialization with added value of strawberry is to select the high quality as color and form and packed in plastic pack for well visual. Some of the supermarket is sold organic vegetable of Burkina Faso, it can reference the way of added value.

(2) Preservation and Expansion of Cultivation

Strawberry cultivation in Burkina Faso is declined production and propagation of runner plant caused by deterioration of plant. Strawberry is necessary to be stable production as special product of Burkina Faso. The information and knowledge of strawberry cultivation are not gathered. The producer is never received support of strawberry cultivation. It is necessary that the INERA and MARHASA gather the knowledge and give the support of cultivation to the producer.

The measures for preservation and expansion of cultivation are the followings.

1) Selection and Introduction the Adaptable Variety

The improvement of the deterioration of runner and to realize stable production is only exchange the runner plants import from Europe. The introduction of new runner plants is an urgent issue. It is necessary the support of purchase new runner plant. The introduction of new runner plant has to select the varieties that can adapt the cultivation environment in Burkina Faso.

Lots of strawberry varieties that cultivate in Burkina Faso are unknown. Only Boulmiougou is known the cultivated variety that is Selva. The introduction of new variety have to consider and selection the characteristic of variety such as succession of Selva, cultivable under high temperature,

excellence storage and transport that developed in United State or Europe.

2) Introduction of the Forcing Culture

The cultivation calendar in Burkina Faso is same among all producers. At the peak season of harvest, the domestic market is full of strawberry. Strawberry that could not sell will be rejected. Although some quantity of strawberry exported to the sub-regional market, it could not export all harvested strawberry. The measure of alleviate the full of strawberry in peak season is to introduce the other cultivation calendar to shift the harvesting period.

The present harvesting period is from January to April. In April, the temperature is high and the water for cultivation is not enough. The prolongation of harvest season is difficult for these problems. It is better to consider the advance of harvesting period as forcing culture. The technique of control of carbon and nitrogen and prune the roots are possible to advance the flower bud differentiation. It is not only advanced the period of flowering and harvesting but also can be changed the single calendar of cultivation. The several calendar of cultivation can be alleviated the full of strawberry in the market of peak harvest season.

3) Strengthen the Secondly Production Area

Strawberry in the domestic market is full at the peak harvest season. Strawberry is export to the sub-regional countries but that is only for local market. Hence, demand of exportation is limited. The expansion of production area should not be done in short term for the limited market.

In Bobo-Dioulasso, the producers cultivate strawberry in the small scale. In the future, it can be guessed that strawberry will be exported to the luxury product market in the sub-regional counties by refrigerated truck. Bobo-Dioulasso is nearby Abidjan and Accra than Ouagadougou, strawberry demand of Bobo-Dioulasso have possibility of increase for expansion the exportation.

However, strawberry producer in Bobo-Dioulasso is decreased by disappeared of runner plants. The number of producer in 2014 is a few. Ouagadougou has a problem that the plant could not well propagate and plats are not enough for cultivation. These problems caused that strawberry cultivation will be declined.

Strawberry is the crop that is propagated themselves. This type of crop is difficult to increase the quantity of production in short term. The promotion for exportation is possibility of increase the quantity of sell. It can be assumed the quantity of exportation from Bobo-Dioulasso will increase. It is better to take a measure to preservation of strawberry cultivation in Bobo-Dioulasso for stable cultivation.

7.3 Pilot Activity for Sales Promotion of Strawberries

PAPAOM participated in the 4th forum of “Investir en Côte d’Ivoire” (ICI 2014) in Abidjan as a pre-pilot activity. During this period, strawberries are produced in Burkina Faso, and fresh strawberries have been presented among other products. The pilot activity has been implemented based on the results obtained in this pre-pilot activity.

7.3.1 Pre-pilot Activity

(1) Background and Objective

The strawberry is one the specialties of Burkina Faso. Even though it is possible to look for new buyers in urban areas of the sub-region, such as Abidjan and Accra for Burkinabe strawberries, producers have difficulties in obtaining them without being supported. In this context, activities have been implemented as a part of the pilot activity, in order to promote Burkinabe strawberries and their commercialization during ICI 2014, which has been organized between January 27th and February 2nd

in Abidjan, as strawberries are produced during this period. Part of the pilot activity concerning the promotion of strawberry commercialization has been implemented through the participation in this forum.

Though the participation of Burkinabe companies commercializing agricultural products during this forum, these pre-pilot activity objectives were to find new buyer and to form a commercialization network. Therefore, DGPER counterparts' participation and the experience in supporting private companies were objectives of the activity.

(2) Pre-pilot Activities Associated with Pilot Activities

The relationship between the pilot activity proposition and the pre-pilot activity is detailed this below. The pre-pilot activity has been implemented in order to promote the commercialization through the participation to ICI 2014.

Table 7.3.1 Relationship between Pilot Activity and Pre-pilot Activity

Pilot Activity	Pre-pilot Activity
1. Preliminary explanation	1. Preliminary explanation
2. Preparation of samples	2. Preparation of samples
3. Trial of product transportation with a refrigerated truck	3. Trial of product transportation with a refrigerated truck
4. Conditioning trial (utilization of plastic packs) and commercialization trial	4. Conditioning trial (utilization of plastic packs) and commercialization trial
5. Promotion activities for commercialization	5. Promotion activities for commercialization
6. Procurement of new runner plants	—
7. Trial of accelerated culture techniques	—
8. Growth monitoring	—

(3) Implementation Areas and Related Persons Target Groups

ICI has been organized for the first time in 1991. Its 3rd edition has been organized in 1999, but is has not been organized since then, with the impact of political and economical crisis. The organization of the 4th ICI was included as a priority action in the National Development Plan (2012-2015) and the State was therefore responsible of its preparation and implementation. ICI 2014 has been organized between January 27th and February 2nd, with the participation of about 200 exhibitors and more the 4,000 participants from 113 different countries.

The 3 participating companies presented their products and proposed tastings on the booth prepared for the pre-pilot activity, while promoting their activities. Moreover, 2 counterparts of the DGPER have also participated to the exhibition and have observed the commercialization methods of the participating companies as well as those of other countries' companies.

Sanle Export, Rose Eclat and ESOP Pô participation to ICI 2014 has supported by PAPAOM, and the participants have been selected according to the DGPER selection methodology. Among the 3 companies selected, Sanle Export, which is an exporter, commercializes fresh vegetables to a central purchasing service which supplies supermarkets in Abidjan. Moreover, Rose Eclat commercializes dried strawberries to hotels in Abidjan. These companies are also transforming and exporting other products, which have been presented on the booth.

(4) Contents of the Trial Cultivation and the Results

1) Samples

i) Details

- a) Fresh and dried strawberry samples have been presented during ICI 2014 and the visitors'

impressions have been collected.

- b) Until now, fresh strawberries were only supplied to local markets, but in order to target high end markets, including supermarkets, strawberries have been conditioned and presented. This method has been compared with the conditioning material used until now.
- c) Dried strawberries were produced and exported only on command, with very low volumes. However, dried strawberries are the only strawberry transformed product, and they were already exported to Abidjan. Samples have been produced in order to sensitize people to dried strawberries more largely. Their opinions have been collected.

ii) Results

- a) By bringing samples, it has been possible to make Burkinabe strawberries known largely. Foreigner (from Europe) who came on the booth have not observed important differences in terms of quality compared to European strawberries. An Ivorian wholesaler wishes to import strawberries to sell them in Côte d'Ivoire.
- b) Concerning dried strawberries, there were not known before ICI 2014, and it was possible to promote them. However, because of their aspect and of their hardness, it was not possible to conclude contracts.

2) Plastic Pack Conditioning Trial

i) Details

- a) When Boulmiougou producers export strawberries by airplane, they directly condition them in French bean cardboards, with 4kg conditioned by cardboard. Strawberries are a weak product which is easily damaged. With this type of conditioning, necessary measures to protect the strawberries from damages during transportation have not been taken. The objective being to commercialize the strawberries on the high end markets, through the supermarkets, it is necessary to improve the fruit quality. In order to reduce the damages received by strawberries during transportation and preserve their quality, samples have been conditioned in plastic packs and sent by truck, to confirm the damages and confirm the buyers' opinions.
- b) The samples were plastic packs of 500g of strawberries, conditioned in cardboards of 2kg. Plastic packs imported by Sanle Export from Abidjan with plastic covers and plastic packs without covers imported from Japan have been tested and compared.

ii) Results

- a) There were two types of plastic packs imported from Abidjan: one which covers had aeration holes and another without holes. Concerning the second type, almost all strawberries had mould on them on arrival in Abidjan. Fruits which were conditioned in the first type of pack and fruits which were conditioned in plastic packs without covers arrived in a comparable condition.
- b) By conditioning the strawberries in packs and cardboards, there were not crushed or damaged.
- c) The company supplying Abidjan supermarkets in fruits and vegetables requested the strawberries to be conditioned in plastic packs as a condition to import them. As a result of the conditioning trial, part of the strawberries which has been transported for this trial have been used to find an agreement with this wholesaler and 50kg of strawberries have been commercialized in a supermarket in Abidjan.

3) Transportation by Refrigerated Truck

i) Details

- a) Until now, strawberries were exported by airplane. However, passenger planes are used and transportable volumes are therefore limited. It is also necessary to adapt the harvesting

period to the flight schedule. In the future, if the exportation to the sub-regional increase, it will be necessary to consider of exporting by the road, which allows exporting more important volumes of fruits, including strawberries. Sanle Export has experience of fruit and vegetable transportation by road to Abidjan. By collaborating with Sanle Export, exportation by road has been tested with a refrigerated truck between Ouagadougou and Abidjan, in order to confirm the freshness, the cost and issues linked to transportation.

ii) Results

- a) Transportation by refrigerated truck is economically viable as many fruits and vegetable are transported at the same time. This time, losses at arrival in Abidjan were between 20 to 30%. It can be explained by the truck stopping by Bobo-Dioulasso on the road to Abidjan in order to load other fruits and vegetables, which took a long time, and by the transportation time, which took 60 hours from Boulmiougou to Abidjan. According to Sanle Export, transportation from Ouagadougou to Abidjan takes at least 30 hours, and it is therefore possible to reduce the necessary transportation time in the future.
- b) The temperature management during driving breaks and during the night was inadequate, and the truck was not cold during loading. It is probable that in addition of the long transportation time, an inadequate temperature management has implicated important losses. By managing the temperature adequately, it would be possible to reduce the losses.
- c) Even if the losses brought by a long transportation time and an inadequate temperature management inside the refrigerated truck had an important impact on this test, it has been confirmed that if transportation is shortened and temperature is better managed, road transportation is economically viable as many fruits and vegetables can be transported at the same time.



(5) Conclusions of the Pre-pilot Activity

During the pre-pilot activity, the following results have been obtained:

- a) The companies which participated managed to obtain 40 to 100 contacts of buyers during ICI

2014. Among the 3 companies, 2 of them stayed after the form in order to continue commercial discussions and negotiations.

- b) Sanle Export commercialized 50kg of strawberries for 3,500 FCFA/kg to a wholesaler in Abidjan, which commercialized them in a supermarket in Marcory for 5,900 FCFA/kg. After ICI 2014, the supplying manager for the wholesaler visited Boulmiougou site and made an additional order. In 2013, the harvest had already started when the commercialization started and there has only been one order after the end of ICI 2014.
- c) According to Sanle Export, this wholesaler intends to pursue importing strawberries for 2014 season. However, the supermarket indicated there were too many losses. In order to continue commercializing, it is necessary to take measures to reduce losses.
- d) Loss rates for fresh strawberries differ according to the conditioning. In the future, it will be necessary to improve conditioning and temperature management.
- e) Strawberry packs protect strawberries from damages provoked by the weight of other products and are requested by the supermarkets. It is necessary to order them locally. There is a plastic pack maker in Abidjan. According to the wholesaler, if the negotiations go through, he will supply the packs.
- f) Participating to forums or exhibitions are occasions to present Burkinabe products to numerous buyers and is a good means to discuss, share information, and negotiate directly with them. However, participation costs are very high, and it is difficult for companies to bear it alone. It is therefore necessary that DGPER support financially these companies. The supporting system must be considered inside the MARHASA.
- g) Companies which participated to ICI 2014 have been selected according to the selection process used by the DGPER. With the current support system of the DGPER, participants do not have to bear anything financially. This time, in order to motivate the participants, they had to bear accommodation costs and their own daily allowance. The participants though it would be best to continue asking participants to bear part of the costs in the future.



Burkinabe strawberries
(5,900 FCFA/kg)
Supermarket in Abidjan



Spanish strawberries
(15,200 FCFA/kg)
Supermarket in Abidjan



7.3.2 Outline of the Pilot Activity

(1) Background and Objectives

Even though strawberries have a relatively small economic impact, Burkina Faso is the only country in West Africa to produce them, and one may say they are a specialty of the country. Strawberries are a luxury product, for which consumers are wealthy people. The domestic demand is therefore limited, but with the efforts made by the producers until now, strawberries have been exported in imported urban areas of the sub-regional. In the future, with the economic growth and the increase of income of the sub-regional and in Burkina Faso, demand should increase again. Strawberries are largely distributed fresh, but are very sensible to shocks, and losses from damages suffered during transportation are high, which is an issue. In the future, volumes of commercialization to high end markets, such as supermarkets, in the sub-regional are expected to increase, and it will be necessary to improve conditioning accordingly, to adapt the harvesting period, improve post-harvest treatment and obtain a better fruit quality.

The existence of a supermarket demand in the sub-regional for Burkinabe strawberries has been confirmed during the pre-pilot activity. During this pilot activity, the hypothesis this below have been verified, by aiming at entering high end markets, such as supermarkets in the sub-regional, at differentiating with local markets, at adding value and at entering domestic supermarkets. The results and lessons learned obtained during this pilot activity have been used for the formulation of the promotion plan for strawberry and for improvement of its feasibility.

(2) Hypotheses to be Verified and Related Promotion Measures

Prospecting for new markets on high end sub-regional and domestic markets, as well as maintaining and expanding the production have been proposed as promotion measures. In this pilot activity, the four following hypothesis concerning these two measures will be verified.

Hypothesis 1: By improving harvesting operation and conditioning methods, losses will be reduced

Hypothesis 2: By selecting good fruits and improving conditioning, it is possible to enter the high end

market

Hypothesis 3: By introducing new varieties, the productivity and quality of strawberries improves

Hypothesis 4: By using accelerated cultivating techniques, the harvesting period is advanced in time

(3) Intervention by the Pilot Activity in the Value Chain

This activity pilot aims at prospecting for new markets on the domestic market, at maintaining and increasing production, and at commercializing on high end markets in the sub-regional such as supermarkets. It will therefore have an influence on producers, exporters and supermarkets of the sub-regional and of Burkina Faso.

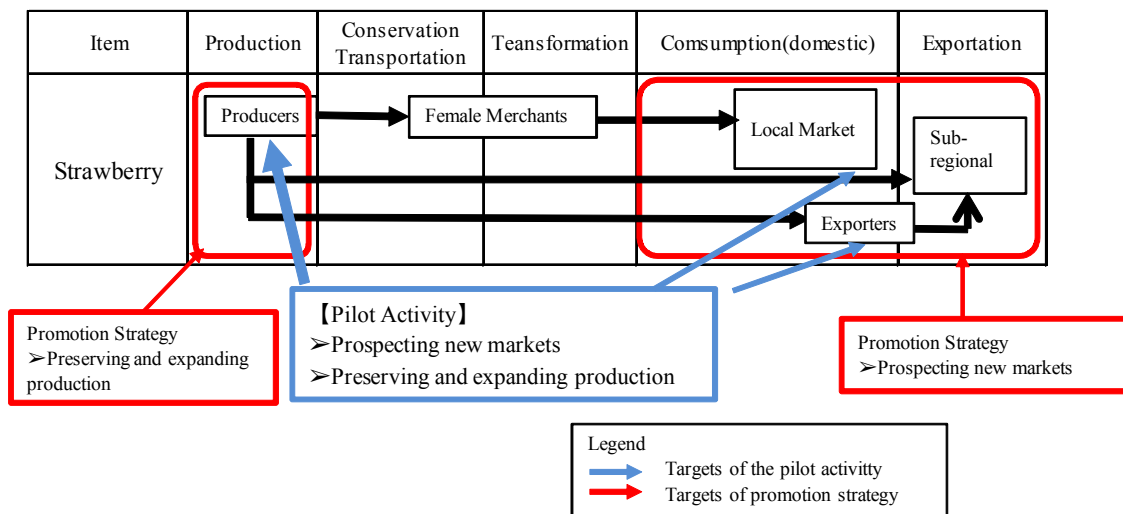


Fig. 7.3.1 Influence of the Pilot Activity on the Value Chain of Strawberry

(4) Contents of the Pilot Activity

1) Implementation Areas

This pilot activity aims at the production sites of the strawberry in Burkina Faso:

- Centre Region, Kadiogo Province, Ouagadougou (Boulmiougou, Bika)
- Hauts-Bassins Region, Houet Province, Bobo-Dioulasso (Kodeni, Kounima)

2) Targeted Groups

Strawberry producers in the locations this above

3) Implementation Period

September 2014 to February 2015

4) Implementation Organization

JICA team, DGPER

5) Contents of Activity

i) Prospecting for New Markets

i)-1 Prospecting for Markets Oriented toward the Sub-regional

As the domestic demand for strawberries is limited, it is necessary to take measures to increase exportations towards the sub-regional. In particular, urban areas such as Accra or Abidjan have seen their middle class increase with their economic growth, and the demand for strawberry should therefore increase. It is desirable that markets are found for strawberries in supermarkets in the future. Given that it is difficult for the producers alone to trade with the supermarkets in the sub-regional, it is necessary to collaborate with exporters.

During the pre-pilot activity, it is implemented in cooperation with Sanle Export, which is based in Banfora and Bobo-Dioulasso. It has experience to commercialize strawberries in a supermarket in Abidjan in 2013.

This supermarket wishes to continue buying strawberries during the 2014 production campaign and it is planned to export strawberries with other vegetables in a refrigerated truck. During the exportation of strawberries in the 2013 campaign, there was a 50% loss rate, which has been notified as too important by the buyer, who wished it to be improved. In this pilot activity, in order for exportations to Abidjan supermarkets to continue, a differentiation and added value trial, as well as a loss reduction trial will be implemented.

The one of exporter Fruiteq, based in Bobo-Dioulasso, exports fresh mangoes, French beans, pepper, etc. to the Netherlands. Fruiteq has never exported to Ghana, but has obtained the cooperation of the Embassy of Burkina Faso in Ghana, and has begun discussions with Ghanaian supermarkets to export fresh vegetables. The supermarkets interested by vegetables have expressed their interest for strawberries and have asked for samples of fresh strawberries.

In this pilot activity, an added value trial as well as a loss reduction trial will be implemented in order to find possibility in Ghanaian supermarkets, while collaborating with Fruiteq.

a) Commercialization with Added Value

When products are commercialized on high end markets such as supermarkets, high quality fruits, with an adapted size, form and taste are sought. In order to answer those needs, the fruits have been sorted in this pilot activity during the commercialization trial in supermarkets, by selecting fruits according to their size, form and maturity.

The producers and exporters do not have experience in sorting strawberries until now, and they will then become aware of the size, maturity, form, etc. research by the supermarkets during the sorting operation.

For the commercialization oriented to the supermarkets, conditioning is necessary, but as it is difficult to find plastic packs adapted to Burkina Faso's strawberries, the exporter will negotiate with the supermarkets in order for them to supply conditioning material.

b) Loss Reduction

In Burkina Faso, strawberries are harvested when completely ripe. However, strawberries are a weak film of fruit. When they are harvested completely ripe, they continue to ripe even after the harvest, the weakness film and gets damaged or crushed easily. Its conservation is therefore bad, and there is a high loss rate caused by crushing. During transportation to the sub-regional by truck or by airplane, in particular, the strawberries suffer shocks because of other loaded products. The fruits which have been crushed will spoil and cause additional losses. Losses for strawberries

are the consequences of shocks received during the harvest and transportation, and of temperature management. In order to decrease the losses, it is necessary to improve these points.

In order to decrease the losses, the 3 following activities will be implemented.

- **Adaptation of the Harvesting Period**

When the fruits are harvested completely ripe, the risks to damage them are higher. Moreover, when the fruits are harvested completely ripe, the ripening process continues even after the harvest, and the strawberries cannot be conserved very long. In order for the strawberries to be ripe when they are commercialized, the strawberries will be harvested before being completely ripe, when they are firm enough. By harvesting them when they are firm, the risk of damages during the harvest also decreases.

For the exportation to the supermarkets in the sub-regional market, the exporter will give instructions concerning the harvesting period. In this pilot activity, the producers will be supported in order for them to understand the meaning of harvesting earlier. The same support will be provided to the exporters.

- **Improvement of Harvesting Operation**

It is important to be careful in order to the strawberries do not suffer from any shocks during the harvest, but in Burkina Faso, the strawberries are thrown in basins or buckets during the harvest, which causes losses.

Sponges will be used on basins and buckets for the harvest, in order to reduce the impact of shocks received by the fruits. At the same time, producers will receive explanations concerning the issues and points to be improved for the harvesting operation, and will be supported so they can continuously implement the improvements of the harvesting operation. Moreover, it will be recommended to exporters that by improving the harvesting, it is possible to improve conservation and to reduce losses during transportation.

- **Improvement of Conditioning**

Strawberries are directly conditioned in cardboards which are used for the exportations of French beans to the sub-regional. If those cardboards collide with other packages during transportation, strawberries are easily crushed.

In order to decrease losses during transportation, sponge will be used to block the strawberries inside the cardboards. Moreover, during the transportation in a refrigerated truck, the cardboard will be put into wooden or plastic cases, in order not to be crushed and the possibilities of decreasing the losses will be verified.

i)-2 Prospecting for New Markets in the Domestic Market

For the commercialization on the domestic market, commercialization routes are already established, from purchasing on the fields by female merchants to the commercialization on local markets and to restaurants. The domestic market is saturated during the harvest peak and, because it would be difficult to increase commercialization volumes without competing with female merchants, there is no other way than finding new prospects.

Strawberry buyers are foreigners and wealthy class people, and there is a stable demand for the strawberry as a luxury product in supermarkets and restaurants for those people in Ouagadougou. Entering the supermarkets oriented to wealthy class people is therefore a promising new market.

This pilot activity will try to differentiate the commercialization method of producers from the female merchants' method, and will implement a direct commercialization trial with supermarkets, which seems to be promising prospects, if the fruits are sorted and conditioned.

ii) Maintaining and Enlarging Production

As a speciality of Burkina Faso, it is expected that prospects can be found for strawberries or enlarged for the sub-regional. However, the runner plants productivity has been decreasing year after year with their deterioration, and it is probable that the production quantity decreases in the future. Since strawberry is a plant propagating with runners, it will be difficult to increase the production immediately even if the demand increases with prospecting for new markets. Increasing the production would require several years. In the pilot activity, the 3 following activities will be implemented in order to have a stable production structure.

a) Introduction of New Runner Plants

Currently, the runner plants used are propagated for 30 years by the producers. The runner plants have gotten deteriorated, their productivity has decreased and their fruits are less sweet than before. Last year, a variety had been introduced as a trial, but it was not really adapted to the cultural conditions of Burkina Faso, and the producers have almost not been able to propagate it.

In this pilot activity, in order to improve the quality and the productivity, the three varieties with different characteristics will be imported from a nursery company in France, and their adaptability to Burkina Faso cultural conditions will be tested. The three new varieties introduced will be the same type of varieties of the variety already cultivated, which is resistant to high temperatures.

b) Forcing Culture Trial

During the harvest peak between February and March, the volumes harvested are higher than the demand of the domestic market, which becomes saturated, and prices decrease. All producers cultivate according to the same cultivation calendar, which leads to this situation. If it was possible to shift the cultivation calendar, it would therefore be possible to appease the market.

In this pilot activity, in order to forcing the flower steaks, techniques of forcing culture will be tested and the possibilities of advance the harvesting periods in Burkina Faso will be examined. In Burkina Faso, the 3 methods this below, easy to implement, will be introduced and their effects will be verified.

Table 7.3.2 Techniques of Forcing Culture Tested

	Methods
Prune the roots	After having transplanted the runner plants on the field, runner plants are removed with the roots about a month before develop the flower steaks (mid-November), and then planted next to it. By cutting the roots, there will have more roots and the runner plants will be less sensible to shocks and damage.
Control of carbon and nitrogen	By not giving the runner plants nitrogen fertilizer (NPK, UREA, DPA), about a month before develop the flower steaks, flower steaks is being advance. By decreasing nitrogen levels in the plant before develop the flower steaks, flower steaks is said to be faster.
Removing leaves	After having transplanted the runner plants on the field, it is possible until blossoming, by removing leaves and leaving only 5 to 8 leaves by runner plant, to prevent dead leaves, illnesses and insects. The effects on develop the flower steak are unknown but good runner plants (with a lot of leaves), are tending to blossom later. Moreover, by removing dead leaves and leaves attacked by illnesses or insects, the runner plant is protected from factors which could prevent its growth, which should be advance the development of flower steaks.

c) Forming Production Areas

In Bobo-Dioulasso, strawberries are cultivated at a very small scale. The runner plants used are deteriorated and numerous of them have been lost over the years, and the number of producers has decreased. Furthermore, compared to Ouagadougou, fruits are little and less sweet. In Bobo-Dioulasso, in order to improve the quality of fruits, the productivity and to stabilize the strawberry productivity, new runner plants will be brought to the two production sites.

In the future, the production quantity is expected to increase, but the demand in Bobo-Dioulasso is limited, and even if strawberries were produced in a stable way, there are no commercialization prospects currently. However, Bobo-Dioulasso is near of Accra and Abidjan than Ouagadougou for road transportation, and there are numerous fresh vegetable exporters, which gives Bobo-Dioulasso advantages for the exportations towards the sub-regional. An exportation trial towards the sub-regional from Bobo-Dioulasso will be implemented with the collaboration of exporters.

7.3.3 Implementation and Results of the Pilot Activity

The pilot activity has been conducted according to the planning this below.

Table 7.3.3 Planning

Activities		2014				2015									
		9	10	11	12	1	2								
(1)	Prospecting for markets														
(1)-1	Prospecting for markets on the sub-regional market														
(1)-2	Prospecting for markets on the domestic market														
(2)	Maintaining and enlarging markets														
1)	Procurement of new runner plants														
2)	Introduction of new runner plants														
3)	Formation of production areas														

(1) Prospecting for Markets

(1)-1 Prospecting for Markets on the Sub-regional Market

Prospecting activities have been implemented with the cooperation of two exporters, Sanle Export and Fruiteq, with supermarkets in Abidjan and Accra.

In this pilot activity, measures to added value and decrease losses have been taken with Sanle Export to export 100kg of strawberries by airplane to the central purchasing service PROSUMA (Société Ivoirienne de Promotion de Supermarchés). In this trial, strawberries were sent using a passengers' flight which took off in the evening, and the strawberries have been harvested and conditioned during the day.

On arrival in Abidjan, 65kg of strawberries were in condition to be sold, while 35kg were lost (35%). Compared to the 2013 season, the strawberries were little, but the supermarket judged that the form, the color, the odor and the taste of the strawberries was of a level good enough to be sold.

As before, there were losses during transportation, but strawberries have sold to PROSUMA at 3,500 FCFA/kg, and have been commercialized in 4 supermarkets in Abidjan (HYPER HAYAT Marcory,

PRIMA, CASINO ALABRA, HYPER HAYAT Deux–plateaux) at 4,800 FCFA/kg. Strawberries imported from France were sold at 12,800 FCFA/kg. Burkina Faso’s strawberries have a stable quality and are less expensive to import than strawberries imported from Europe. It has therefore been confirmed that strawberries can be sold in supermarkets.

This time, an evening flight has been used, but PROSUMA suggested to use a flight taking off in the morning, in order to avoid the ripening of strawberries before that are commercialized in supermarkets, and therefore to avoid Sunday’s flight. PROSUMA has also suggested to use carbon dioxide to decrease the temperature during transportation.

For prospecting for markets in Ghana, a trial has been implemented in collaboration with Fruiteq, which has started to export fresh vegetables to Ghana in 2015. Supermarkets buying vegetables to Fruiteq are interested by strawberries and as they are new promising prospects, a prospecting activity has been implemented.

For this pilot activity, samples have been prepared by sorting strawberries and by improving conditioning, and sent by refrigerated truck to negotiate with supermarkets.

1) Commercialization with Added Value

Harvested strawberries have been sorted between first class quality and second class quality, according to their form, size and ripeness. First quality strawberries have again been sorted between strawberries with an adequate ripeness and completely ripe strawberries, whereas second quality strawberries have been sorted accord to their form and size.

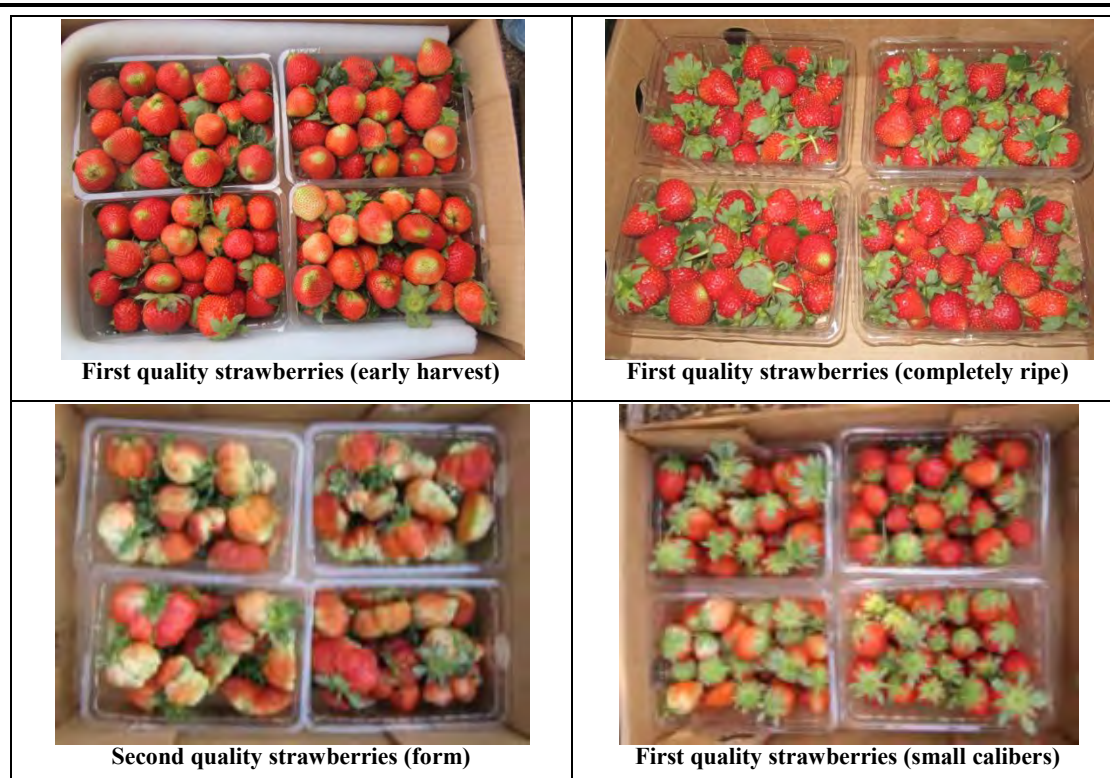
In this pilot activity, it has been confirmed if it was possible to commercialize Burkinabe strawberries to the supermarkets in Abidjan and Accra by sorting them and conditioning them in plastic packs.

In Abidjan, the products commercialized in supermarkets are first bought by PROSUMA, which then sells them to supermarkets. Excepting the caliber, PROSUMA and the supermarkets evaluated they could commercialize strawberries. According to supermarkets, consumers in Abidjan prefer big strawberries, and it is therefore important to choose strawberries of a big caliber when sorting them. Moreover, they also asked to take off dust and sand during the conditioning, in order for the strawberries to be in good conditions.

This time, 500g of strawberries were conditioned by plastic pack. PROSUMA and the supermarkets observed that the strawberries in the lower part of the pack were crushed with 500g, and that it was desirable to limit the weight to 300g by plastic pack. In Abidjan, it is possible to buy plastic packs in supermarkets, at 5,000 FCFA for 100 plastic packs. Strawberries sold on local markets are also commercialized in plastic packs, which are bought in supermarkets.

Concerning the conditioning form, between the strawberries imported from France, Morocco and Lebanon, the conditioning of French strawberries is by far the best, and as they are conditioned individually, they can be sold as such, directly in supermarkets at their arrival in Côte d’Ivoire.

Given that the commercialization price of the strawberries on local markets in Abidjan remains the same during the campaign. It is desirable to send good quality strawberries to the supermarkets at a higher price, and to sell strawberries which were not bought by the supermarkets on the local market.



2) Loss Reduction

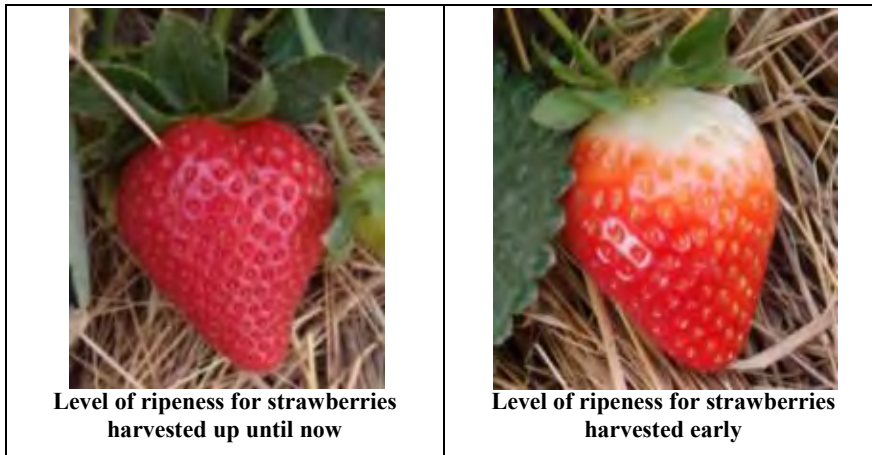
i) Adjusting the Harvesting Period

Up until now, the strawberries were harvested when completely ripe, but in order to improve the conservation and to decrease losses during transportation, strawberries which have been commercialized in supermarkets in the sub-regional or in Burkina Faso have been harvested before being completely ripe.

Concerning early harvesting, there is no special need for material or equipment, but the producers need to understand when they have to harvest. During this pilot activity, in order for producers to understand when they needed to harvest, strawberry pictures have been used to explain when they should harvest, by using the strawberry color. Moreover, the adequate firmness for harvesting has been explained to the producers by having them touch strawberries of different ripeness degrees. The producers understood the objectives and advantages of harvesting earlier.

By harvesting earlier, it is possible to improve the conservation of strawberries, avoid damaging or crushing the strawberries, compared to harvesting when the strawberries are completely ripe. During the trial of commercialization in a domestic supermarket, detailed this after, it has been possible to commercialize the strawberries up until 5 days after their harvest. Harvesting early is therefore efficient to decrease losses and improve the conservation of strawberries. Moreover, concerning the exportations to the supermarkets, losses compared to the last campaign have been reduced.

However, female merchants still avoid commercializing strawberries which are completely ripe, and the strawberries sold on the domestic market are therefore still sold at this level of ripeness.



ii) Improvement of Harvesting Operation

In order to decrease the damages received by the strawberries during the harvest, sponges have been used on basins in which are harvested the strawberries, as a shock absorber. The sponge used is a 5mm large sponge, which can be bought in Burkina Faso. By using the sponge, the number of crushed strawberries has decreased during the harvest.

The improvement of harvesting is very simple and it is also easy to find the sponge used as a shock absorber. It is desirable to use this type of shock absorber in the future. Strawberries are harvested by hand, but part of the producers harvest the fruits for the exportation to the sub-regional market without touching the fruits themselves. With this type of considerations for harvesting methods, it is possible to protect the quality of strawberries. It should be extended to other producers.



iii) Improvement of Conditioning

Up until now, strawberries were exported to the sub-regional only in unprotected cardboards, and suffered losses because of shocks received during transportation. In this pilot activity, when strawberries have been sent to Accra with a refrigerated truck, two conditions, which were cardboards without protection and cardboards in wooden frames, were compared to confirm the impact of shocks received during the transportation.

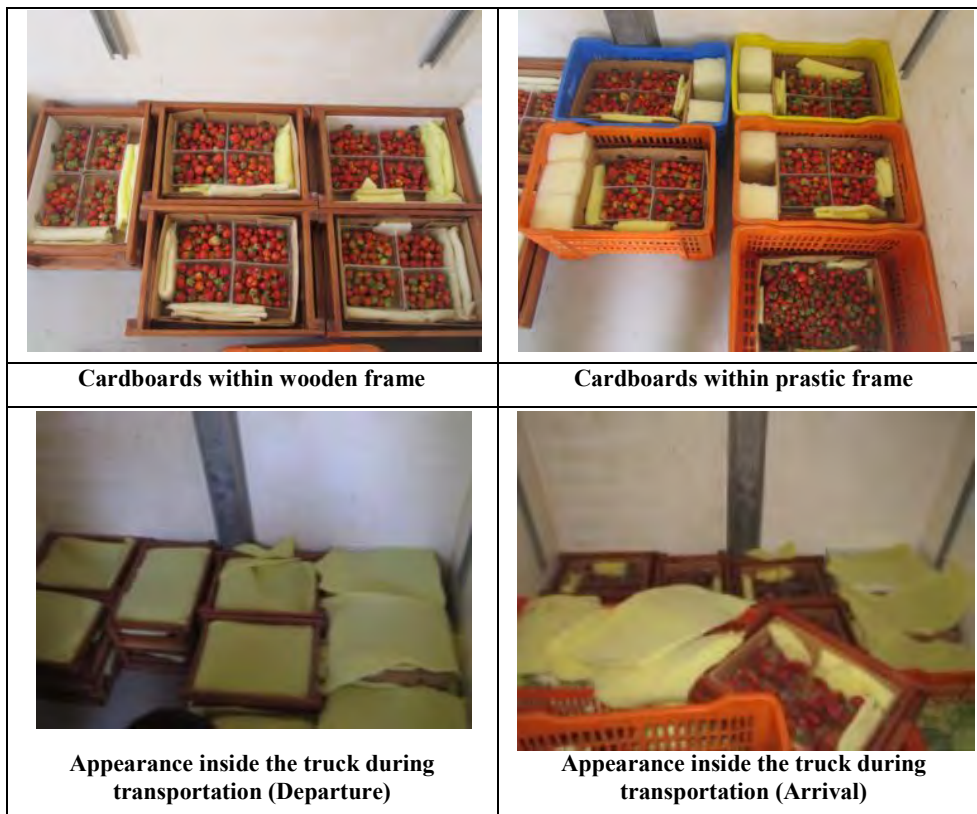
Cardboards loaded without protection have been crushed because of the shocks they received, as well as the strawberries which were conditioned in the cardboards, which have been disposed of.

However, cardboards which were protected by wooden frames have been protected from shocks and the strawberries have been transported without getting crushed. The efficiency of wooden frames to decrease losses for transportation by refrigerated truck has therefore been verified.

Concerning the exportation to Abidjan, the cardboards have been put inside plastic pallets and sent by airplane. Compared to the method used until now, with which a lot of fruits were crushed because of the shocks and frictions received, the losses have been reduced with the use of plastic pallets.

Moreover, during transportation for both destinations, sponges have been used to fill up interstices inside the cardboards, between the plastic packs, inside the pallets, between the pallets and the cardboards. According to the procurement agent of PROSUMA in Abidjan, with this method, strawberries receive less shocks and frictions, which prevent losses.

However, plastic pallets are products which already existed before, and which are not adapted to the size of the cardboards used for strawberries. For this trial, two cardboards by pallets have been put into one pallet and sponges have been used to fill up the space, in order to block the cardboards and prevent shocks. According to PROSUMA, it is not desirable to put two cardboards by pallets. Moreover, the cardboards used, which are originally made for French beans, do not allow enough ventilation.

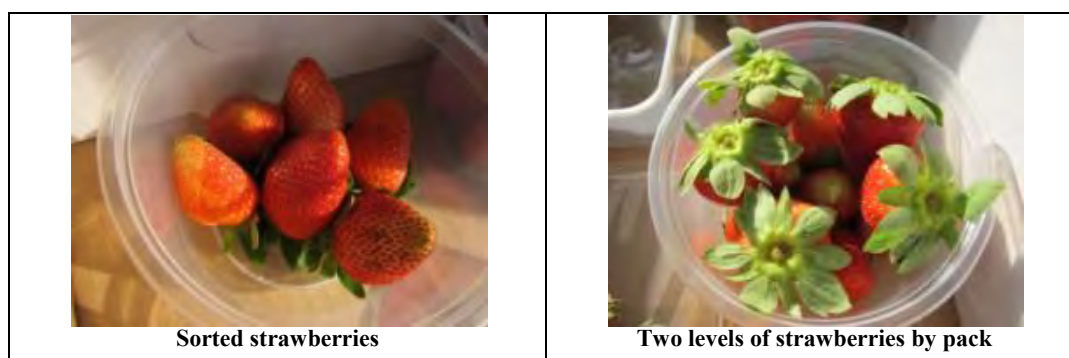




(1)-2 Prospecting for Markets on the Domestic Market

A commercialization trial with added value for strawberries in a supermarket of Ouagadougou has been implemented with the cooperation of Bika producers, in order to find a commercialization method different from the existing methods and to find new prospects on the domestic market.

Fruits of different calibers, colors and forms have been harvested. The strawberries which had a nice form and a sufficient caliber, and had an adapted ripeness level, have been sorted and conditioned in plastic packs, in order for their tip not to touch the pack. There were 250g of strawberries by pack.



After negotiating with the supermarket, the commercialization of 10 packs has been tested over a week. Producer's price by pack has been decided by taking into account the price of strawberries, packs and transportation, and has been fixed at 1,000 FCFA by pack after discussing with the producers.

Given the type of pack, which was packs with covers, and given the small volume of strawberries transported for one supermarket, unit transportation costs were high, and the price by unit increased. When the commercialization trial has been implemented, female merchant sold strawberries at 2,500 FCFA/kg.

Table 7.3.4 Selling Price Structure

Item	Price	Unit Price
Strawberries (producers' price)	2,000 FCFA/kg	500 FCFA
Plastic packs	150 FCFA/pack	150 FCFA
Transportation costs (field to supermarket)	1,262 FCFA (2L)	125 FCFA
Profit	N/A	225 FCFA
Producer price	N/A	1,000 FCFA

After considering personnel and electricity costs, the supermarket commercialized the strawberries at 1,500 FCFA a pack.

After a week of commercialization, only 2 packs have been sold. The selling price was twice higher than the selling price of the female merchants, and the clients were probably not interested for this kind of price. There was no female merchant selling strawberries on a both in front of this supermarket, but there is a street vendors around the supermarket. The clients could therefore compare the prices and they may not have been ready to accept the supermarket selling price if it was not equivalent to the selling price of the female merchants. There are therefore various pricing issues, and supermarkets still cannot commercialize strawberries.



The strawberries used for the commercialization trial could still be commercialized 5 days after the harvest, and the supermarket has highly appreciated their quality. If the sorted and conditioned strawberries could be sold at the same price than the strawberries sold by the female merchants, there is a possibility they could be sold in supermarkets. However, for supermarkets, it is difficult to deal directly with producers, and it is desirable that a company or an association acts as an intermediary. It is therefore difficult to consider that producers only could sell directly their products, and support from DGPER is necessary.

(2) Preservation and Expansion of Production




1) Introduction New Runner Plants

Three new varieties have been imported from the nursery company ANGIER in France. 3,000 runner plants of 3 varieties, Festival, Ruby Gem and Sweet Ann, 9,000 runner plants in total, have been bought. These new varieties have been introduced on the four cultivation sites of Boulmiougou, Bika, Kodeni and Kounima. The number of runner plants by site has been decided on the basis of the number of producers. It is detailed this below.

Table 7.3.5 Number of Runner Plants Introduced by Site

Location		Number of Runner Plants
Ouagadougou	Boulmiougou	6,000 (2,000 ×3 varieties)
	Bika	2,100 (700 ×3 varieties)
Bobo-Dioulasso	Kodeni	630 (210 ×3 varieties)
	Kounima	270 (90 ×3 varieties)

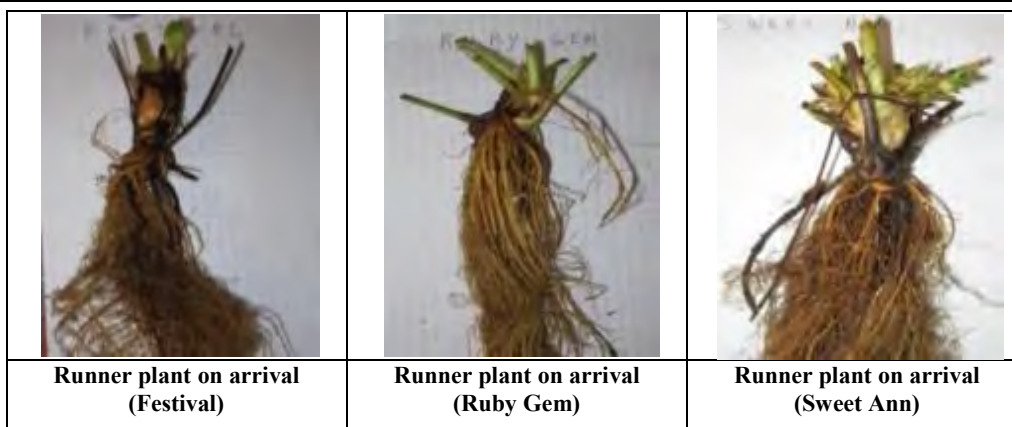
Table 7.3.6 Varieties Introduced during the Pilot Activity

<p>FESTIVAL</p> 	<p>Developed by: University of Florida, USA Released: 2000 Type: Short day Pedigree: “Rosa Linda” × “Oso Grande” Fruit shape: Conic Fruit color: Medium Red and glossy Fruit is typically firm Flavor: Good Yield: High • Early fruit onset</p>
<p>RUBY GEM</p> 	<p>Developed by: Queensland Department of Primary Industries and fisheries (QDPI&F), Australia Released: 2003 Pedigree: ‘Earlibrite’ (Chandler et al., 2000a) × ‘Carlsbad’ (Voth et al., 1994) Type: Short day Fruit is firm Fruit size: large Fruit color: red and glossy Fruit shape: long conic to cordiform with some short wedge Yield: large</p>
<p>SWEET ANN</p> 	<p>Developed by: Lassen Canyon Nursery (USA) Released: 2011 Type: Day-neutral Fruit shape: Long Conic Pedigree: “4A28” × “10B131” Fruit is Medium firmness Fruit size: Large Fruit color: Medium glossy red Flavor: good acid-sugar balance and sweet • The variety runners well in the nursery, but produce few runners in the fruiting field.</p>

Source: <http://www.emcocal.com>

Runner plants for these three varieties have been sent refrigerated by airplane and arrived on 24th October in Burkina Faso. The new runner plants have been distributed to the producers on 25th October in Boulmiougou and Bika and 26th October in Kodenii and Kounima, and culture began. The adaptability to the cultural conditions of Burkina Faso of the 3 varieties have been tested on the 4 sites.

In order to continue the culture of the 3 introduced varieties, it is important to propagate the stolons and therefore produce runner plants. This is why differences in the number of stolons and runner plants for each variety have been verified.



The cultural situation of the 3 varieties for each site at the end of February 2015 is detailed this below.

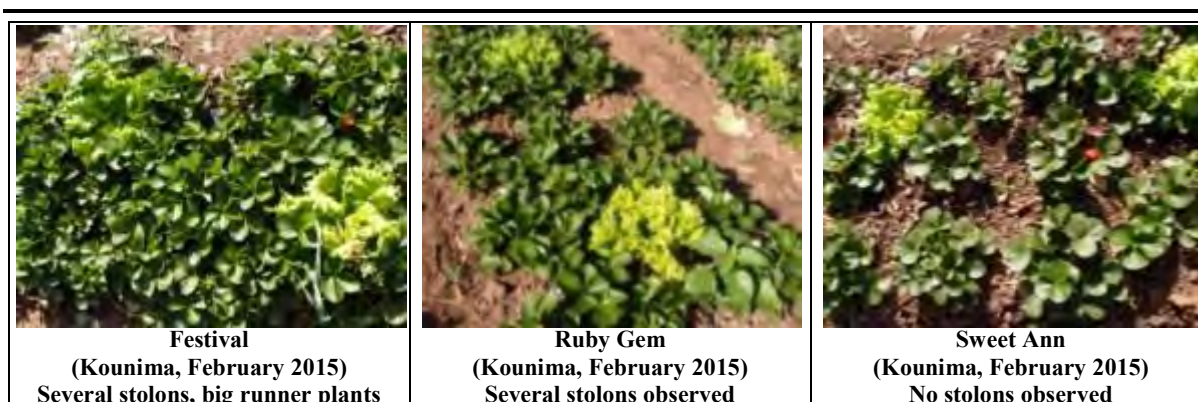
Table 7.3.7 Growth Situation for Each Variety

Variety	Boulmiougou	Bika	Kodeni	Kounima
Festival	There are differences depending on the producers, but there are a lot of stolons. The runner plants grow well. Part of the producers already harvested several times.	There are a lot of stolons, and those which appeared early already produced 3 runner plants. The volumes are small, but the producers already harvested several times.	There a lot of stolons, and a lot of them already produced runner plants. The runner plants are growing well.	There are a lot of stolons, and of the three varieties, the fruits appeared the fastest. The runner plants are growing well.
Ruby Gem	Blossoming began, and part of the runner plants already have runners	There are a lot of stolons, even if there are fewer stolons than for Festival. Some of them already have runner plants.	After transplanting on the field, part of the runner plants has been lost for an unknown cause. The rest of the few runner plants has runners.	There are a lot of stolons, even if there are fewer runners than for Festival.
Sweet Ann	Part of the runner plants has runners, but their number is low compared to the other varieties.	Has the smallest growth and the fewest number of stolons	After transplanting on the field, part of the runner plants has been lost for an unknown cause. There are no runners.	No runners, fewer flowers compared to other varieties.

Until February 2015, Festival had the best growth and the more important number of stolons. Several stolons have been observed on some plants, and they produced 4 runner plants at most. Moreover, Festival has produced fruits the fastest, between the 3 varieties on the 4 sites, with a first harvest in Boulmiougou on 20th December.

Ruby Gem also was a good growth, with plants, and stolons which have been observed on several plants at the end of February. Moreover, there are also stolons which produced runner plants. Sweet Ann has the worst growth on the 4 sites, and the plants have all almost been list in Kodeni. Compared to the two other varieties, Sweet Ann was small plants, and there are almost no stolons.

Sweet Ann is a day-neutral variety, whereas the two others are short-day varieties. Given the current results, short day varieties are expected to be able to be cultivated under high temperatures and highly adapted to Burkina Faso's cultural conditions.



2) Forcing Culture Trial

In order to bring forward the harvesting period, 3 techniques to develop the flower steaks have been tested and their efficiency in Burkina Faso's cultural conditions have been verified. These techniques have been tested in Boulmiougou, where the producers have the most experience in strawberry culture and where there are the most producers. After discussions, the producers' group of Boulmiougou chose one producer by group (5 producers in total). For this trial, current varieties have been used.

Table 7.3.8 Producers Participating in the Forcing Culture Trial

Group	Producer Name
Wend Manegda	Kaboré gernard
Teega Wendé	Sini Ali
Wend Songda	Deme Paul
Nabons Wendé	Compaoré Arassen
Sougr Nooma	Kaboré K. Sylva

Results are detailed this below. It was not possible to develop the flower steaks with techniques used during this trial.

Table 7.3.9 Results of the Forcing Culture Trial

Method	Results	Number of Runner Plants
Prune the roots	Same period of development the flower steaks than for the traditional method	50 runner plants ×5 producers
Control of carbon and nitrogen	Same period of development the flower steaks than for the traditional method or a little late. Less flowers than the traditional method.	50 runner plants ×5 producers
Removing leaves	Same period of development the flower steaks than for the traditional method	50 runner plants ×5 producers

In Burkina Faso, runner plants are transplanted from the nursery to the field from mid-October to mid-November, and the flower steaks generally develop in mid-December, about a month after transplantation. It is therefore possible that the introduction of techniques of forcing culture happened too late, if is introduced at transplanting. Moreover, producers do not have knowledge concerning those techniques, and are therefore limited in their implementation. INERA should change their implementation condition and implement a field research with a cultural test on several years.

3) Formation of Production Areas

In order to pursue strawberry cultivation in Bobo-Dioulasso, new runner plants from 3 different

varieties have been introduced. Festival and Ruby Gem are varieties which adaptability to Bobo-Dioulasso cultural conditions are considered high, but compared to Ouagadougou, runner plant losses have been important.

During the implementation of this pilot activity, differences in cultivation methods in Ouagadougou and Bobo-Dioulasso have been observed. The main difference lies in the protection of the fruits by straws in Ouagadougou, whereas producers do not use straws and leave the fruits ripening directly on the soil in Bobo-Dioulasso. There are therefore fruits which spoil or are damaged after having touched the soil in Bobo-Dioulasso. According to the producers of Bobo-Dioulasso, by using straw, humidity would increase, which would lead to the fruits rotting, which is why they do not use straw.

The harvested strawberries are bigger in Ouagadougou and have a better form. Moreover, fruits are less damaged, sweeter, and their quality is overall better than in Bobo-Dioulasso. In Ouagadougou, the cultivation level is higher and there are more producers. Producers are therefore able to improve their techniques between them. It is necessary to organize experience sharing workshops between producers in Ouagadougou and Bobo-Dioulasso to improve cultivation techniques.

7.3.4 Lesson Learned and Issues

(1) Packaging is important for reduction of loss and promotion of purchase.

Strawberry is bruised easily by shock. Strawberries packed directly to cardboard box have large of loss during transportation. The utilization of plastic pack can reduce the loss by transport.

Strawberry is luxury product and it purchase by wealthy class people and foreigners. The visual of product is important for promotion of sales. Moreover the strawberry sales to the luxury product market have to pack in plastic pack.

(2) The purchase channel of packaging materials is necessary.

The package materials included plastic pack for strawberry is not produced in Burkina Faso. The cardboard box of French bean can use for substitute but the plastic pack is not available in Burkina Faso. It is need to import from sub-regional counties or request the provision to the buyer.

(3) Harvesting period is necessary to consider the period for transportation.

The fruit is being ripened even after the harvest. As time goes by, the fruit is more easily to receive damages and it being loss. The transportation of strawberries after the fruits fully ripened is made a large of loss. The period of the harvest have to consider that the fruits to be ripened fully at time of sale. The harvesting period is decided to subtract counted days from day of ripened.

(4) Promotion of agricultural production of Burkina Faso in international exhibition is need the financial support from MARHASA.

The promotion of agricultural products in Burkina Faso for exportation is needed the opportunity of promotion as participation of the international exhibition. However, the participation in forums that require high exhibition fees, financial assistance is needed. MARHASA should consider of developing facilities to address such financial needs of the private sector.

(5) INERA and MARHASA need to collect the information and experience of strawberry cultivation.

The cultivation technique in Burkina Faso was established by producers based on their experience. INERA and MARHASA are not has information of technique for strawberry cultivation. The basic information of strawberry cultivation such as production areas, quantity, varieties is not collected as statistical information of agricultural products of the Burkina Faso. It is necessary to collect the basic

information and cultivation technique and experience for strawberry promoted as special product in Burkina Faso.

(6) Preservation of adapted varieties is need to collaboration with INERA.

Strawberry is propagated themselves and the genetic information of runner plants is same. It is guessed the same genetic information is received massive damaged if disease is occurred. The runner plant is deteriorated by repeated propagation. The improvement of the deterioration of runner plant is only exchange the runner plants. New runner plants have to import from Europe. The nursery company of Europe is not accepted to export the runner plants below minimum lot of order. It is expected the INERA propagated the runner plants of adapted varieties for renewal. Thus, the producers can renewal the runner plants by little if necessary.

(7) Support for provision of information from DGPER is necessary to develop new market by exporter.

To prospect for new markets is difficult by producers or exporters especially, because of language. It is expected that DGPER collected the market information from Diplomatic establishments abroad and CCI-BF for promotion of sales. In case of Fruiteq, they were requested the provision of market information to embassy of Burkina Faso in Ghana. Fruiteq received the information of strawberry market in Ghana and they implemented the promotion of sales to Ghana. It is necessary that DGPER collected the information of targeted market and provide it to the producers and exporters.

7.3.5 Feedback to the Promotion Plan

The lessons learned and opinions of the participants of the pilot activity are used for formulation of the promotion plan and necessary activities are introduced into the promotion plan. In addition, information of quality of fruits and packaging needs is collected from exporters, supermarkets both in sub-regional and domestic markets and restaurants to use it for the promotion plan.

(1) Collection of Variety Information for Introduce of New Varieties

In the pilot activity, the information of available varieties, possible period to export, types of runner plant are collected from catalog of the nursery company. In addition, requested to pick up the adaptable varieties in Burkina Faso to the nursery company. Based on the collected information, 3 varieties that developed in United States (Florida and California) and Australia such as Festival, Ruby Gem and Sweet Ann are selected. As a result of pilot activities, the Festival and Ruby Gem are growth well in the field among 3 varieties. Two varieties are short-day variety. It guessed the variety of ever-bearing and short-day is adaptable variety of cultivation in Burkina Faso.

(2) Collaboration with CCI-BF

One of strawberry buyer in Ghana contacted to CCI-BF Ghana branch to find exporter of Burkinabe strawberries. This kind of inquiry will able to link to the business. CCI-BF will become source of information of business. Through the information from CCI-BF will able to develop the market. DGPER need to work in collaboration with CCI-BF for development new market.

7.4 Promotion Plan for Strawberry

7.4.1 Framework of the Promotion Plan

(1) Principle of Planning

Strawberries have been selected as potential products of promotion targeted to the sub-regional market. It is especially promoted to luxury product market in the sub-regional countries. This promotion plan is mainly established measure for the promotion issue. The goal of this plan is to improve the

productivity and increased quantity of exportation is toward the income generation of producers.

(2) Target Duration

The target duration will be set to 4 years starting from the beginning of the activities.

(3) Target Area

Boulmiougou and Bika in the suburbs of Ouagadougou and Kodené and Kounima in the suburbs of Bobo-Dioulasso are the target area for this plan.

(4) Vision

Strawberry promotion will be focused on the sub-regional markets that large scale and high price than the domestic market. Sub-regional market can be expected the growth of market scale and the producers can gain more benefit. In the other hand, the selection of high quality fruits can be expected to prospect for the luxury product markets both in sub-regional and domestic. It is mainly focused on the sub-regional market to promote prospecting for new markets, expansion and diversification of markets.

The estimation of demands for strawberries in sub-regional market is difficult because of the constraints of statistical data. The sales quantity to the domestic market is changed by year but it will give a rough quantity. There is around 20 tons per year. According to the consideration of the population in capital city and middle class, the demand of Ghana and Cote d'Ivoire is assumed the several times of Burkina Faso.

Therefore, the vision of this promotion plan is “To increase the quantity of exportation of Burkinabe strawberries to the sub-regional markets”.

(5) Goal

Strawberry cultivation will be preserved and it will be increased quantity of sales to both sub-regional and domestic market. The selection of the high quality fruits and packaging will be added value of sales. It will be realized that to sell to the luxury product market in both sub-regional and domestic markets. Prospecting for sub-regional markets will increase the quantity of exportation of Burkinabe strawberries.

7.4.2 Promotion Strategies and Programs

The promotion strategies and programs to reach the vision above are the followings.

(1) Prospecting for Markets (Promotion Strategy 1)

“Program for prospecting for new markets” is established for realizing the promotion strategy of prospecting for markets of Burkinabe strawberries. The following two projects are implemented under this program for diversification of markets and increase the quantity of sales.

i) Strengthening of Marketing Capacities for Sub-regional Markets

Strengthen the capacities of producers and exporters to increase the exportation quantity of Burkinabe strawberries to the sub-regional markets. The consideration of marketing to the sub-regional market is different between luxury product market and local market. In addition, it is necessary to control the quantity of export between domestic market and sub-regional market. Strawberries are luxury product. The importance of strawberries exportation is to meet the needs of consumers. Thus, the stakeholders of strawberries exportation have to share the market needs among them. The market survey and the market needs collection will be done as promotion

activities.

ii) Commercialization with Added Value by Producers to the Domestic Market

The market in the domestic market is already established and demand from local market is satisfied. The promotion activities to expand the market in the domestic market are commercialization with added value to discriminate the existent way of sales. The selection of high quality fruits and packaging will be done as objective of sales to the supermarket. The training of promotion of sales will be done to the producers.

(2) Preservation and Expansion of Cultivation (Promotion Strategy 2)

“Program for preservation and expansion of cultivation” is establish for realizes the promotion strategy of p preservation and expansion of strawberry cultivation. The following three projects are implements under this program for stable supply system and improvement quality through the action of improvement of productivity, advance of harvest period.

i) Selection of the Adaptable Varieties

The new varieties that can adapt the cultivation in Burkina Faso selected and introduced for improvement of productivity and establishment of stable production system. The introduced varieties are selected based on the information of characteristic of variety. The characteristic of varieties such as the varieties adapted cultivation under high temperature following varieties, improved varieties, and the varieties excellent for storage or transportation are collected to selection. The selection and introduction of new varieties will be done together with producers. The INERA implemented the field test of cultivation for identify the adapted varieties. The INERA is requested to the nursery company for technical support if necessary. Based on the result of cultivation test, the INERA is registered the adapted varieties, developed the list of characteristic of adapted varieties and established technical guideline.

ii) Introduction of the Forcing Culture

The cultivation calendar in Burkina Faso is same among all producers. It is caused that the harvesting period of strawberry is same among all producers. The other cultivation calendar to advance the harvesting period is introduced. It can be alleviated the full of strawberry in the market at the peak season and prolonged the harvesting period. The control of carbon and nitrogen and prune the roots are the technique of forcing culture. The adapted technique of forcing culture in Burkina Faso is unknown. The implementation the introduction of the technique in the field as test for identifies adaptable technique in Burkina Faso.

iii) Strengthening of the Secondly Production Area

The adaptable varieties are introduced in Bobo-Dioulasso to improve the productivity. In same time, the producers collaborated with exporter to prospect for markets in sub-regional countries. It will expand the quantity of production in gradually if market of sub-regional is established.

Implement the exchange of views between the producers of Bobo-Dioulasso and Ouagadougou to improve and share the technique of culture.

7.4.3 Projects

(1) Project for Strengthening of Marketing Capacities for Sub-regional Market

1) Background and Objective

The demands of strawberries in the domestic market were satisfied. From now on, it is guessed that

the demand of strawberry from the domestic market will not be increased. It is expected to develop the market in the sub-regional and expansion the export. Ghana and Cote d'Ivoire has a large population of middle class and the remarkable economic growth. It can guess demand of strawberry can be increased.

Strawberries are luxury product. It is necessary to meet the needs of consumers for expand the market. The supermarket in Abidjan and Accra are sold fresh strawberry imported from Europe. Burkinabe strawberries have to meet the needs of supermarket for sell in the supermarkets. The producers and exporters should be collaborates to strengthen the capacity of marketing. The exporters are expected to control the quality of fruits for exportation to the supermarket.

2) Target Area

Target area is production site of strawberry at Boulmiougou and Bika in Ouagadougou, production site at Kodenin and Kounima in Bobo-Dioulasso.

3) Stakeholders and Target Group

Stakeholder: DGPER, INERA, DGPV, DRARHASA, MICA and CCI-BF

Target group: Producers and Exporters

4) Activities and Actors

This project is implemented mainly by DGPER.

Table 7.4.1 Activities and Actors of Project for Strengthening of Marketing Capacities for Sub-regional Market

Activity	Actor	Contents of Activity
1. Understanding the production and consumption of strawberry	DGPER, INERA, DGPV	DGPER organize the workshop to understand the characteristic of strawberry production and consumption to promote the strawberry among stakeholders (INERA, DGPV, Producers and Exporters). DGPER establish the organization of stakeholders of strawberry filière and develop the action plan.
2. Identification of market needs (Survey)	DGPER, MICA	DGPER collect the information of strawberry demands and needs from Diplomatic establishments abroad and CCI-BF. DGPER implement the market survey of sub-regional market by the producers and exporters. The targeted market of survey is take account into desire of stakeholders. While the market survey, collect the information of the operation of export, the required time and packaging needs.
3. Establishment the marketing strategy	DGPER, Producers, Exporters	Based on the analyzed the market needs survey, DGPER organize the workshop and make a discussion among stakeholders (DGPER, INERA, DRARHASA, MICA and CCI-BF). DGPER and stakeholders establish the marketing strategy and action plan of producers and exporters.
4. Improvement of processing, packaging, packing and transportation	DGPER, Exporters, Producers	DGPER supported to implement the activities of stakeholders along with action plan if necessary. The exporters control the quality of fruits for exportation to meets of the market
5. Monitoring and reporting	DGPER	DGPER monitoring the action plan of stakeholders and collected and reporting the information.

5) Implementation Schedule

Table 7.4.2 Schedule of Project for Strengthen Marketing Capacities for Sub-regional Market

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Understanding the production and consumption of strawberry	DGPER, INERA, DGPV	■			
2. Identification of market needs (Survey)	DGPER, MICA		■		
3. Establishment the marketing strategy	DGPER, Producers, Exporters		■		
4. Improvement of processing, packaging, packing and transportation	DGPER, Exporters, Producers		■		
5. Monitoring and reporting	DGPER		■		

6) Expected Effectiveness

Increase the quantity of exportation to the sub-regional market especially to the supermarket of Ghana and Côte d'Ivoire.

(2) Project for Commercialization with Added Value by Producers to the Domestic Market

1) Background and Objective

More than 80% of strawberry sales to the domestic market are by female merchants. The rest proportion of sales is by family of producers. The domestic market is local and it was already established. The female merchants sell on the street stall and street vendor. The strawberry demand from local market is satisfied. The sales quantity to the domestic market could not increase if new market is not prospected. Strawberry is luxury product and main consumer of strawberry in Ouagadougou is supermarket users like a wealthy class people and foreigner. It can be said that commercialization of strawberry should be added value and sales promote to the supermarket. The producers aim to deal with supermarket by added value of strawberry.

This project aims at supporting the producers for commercialization with added value. The activities are done by producers. The conflict with female merchants that sell strawberry in local market should be avoided.

2) Target Area

Target areas are Boulmiougou and Bika in the suburbs of Ouagadougou is the main production area of strawberries in Burkina Faso.

3) Stakeholders and Target Group

Stakeholders: DGPER

Target group: Producers

4) Activities and Actors

This project is implemented mainly by DGPER.

Table 7.4.3 Project for Commercialization with Added Value by Producers to the Domestic Market

Activity	Actor	Contents of Activity
1. Discussion with stakeholders	DGPER	DGPER collect the information of domestic market of strawberry and possibility of new market. DGPER consider the sales promotion activities for added value by producers. DGPER and producers decide the schedule and contents of activities.
2. Activities for sales promotion	Producers, DGPER	DGPER instruct to the producers the way of sales to the supermarket. The producers implement the sales promotion as visit and distribute the sample. DGPER support the sales promotion by producers and demand the advice from MICA and CCI-BF if necessary.
3. Monitoring and concluding	DGPER	DGPER monitoring the activities and reporting the information.

5) Implementation Schedule

Table 7.4.4 Schedule of Project for Commercialization with Added Value by Producers to the Domestic Market

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Discussion with stakeholders	DGPER				
2. Activities for sales promotion	Producers, DGPER				
3. Monitoring and concluding	DGPER				

6) Expected Effectiveness

The realization of sales to the supermarket in the domestic market will be diversification of market. It is expected to increase the quantity of sales to the domestic market.

(3) Project for Selection of the Adaptable Varieties

1) Background and Objective

The strawberry plant in Burkina Faso is used by propagation from long time ago. The productivity of runner plant and production quantity is decreased and quality of fruit is deteriorated year after year. The introduction of new variety that adapted the cultivation in Burkina Faso is urgent issue. The adaptable characteristic of varieties such as adapted cultivation under high temperature, following or improved variety of cultivar and excellent of storage or transportation are select and implemented of cultivation test in the field. Based on the cultivation test, the INERA picked up the adapted varieties and register in official. The INERA establish the list of characteristic of adapted varieties and technical guideline.

2) Target Area

Target areas of strawberry production site are Boulmiougou and Bika in Ouagadougou, Koden and Kounima in Bobo-Dioulasso is.

3) Stakeholders and Target Group

Stakeholders: DGPER, INERA, DGPV and DRARHASA

Target Group: Producers

4) Activities and Actors

DGPER coordinates this project and mainly INERA and producers implement it.

Table 7.4.5 Activities and Actors of Project for Selection of the Adaptable Varieties

Activity	Actor	Contents of Activity
1. Collection of the characteristic of varieties to be introduced	DGPER, DGPV, INERA	DGPER collect the characteristic of varieties to be introduced as new variety in Burkina Faso together with INERA and DGPV.
2. Identification of adaptable characteristic	INERA, DGPV, Producers	Based on the collected characteristic, INERA and DGPV select varieties to be implemented the test in the field. The possibility of cultivation under high temperature, marketing and experience of producers is considered to the selection. INERA request to the nursery company for share the information of varieties if necessary.
3. Implementation of cultivation test in the field	INERA, DGPV, Producers, DRARHASA	INERA implement the cultivation test in the field collaborated with DGPV and producers. The examination of cultivation in the research field of INERA is to be implemented if necessary.
4. Official registration of varieties	INERA	INERA implement the examination for cultivation of varieties to be introduced in the field INERA register the adapted varieties for vulgarization.
5. Establish technical guideline	INERA, DRARHASA	Based on the result of field test, INERA establish the list of adapted characteristic of varieties and technical guideline. INERA request to the nursery company for technical support if necessary.

5) Implementation Schedule

Table 7.4.6 Schedule of Project for Selection of the Adaptable Varieties

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Collection of the characteristic of varieties to be introduced	DGPER, DGPV, INERA,				
2. Identification of adaptable characteristic	INERA, DGPV, Producers				
3. Implementation of cultivation test in the field	INERA, DGPV, Producers, DRARHASA				
4. Official registration of varieties	INERA				
5. Establish technical guideline	INERA, DRARHASA				

6) Expected Effectiveness

The characteristic of adapted varieties in Burkina Faso is identified. The adapted varieties are registered in official by the INERA. The INERA propagated the runner plants of adapted varieties for next renewal. It can realize the regularly renewal of runner plants by producers. It will be improved the productivity.

(4) Project for Introduction of the Forcing Culture

1) Background and Objective

The cultivation calendar in Burkina Faso is same among all producers. At the peak harvest season, the domestic market become full of strawberries and the price is fall down.

It is necessary to advance the harvesting period for shift the peak season of harvest. The control of carbon and nitrogen and prune the roots are the technique of forcing culture. The adapted technique of forcing culture in Burkina Faso is unknown. The implement the test of the forcing culture technique for identifies adaptable technique in Burkina Faso. The vulgarization of forcing culture will be considered based on the result of test.

2) Target Area

Target areas is production site of strawberry is Boulmiougou and Bika in Ouagadougou, Koden and Kounima in Bobo-Dioulasso.

3) Stakeholders and Target Group

Stakeholders: DGPV, INERA, DGPV and DRARHASA

Target group: Advanced producers

4) Activities and Actors

This project is implemented mainly by INERA and producers.

Table 7.4.7 Activities and Actors of Project for Introduction of the Forcing Culture

Activity	Actor	Contents of Activity
1. Training for forcing culture of strawberry	INERA, DGPV, DRARHASA	INERA and DGPV explicate the biology of strawberry and forcing culture to advanced producers for introduces the forcing culture technique in Burkina Faso.
2. Selection of producers	INERA, DGPV, Producers	INERA and DGPV select the producers to implement the field test of forcing culture. INERA develop the schedule of cultivation and explicate to the producers. The test of forcing culture implement in small scale by more than one producer.
3. Field test for technique of forcing culture	INERA, Producers	INERA and advanced producers implement the test of forcing culture in the field for verify the technique.
4. Monitoring and instructing	INERA, DGPV, DRARHASA	INERA, DGPV and DRARHASA conduct the monitoring and give advice the cultivation technique to the producers.
5. Analyzing the result and concluding	INERA	INERA analyze the result of field test and concluding the possibility of forcing culture in Burkina Faso.

5) Implementation Schedule

Table 7.4.8 Schedule of Project for Introduction of the Forcing Culture

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Training for forcing culture of strawberry	INERA, DGPV, DRARHASA				
2. Selection of producers	INERA, DGPV, Producers				
3. Field test for technique of forcing culture	INERA, Producers				
4. Monitoring and instructing	INERA, DGPV DRARHASA				
5. Analyzing the result and concluding	INERA				

6) Expected Effectiveness

The cultivation calendar of strawberry will be plural. It can be alleviated the full of strawberry in the market at the peak season. Moreover, the prolongation of harvesting period is expected to increase the production quantity.

(5) Project for Strengthening of the Secondly Production Area

1) Background and Objective

The quantity of strawberry exportation increases by prospecting for markets in the sub-regional market. It guessed the increase the demand of exportation quantity. The production in Ouagadougou

will not be able to satisfy the demand. In Bobo-Dioulasso, some producers cultivate strawberry in the small scale. They have experience and technique of strawberry cultivation. The number of strawberry producer and quantity of production in Bobo-Dioulasso is decreased by disappeared of runner plants. The introduction of adaptable varieties and improvement the technique of culture is object to the preservation of strawberry cultivation in Bobo-Dioulasso. It is expect to be increase the production quantity.

However, the market demand of Bobo-Dioulasso is little and it is difficult to increase the demand. The increase of production should be considered with prospecting for new markets. The increase of exportation from Bobo-Dioulasso to the sub-regional market can be realized to be increased the quantity of production.

The sub-regional market is demands the improvement of quality of fruit. It is necessary to improve the cultivation technique of producers in Bobo-Dioulasso and develop the system for stable production.

2) Target Area

The target areas are Kodenin and Kounima in the suburbs of Bobo-Dioulasso.

3) Stakeholders and Target Group

Stakeholders: DGPER, INERA, DGPV, DRARHASA and Exporters

Target group: Producers

4) Activities and Actors

This project is implemented mainly by DGPER and INERA.

Table 7.4.9 Activities and Actors of Project for Strengthening of the Secondly Production Area

Activity	Actor	Contents of Activity
1. Selection of target producers	DGPER, INERA	DGPER select the targeted producers among the suburbs of Bobo-Dioulasso together with INERA.
2. Selection and distribution of adapted varieties and cultivation materials	DGPER, INERA, DGPV, DRARHASA	DGPER support to the procurement the runner plants of adapted varieties and cultivation materials. INERA and DGPV select the varieties and advice the cultivation technique to the producers.
3. Training for understanding the characteristic of strawberry market	DRARHASA, INERA	DGPER organize the training of characteristic of strawberry market to the producers. DGPER gave the advice to the producers to understand market needs of sub-regional market and way of meet the needs of them.
4. Exchange of views with producers in Ouagadougou	DGPER, Producers, DRARHASA, INERA	DGPER implement the field visit to Ouagadougou together with DRARHASA. DGPER implement the exchange of view between producers of Bobo-Dioulasso and producers of Ouagadougou.
5. Monitoring and reporting	INERA, DRARHASA	INERA implement the monitoring the strawberry growth and report the monitoring result.

5) Implementation Schedule

Table 7.4.10 Schedule of Project for Strengthening of the Secondly Production Area

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Selection of target producers	DGPER, INERA				
2. Selection and distribution of adapted varieties and cultivation materials	DGPER, DGPV, DRARHASA, INERA				

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
3. Training for understanding the characteristic of strawberry market	DRARHASA, INERA				
4. Exchange of views with producers in Ouagadougou	DGPER, Producers, DRARHASA, INERA				
5. Monitoring and reporting	INERA, DRARHASA				

6) Expected Effectiveness

The technique of strawberry cultivation in Bobo-Dioulasso will be improved and strawberry cultivation can realize the preservation. Strawberry in Bobo-Dioulasso to realized export to the sub-regional markets.

7.4.4 Implementation Structure and Project Cost of the Promotion Plan

(1) Implementation Structure

In the implementation of the promotion plan, DGPER has a role as coordinator of the two programs.

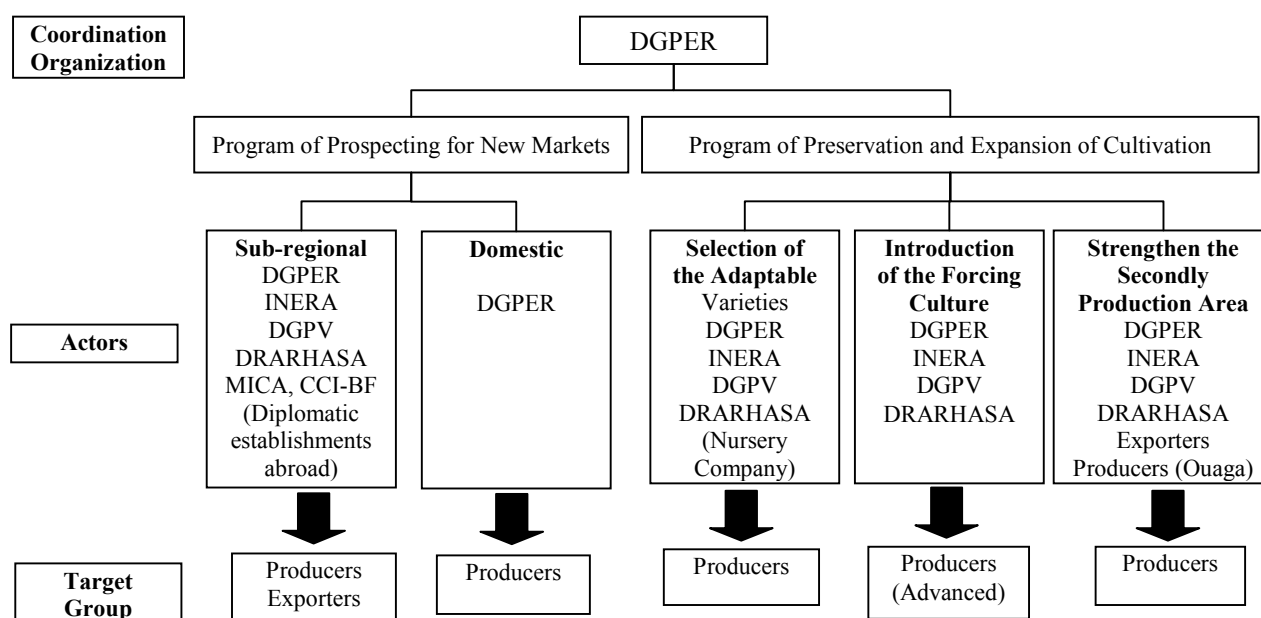


Fig. 7.4.1 Implementation Structure of the Promotion Plan for Strawberry

(2) Important Notices on the Implementation

1) Program for Prospecting for New Markets

The following points are considered for implementation of the program for prospecting for new markets.

- Main implementation actors of this program are DGPER, INERA, DGPV, DRARHASA, producers, exporters, MICA and CCI-BF.
- DGPER collect the market information of sub-regional countries for promotes the exportation of Burkinabe strawberries, it works together with MICA and CCI-BF. DGPER will contact to the diplomatic establishments abroad for collect the market information, if necessary.
- MARHASA consider the support of participation to the exhibition for promotion of

strawberries that is speciality product in Burkina Faso. It will work together with DGPER, MICA and CCI-BF

- d) DGPER will center of actor to organize the training to producer for understanding the luxury product market. In the training will explain the difference of need and promotion activity to the luxury market and local market. Based on the training, the producer will promote strawberries to the luxury market by difference way for local market.
- e) DGPER will supervise the exporter to implement quality control of producer. It aimed to establish the system for supplying the requirement quality product to the market.

2) Program for Preservation and Expansion of Cultivation

The following points are considered for implementation of Program for preservation and expansion of cultivation.

- a) Main implementation actors of this program are DGPER, INERA, DRARHASA, producers, exporters.
- b) DGPER collect the information of strawberry varieties that has possibility to environmental adaption in Burkina Faso. DGPER contact to nursery company to collect the specific information of varieties. Based on the collected information, DGPER and INERA select the adaptable variety to introduce. DGPER and INERA request to the nursery company to give the technical advice for establish the technical guideline, if necessary.
- c) Adapted varieties in Burkina Faso are registration in official by INERA. INERA make up the cultivated varieties list for control the varieties in Burkina Faso.
- d) Project for strengthen the secondly production area will implemented by progress of development new market.

(3) Project Cost

The project costs of promotion plan for strawberry are shown in the table below.

Table 7.4.11 Estimated Project Cost of the Promotion Plan for Strawberry

[Unit: FCFA]

Project	Cost					
	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
1. Strengthening of Marketing Capacities for Sub-regional Market	12,495,000	12,495,000	0	0	0	20,740,000
2. Commercialization with Added Value by Producers to the Domestic Market	2,400,000	3,400,000	0	0	0	2,250,000
3. Selection of the Adaptable Varieties	5,424,000	5,837,500	2,837,500	2,837,500	2,623,500	19,560,000
4. Introduction of the Forcing Culture	2,385,000	4,735,000	0	0	0	7,120,000
5. Strengthening of the Secondly Production Area	5,330,000	4,250,000	350,000	0	0	9,930,000
Total	28,034,000	30,717,500	3,187,500	2,837,500	2,623,500	67,400,000

* Allowance and transportation fee of MARHASA officials and hired staffs are included. Their salaries are not included.

7.4.5 Conclusion

- (a) Strawberries are luxury product. The demands of strawberries in Burkina Faso are limited. The population of middle class in Abidjan and Accra is large. The demands of strawberries are expected to increase by economic growth.
- (b) The productivity of strawberry production is decreased by the deterioration of strawberry plants. The realization of preserved strawberry production should be exchange the new runner plants that import from the nursery company in Europe.

-
- (c) The selection of high quality fruits and packaging can be added value for commercialization. It can discriminate from local market. The added value is expected to sales to the luxury product market in both sub-regional and domestic markets.
 - (d) The fruits film of strawberries is thin. The film of ripened fruit is especially soft and easily to crush the fruit by shock. The intermediate is indicates the proportion of loss is high. The reduction of loss is necessary to improve the adjustment of harvesting period, operation of harvesting, packaging and transportation.
 - (e) The sales to the luxury markets are necessary to collaboration with Exporters. The exporters are expected to control the quality of fruits that to be exported.
 - (f) DGPER is organizer of stakeholders to implement this promotion plan. DGPER is main actor of collection and provide of sub-regional market information.

Chapter 8 Model for Domestic Market: Onion

8.1 Analysis of Present Situation

8.1.1 Target Market

Target markets of onion produced in Burkina Faso are domestic market and neighboring countries' market (mainly Cote d'Ivoire and Ghana).

(1) Flesh Onion

1) Domestic Market

Onion is an indispensable foodstuff and one of the most popular vegetables. The Burkinabe likes Violet de Galmi (purple onion variety) which covers the most part of domestic production. It is presumed that the demand for onions is constant all the year round. Although introduction of rainy season cultivation has been started, dry season cultivation with irrigation is the major cropping type at present. Onions imported (mainly Netherlands and Morocco onions) are major in the market in the off-season of the dry season onions.

i) Domestic Demand / Distribution Quantity

According to FAOSTAT, production quantity of onions (onion (inc. shallots), green) has been around 20,000 tons/year in recent 10 years. However, production quantity of onions estimated in RGA (Recensement Général de l'Agriculture) supported by FAO is 242,258 tons in 2008. According to the study of PAFASP which is a project of World Bank, it is 329,319 tons in 2009. Alienation among the data is much. According to the statistics yearbook of Burkina Faso, the production quantity in 2002 and 2004 was 31,637 tons and 54,959 tons respectively (the production quantities in the recent years are not mentioned). Since the production quantities in 2008 and 2009 mentioned above increased a lot from the quantities in 2002 and 2004, it is assumed that the production quantity tends to increase.

In addition, DRARHASA of Hauts-Bassins region estimated that cultivation area of onions increased from 1,300 ha in 2009/10 to 1,900 ha in 2012 and the production quantity of onions increased by 60% in comparison with the production in 2007¹. Although this information is a case in one of onion production areas in Burkina Faso, it is presumed that the production quantity is increasing after 2008 in whole country.

The onion import quantity, value and unit price of Burkina Faso in the Trade Map are shown below. Total 1,953 tons or 149,000 USD of onions were imported to Burkina Faso in 2012. Although the annual fluctuation of the import is large, around 1,000 to 2,000 tons or around 100,000 to 200,000 USD have been imported in a year. In 2013, 4,686 tons or 283,000 USD was imported to Burkina Faso. It means the amount is increasing. The import from Netherlands and Niger were comparatively large. It is assumed that the onions imported from Niger included onions re-exported to the third countries through Burkina Faso. In addition, it is assumed that the onions imported from Cote d'Ivoire and Ghana were re-exported. The unit price of import from Niger tends to be higher than that from Netherlands. In 2013, the unit price of import from Niger was 78 USD/ton (around 42 FCFA/kg) and that from Netherlands was 53 USD/ton (around 28 FCFA/kg). The data below are almost same as the data of import customs clearance obtained from the customs office of Burkina Faso. However, it is not clear that the data have high reliability and suitably show the present situation of onion import.

¹ BILAN DE LA CAMPAGNE OIGNON, REGION DES HAUTS-BASSINS, 2011 – 2012 (JUILLET 2012)

Table 8.1.1 Onion Import of Burkina Faso

[Unit: Quantity; ton, Value; 1,000 USD, Unit Price; USD/ton]

Exporter		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Netherlands	Quantity	0	0	0		55	0	207	621	451	960	1,242
	Value	0	0	0		3	0	18	50	38	56	66
	Unit Price	-	-	-		55	-	87	81	84	58	53
Côte d'Ivoire	Quantity	4	8	198		29	116	649	884	263	169	69
	Value	0	2	6		1	6	58	37	15	7	2
	Unit Price	0	250	30		34	52	89	42	57	41	29
Ghana	Quantity	0	0	87		20	0	0	0	0	186	364
	Value	0	0	6		3	0	0	0	0	12	22
	Unit Price	-	-	69		150	-	-	-	-	65	60
Niger	Quantity	1,911	331	1,823		877	121	658	696	620	278	1,244
	Value	177	34	161		106	17	146	51	65	35	97
	Unit Price	93	103	88		121	140	222	73	105	126	78
Mali	Quantity	0	0	0		0	0	0	0	10	22	183
	Value	0	0	0		0	0	0	0	3	4	6
	Unit Price	-	-	-		-	-	-	-	300	182	33
Morocco	Quantity	0	0	0		0	0	0	0	0	271	1,181
	Value	0	0	0		0	0	0	0	0	28	65
	Unit Price	-	-	-		-	-	-	-	-	103	55
China	Quantity	0	0	0		0	0	84	29	0	33	227
	Value	0	0	0		0	0	7	2	0	4	15
	Unit Price	-	-	-		-	-	83	69	-	121	66
Other countries	Quantity	0	6	16		0	0	0	0	36	34	176
	Value	0	1	1		0	0	0	0	7	3	10
	Unit Price	-	167	63		-	-	-	-	194	88	57
Total	Quantity	1,915	345	2,124		981	237	1,598	2,230	1,380	1,953	4,686
	Value	177	37	174		113	23	229	140	128	149	283
	Unit Price	92	107	82		115	97	143	63	93	76	60

Source: Trade Map, HS070310 (Onions and shallots, fresh or chilled), Importation statistics from reporting countries (as of December 2014)

There is no estimation of production quantity reflecting present situation. Reliability of data of custom clearance for exportation and importation between neighboring countries seems to be low. Therefore, it is difficult to estimate present consumption quantity (distribution quantity) of onions produced in the country.

ii) Price Fluctuation in a Year

Domestic onions are cultivated with irrigation mainly in dry season. Although there is some difference among regions, the harvest and distribution period are between December and October in next year. DRARHASA of Hauts-Bassins region has understood onion sale activities of producers in the region as follows.²

- December – February: 60% of production is sold to markets at about 100 FCFA/kg
- March – July: 30% of production is sold to markets at about 150 FCFA/kg
- September – October: 10% of production is sold to markets at about 300 FCFA/kg

Consumer price fluctuation of onions in Ouagadougou is shown in the figure below. Shipping time is not adjusted well by the producers based on the demand and supply situation. The price

² BILAN DE LA CAMPAGNE OIGNON, REGION DES HAUTS-BASSINS, 2011 – 2012 (JUILLET 2012)

decreases very much from February to April, that is harvesting time, after that the price goes up. This price fluctuation pattern is clear. The period of the highest price is generally from October to November and the highest price is four or five times of the lowest price (from March to April). Imported onions are also sold in markets in the period of higher price and the price is almost same as the onions produced in Burkina Faso.

The producers know this price fluctuation pattern. Therefore, some producers already started adjusting the shipping time by starting dry season cultivation earlier, cultivating in rainy season, constructing storehouses by support of donors, etc. However, most producers don't have enough knowledge or fund for these countermeasures and the adjustment has not been progressed yet.

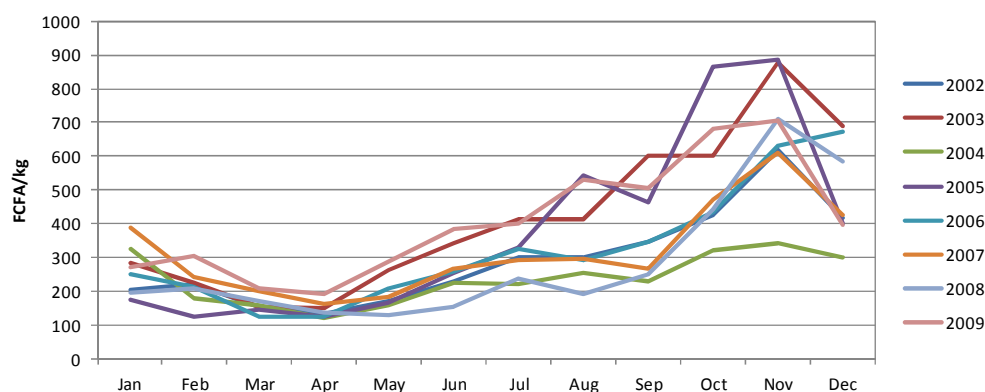


Fig. 8.1.1 Consumer Price Fluctuation of Onion in Ouagadougou (2002 – 2009)

Source: JICA team made based on “Annuaire statistique 2009”, INSD

iii) Situation of Import of Netherlands Onion

Imported onions such as Netherlands onion are supplied for domestic demand in off-season. Not only Burkina Faso but also other countries in West Africa are in the same situation.

Netherlands produces more than one million tons of onions in a year and exports the most onions in the world. The yield (40 – 50 tons/ha) is the highest in the world (FAOSTAT). About 90% of the production quantity is exported. Out of the quantity of export, 30% is to EU, 25% is to member states of former Soviet Union, 25% is to Africa, 10% is to Asia and 10% is to others (Trade Map). The onions are exported throughout the year. Sowing in spring is the most popular cropping type and it is harvested from September to October. Winter onions sown in August are also available. Onion sets planting (storing small onion harvested earlier, planting them in early spring next year and harvesting from July to August) is also popular.

Quantity of export of Netherlands onions to West Africa (ECOWAS) was increased from 122,000 tons in 2003 (EUROSTAT) to about 260,000 tons in 2009 (around double) and it was about 338,000 tons in 2013.

Table 8.1.2 Quantity of Onions Exported from Netherlands to West Africa (ECOWAS)

Destination	2005	2006	2007	2008	2009	2010	2011	2012	2013
Senegal	98,501	75,317	91,796	112,483	124,897	133,339	145,189	132,973	160,915
Côte d'Ivoire	44,867	28,117	26,388	34,428	67,029	64,657	66,187	62,463	77,503
Guinea	23,706	24,450	15,803	26,794	34,232	34,911	36,505	50,498	46,098
Sierra Leone	1,833	931	6,695	7,975	8,998	7,555	10,580	14,252	17,080
Gambia	14,663	11,901	11,677	14,019	12,207	15,823	12,072	12,650	10,972
Mali	1,543	435	1,600	1,190	2,735	4,617	3,968	4,853	8,770
Liberia	3,966	3,990	4,696	4,813	5,512	6,751	5,859	7,587	6,794

Destination	2005	2006	2007	2008	2009	2010	2011	2012	2013
Guinea-Bissau	2,609	2,137	1,746	2,150	3,122	3,174	3,091	3,570	4,085
Ghana	256	219	218	219	436	469	938	1,512	2,388
Burkina Faso	30	-	8	71	397	670	470	1,272	2,335
Cap Vert	2,042	1,870	1,374	1,611	1,796	1,230	1,488	1,154	1,321
Togo	333	34	147	146	277	295	389	274	305
Nigeria	-	-	-	-	-	8	-	-	28
Benin	1	21	-	7	10	32	79	-	-
Niger	-	-	-	-	-	-	-	-	-
	194,350	149,422	162,148	205,906	261,648	273,531	286,815	293,058	338,594

HS Code 070310 Oignons et echalotes, a l'etat frais ou refrigeré, toutes méthodes de transport agrégées (onion and echalote, fresh and refrigeration, all transportation)

Source: EUROSTAT, EXTRA EU trade since 2000 by mode of transport

Burkina Faso and Niger were self-sustaining countries in onion supply in 2006/2007, which were rare countries in West Africa. However, many imported onions such as Netherlands onion are supplied in off-season (July – December) at present. According to the data of Eurostat shown above, Netherlands exported 1,272 tons of onions to Burkina Faso in 2012. However many onions are re-exported from Cote d'Ivoire. About 75% of onions exporting from Netherlands to ECOWAS are shipped from August to January and the quantity is the most in October (shown in the figure below). It takes 3 to 4 weeks to distribute to the markets and the quantity supplying to the markets is the most from November to December.

The figure below shows that Cote d'Ivoire (Abidjan port) imports Netherlands onion throughout the year. The quantity of import is the least from January to May which is harvest season of onions in Burkina Faso.

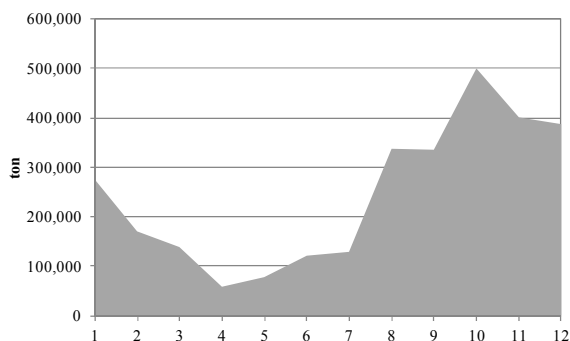


Fig. 8.1.2 Monthly Quantity of Onion Exported from Netherlands to ECOWAS (2012)

Source: EUROSTAT

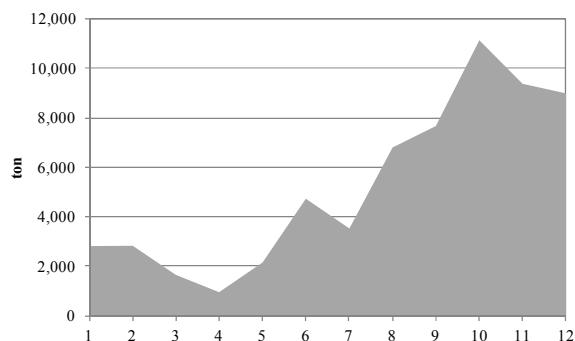


Fig. 8.1.3 Monthly Quantity of Onion Exported from Netherlands to Cote d'Ivoire (2012)

Source: EUROSTAT

2) Neighboring Countries' Markets

According to FAOSTAT, around 2 million tons of onions were produced in West Africa. This quantity was around 2% of onions produced in the world (2011). Nigeria is the country producing the most quantity of onion in West Africa and the production is around 1.2 million tons in a year. Secondly, Niger produces around 370,000 tons.

Production quantity and distribution period in Burkina Faso and the neighboring countries are shown below.

Table 8.1.3 Distribution Period and Production Quantity of Domestic Onions in Burkina Faso and Neighboring Countries

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Production
Burkina Faso													329,319 tons*
Côte d'Ivoire													ND
Ghana													120,000 tons
Niger													371,986 tons
Mali													42,000 tons
Benin													16,000 tons
Nigeria													1,238,090 tons

Source: Production quantity; FAOSTA 2011. * is referred to PAFASP (World Bank)

Distribution period; "Analyse des chaines de valeur ajoutée des filières agro-sylvo-pastorales" PAFASP, 2011

i) Onion Export from Burkina Faso to the Neighboring Countries

According to onion wholesalers in Ouagadougou, Koudougou and Bobo-Dioulasso and onion producers in Korsimoro and Mogtedo, onions produced in Burkina Faso are exported mainly to Cote d'Ivoire, Ghana and Togo.

The data of onion export of Burkina Faso obtained from the Trade Map are shown in the table below. As well as the import data, the data provided by the Directorate of Customs of Burkina Faso are almost same and the annual fluctuation of export is large. Although 17,172 tons or 1,084,000 USD of onions were exported in 2012, around 1,500 tons of onions were exported in some years. The unit price fluctuates much among the import countries and it does not show clear trend. However, it is not clear whether the data suitably show the export.

According to onion wholesalers, most onions are exported to Cote d'Ivoire and oversupplied from January to April. In 2012, onions were oversupplied from Burkina Faso to Cote d'Ivoire and the price in Abidjan market was lower than that in Ouagadougou for short term.

Table 8.1.4 Onion Export of Burkina Faso

[Unit: Quantity; ton, Value; 1,000 USD, Unit Price; USD/ton]

Importer	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Côte d'Ivoire	Quantity	72	1,427	25		508	4,740	936	0	293	16,394	7,956
	Value	1	58	3		27	590	57	0	26	893	415
	Unit Price	14	41	120		53	124	61	-	89	54	52
Ghana	Quantity	12	0	72		75	673	38	65	0	28	300
	Value	1	0	8		22	116	10	18	0	8	6
	Unit Price	83	-	111		293	172	263	277	-	286	20
Togo	Quantity	10	0	15		92	0	0	34	750	750	750
	Value	1	0	1		13	0	0	8	191	183	182
	Unit Price	100	-	67		141	-	-	235	255	244	243
Benin	Quantity	0	0	0		0	0	0	0	191	0	17
	Value	0	0	0		0	0	0	0	301	0	11
	Unit Price	-	-	-		-	-	-	-	1,576	-	647
Other countries	Quantity	0	7	0		992	0	0	0	0	0	67
	Value	0	2	0		123	0	0	0	0	0	11
	Unit Price	-	286	-		124	-	-	-	-	-	164
Total	Quantity	94	1,434	112		1,667	5,413	974	99	1,234	17,172	9,090
	Value	3	60	12		185	706	67	26	518	1,084	625
	Unit Price	32	42	107		111	130	69	263	420	63	69

Source: Trade Map, HS070310 (Onions and shallots, fresh or chilled), Exportation statistics from reporting countries (as of December 2014)

According to some onion wholesalers, Togo market is saturated immediately with imported onions (drop in price) since the urban population is small. Benin seems to have an import control and cross-border trade is difficult.

ii) Onion Export from Niger to the Neighboring Countries

Niger is the largest onion export country in West Africa and exporting 8 to 10 tons/year to neighboring countries including Burkina Faso. However, exact quantity of the export is uncertain. Niger is a competitor of Burkina Faso in markets in Cote d'Ivoire, Ghana and Togo³. Although the export quantity to Burkina Faso increased much in 2013, it presumably included re-export to Cote d'Ivoire and Ghana.

Table 8.1.5 Quantity of Onions Exported from Niger

Export Destination	2007	2008	2009	2010	2011	2012	2013
Burkina Faso	1,215	166	771	2,607	155	218	61,655
Côte d'Ivoire	17,162	20,779	7,930	8,013	5,607	8,949	403
Ghana	35,913	42,717	34,538	30,496	31,973	55,399	15,874
Togo	1,278	2,048	1,371	1,302	1,383	4,482	4,223
Benin	5,481	7,998	2,632	3,866	3,802	15,225	11,671
Nigeria	688	905	725	536	283	849	413
Algeria	61	420	215	475	25	451	5
Mali	76	0	10	0	0	0	0
Other countries	10	30	58	20	70	0	150
Total	61,884	75,063	48,250	47,315	43,297	85,572	94,393

HS Code 070310 Oignons et échalotes, à l'état frais ou réfrigérés
Source: Exportation statistics from reporting countries (Trade Map)

iii) Onion Import from Outside of the Sub-Region

As shown in the Table 8.1.2, markets of the sub-region and the neighboring countries are importing onions from Netherlands, as well as the domestic markets. Especially, import quantity of Senegal, Cote d'Ivoire and Guinea are large. In addition, monthly import quantities of Netherlands onions in 2013 are shown in the figure below. As same as Cote d'Ivoire shown in the Fig. 8.1.3, the import quantity increases from August to January in Senegal. Therefore, onions are imported from outside of the sub-region from August to January or off-season of onion produced in the sub-region although there are onion export countries such as Burkina Faso and Niger in the sub-region.

³ A document of Government of Niger (RECA) mentioned that "Competitors of Nigerian onion are Netherlands and Burkina Faso onion."

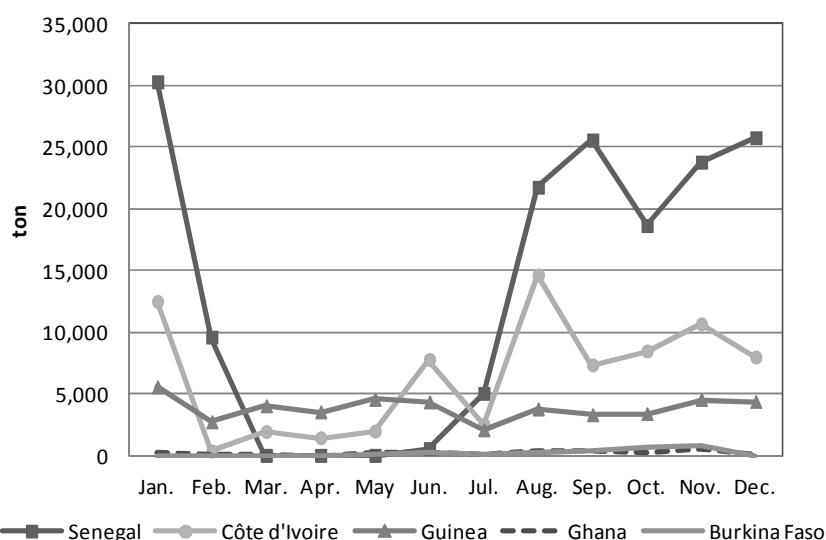


Fig. 8.1.4 Quantity of Onion Exported from Netherlands by Month (2013)
Source: EUROSTAT

iv) Cote d'Ivoire Market

According to interviews in Abidjan, onion production in Cote d'Ivoire is very little and Cote d'Ivoire onion is not distributed to the markets. On the other hand, onions are imported from Burkina Faso, Niger, Netherlands, Morocco, etc. and distributed to the markets.

In case of Cote d'Ivoire, quantity of onions distributing to the markets is more from February to April and the price is decreased. After that, the quantity is decreased and the price is increased. Distribution quantity of both of Niger and Burkina Faso onions seems to be decreased from June to July. When quantity of onion distributing from neighboring counties is little, Netherlands onions (white and purple) are distributed. However, Ivorian preference is for African onions rather than Netherlands onions. In addition, onions are not stored in Cote d'Ivoire and onions imported are immediately distributed to markets.

Burkina Faso onion is generally spicier and can be kept longer than Niger onion. Therefore, Burkina Faso onion is preferred. However, Niger onion is bigger and this is advantage. Although price in production area of Niger onion is lower than that of Burkina Faso onion, prices of both onions are almost same in Abidjan since Niger onion needs higher transportation cost than Burkina Faso. Therefore, Burkina Faso and Niger onions seem to be rivals in Cote d'Ivoire.

According to sellers in Cote d'Ivoire, they have experience to sell rainy season onions; Alize and Julio. And Alize is preferred rather than Julio because of the color and taste.

v) Ghana Market

According to interviews in Accra, it is said that about 50% of onions in Ghana market are imported onions. The imported onions are mainly produced in Niger and the onions are imported from Niger throughout the year. On the other hand, Burkina Faso onion is imported and distributed from December to June.

Price of onions is the lowest from March to May and the highest from December to January. Market prices of onions in Ghana in 2012 and 2013 are shown in the figure below.

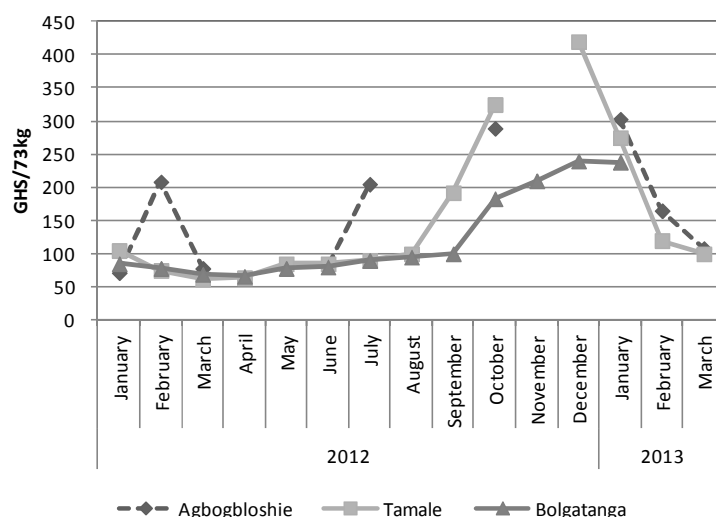


Fig. 8.1.5 Price Fluctuation of Onions in Ghana

Source: Ghanaian Ministry of Agriculture

In Ghana market, both of Niger and Burkina Faso onions are available. However, quantity of onions imported from Niger is more than that from Burkina Faso and Niger onion holds a dominant position. Although reasons that Niger onion holds a dominant position are not clear, it seems to be one of the reasons that Hausa tribe who is in Niger is also in Ghana. Many of them are working as wholesalers in Ghana and have relation with Nigerian from long ago⁴. On the other hand, it is said that Burkina Faso onion is preferred since it is spicy and has strong smell.

(2) Dried Onion

The most popular processed product of onions is dried onions. Dried onions are one of indispensable seasonings for traditional food in Burkina Faso such as sauce and soup. How to make the dried onions (Oignon Séché) is just to cut and dry onions by sunshine. They are called “Djaba Kouèga” in Móoré language and “Jaba Djani” in Jula language. They are sold in markets as well as other seasonings. Dried onions produced in Mali are popular in market and they are sold not only in Bobo-Dioulasso but also in Ouagadougou. Price of the dried onions produced in Mali is about 1,000 FCFA/big-bag.

Fried onions (oignon fri) are made by frying the dried onions produced in Mali and mixing with tomato powder. The fried onions are called “Djaba Kiimé” in Móoré language and “Jaba Yilani” in Jula language. The fried onions are processed by sellers and sold in small bags (50FCFA/bag).

In Korsimoro in which onions are produced well, onions are harvested much and some part of them cannot be preserved in storages in harvest season. Therefore, the producers have produced and sold dried onions since around 10 years ago. Although the production quantity of dried onions is not clear, a collector purchases about 1.5 tons of dried onions in a year. The dried onions purchased are exported to Cote d’Ivoire through traders in Ouagadougou. However, dried onions in generally are produced from onions which are not sold since they are too small or damaged in storehouses. And onions are not produced specially for the dried onions. It means that the dried onions are by-products for effective usage of onions which cannot be sold in fresh.

⁴ Stratégie nationale de promotion des exportations (SNE)



It is mentioned in the study report of USAID (2008)⁵ that fresh onions are preferred in West Africa and the study could not find evidence suggesting market potential for dried onions. In case of market survey in Ghana and Cote d’Ivoire in the Project also, dried onions selling in markets are very few or none. Therefore, potential of dried onions in the markets is low.

8.1.2 Cultivation/Production

(1) Production Area

Cropping area of onions in Burkina Faso is 13,390 ha⁶ (2009-2010). It accounts for about 40% of cultivation area of vegetables. Although the onions are produced in whole country, 4 regions; Boucle du Mouhoun region (3,700ha), Nord region (2,000ha), Centre-Nord region (1,520ha), Centre-Ouest region (1,630ha)⁷, are major producing areas of dry season onion.

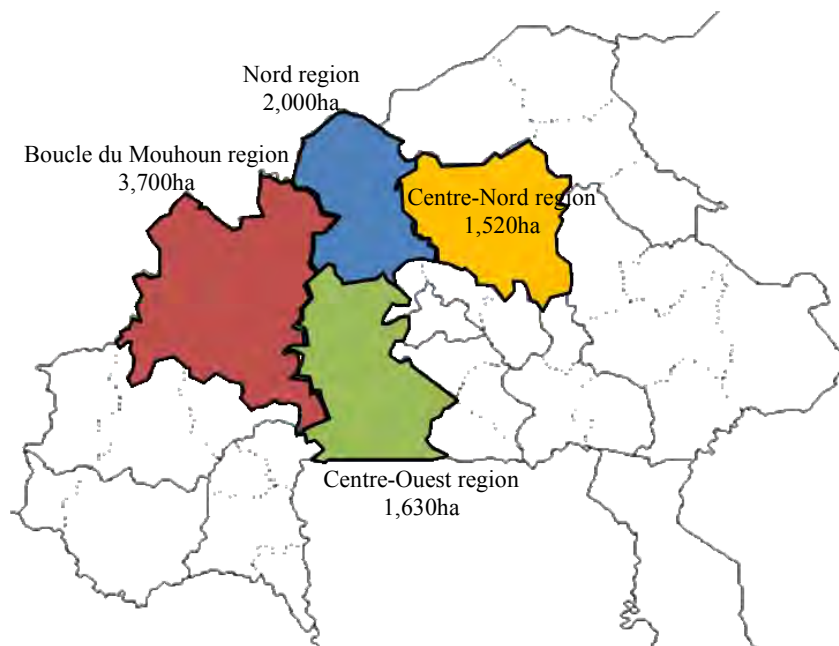


Fig. 8.1.6 Major Producing Areas of Onion in Dry Season

The onions are produced by small scale vegetable producers and the cropping area of onion of each producer is around 0.05 to 1 ha.

⁵ WEST AFRICA ONION/SHALLOT TRADE, Prospects for Value Chain Development, Sep. 2008

⁶ PAFASP 2013

⁷ PAFASP 2013

Although data of cropping area and production of onion in rainy season are not available, the producers exist in Sanmatenga province, Sanguié province, Yatenga province, Sourou province, etc. Their production scale are less than one ha each.

(2) Production Quantity

According to the data of World Bank (PAFASP), production quantity of onions is 329,319 tons⁸ (2009/2010) and it accounts for 43% of production quantity of all vegetables. Burkina Faso is the fourth country⁹ in onion production in West Africa followed by Nigeria, Niger and Senegal. Production quantity of onion in dry season in 4 regions; Boucle du Mouhoun region (121,150 tons), Nord region (49,950 tons), Centre-Nord region (36,030 tons) and Centre-Ouest region (24,245 tons), accounts for 70% of total production quantity of onions in dry season. The production quantity of onions increased ten times from 2003 to 2010.

Average yields in Korsimoro are from 23 tons/ha (variety: Violet de Galmi) in dry season¹⁰. While the yield is around 20 tons/ha in Burkina Faso, it is 34.7 tons/ha¹¹ in Niger and there is a big difference.

(3) Cropping Type and Land Use

Although dry season cultivation is a major cropping type for onion, rainy season cultivation has been also tried since 3 years ago. Cultivation condition in dry season is under pump irrigation, small scale irrigation scheme, downstream of barrage or bas-fonds¹². Cultivation condition in rainy season is under pump irrigation or small scale irrigation scheme, since the cultivation sometimes needs irrigation at the beginning and end of rainy season.

1) Cultivation in Dry Season

In case of cultivation in dry season, seedlings are generally grown from September to October and transplanted to fields from October to November. Mainly, they are harvested from January to April. The peak harvest season is from March to April. The general cropping schedule of the dry season cultivation is shown below.

Table 8.1.6 Cropping Calendar of Dry Season Onion

Work item	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Seedling												
Transplanting												
Harvesting												
Storing												

Source: INERA fiche technique de l'oignon

In case of cultivation in dry season, irrigation facilities are necessary. Markets are saturated with onions in the peak harvest season and the price falls. Therefore, some producers start the cultivation in dry season earlier to harvest in the high price season and to get more profit. For example, some producers of dry season onion in Mogtédou are trying to harvest in December. However, this cropping type has a risk such as much rain in the beginning stage of the cultivation.

2) Cultivation in Rainy Season

In case of cultivation in rainy season, seedlings are grown from May to June, and transplanted to fields from June to July. They are harvested from October to November. This cropping type

⁸ PAFASP 2013

⁹ Analyse des chaînes de valeur ajoutée des filières agro-sylvo-pastorales, Mars 2011

¹⁰ Result of interview to UDGPM/K by the Study team

¹¹ West Africa Onion/Shallot Trade September 2008

¹² Analyse des chaînes de valeur ajoutée des filières agro-sylvo-pastorales, Mars 2011

harvests onions in off-season of cultivation in dry season. The general cropping schedule of the rainy season cultivation (variety: PREMA178) is shown below.

Table 8.1.7 Cropping Calendar of Rainy Season Onion

Work item	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Seedling												
Transplanting												
Harvesting												

Source: Essais varietaux pour l'introduction de nouvelles varietes d'oignon pour la culture d'hivernage au Burkina Faso. Campagne d'hivernage 2010, ATP USAID/INERA

Generally, producers grow rice, cotton, sorghum, maize, peanut, etc. in rainy season. Therefore, they have to manage their works and allocate agricultural inputs among these crops and the onions if they cultivate the onions in rainy season. The onion cultivation in rainy season also needs supplemental irrigation in the period of non-rain.

Although the seeds of onions for dry season are produced in Burkina Faso and sold, that for rainy season are imported and sold by seed supply companies. In case of PREMA178, 20 bags of seeds are required for one ha and one bag of the seed is 5,500 FCFA.

(4) Cultivation Variety

1) Variety for Dry Season Cultivation

In the catalog of agricultural crops and varieties of Burkina Faso, following 8 varieties of onion are mentioned.

Table 8.1.8 Major Varieties of Dry Season Onion

Name of Variety	Cultivation Period	Color	Others
12BF/FBO1	140-150	Purple	Purebred variety
11BF	140-150	White	Purebred variety
10BF	140-150	Purple	
FBO4	140	-	
FBO5	150	Yellow	
FBO6	140-150	-	Purebred variety
FBO7	140-150	-	
Violet de Galmi	150	Purple	

Source: Comité National des Semences, "CATALOGUE NATIONAL DES ESPECES ET AGRICOLES DU BURKINA FASO" 2014

The most cultivated variety in Burkina Faso is Violet de Galmi. Violet de Galmi originally came from Galmi area in Niger. Its taste is spicy. Its bulb is big and the yield is high. And also this variety is suitable for storage. The seeds are produced in Burkina Faso. Violet de Galmi is a variety for cultivation in dry season and it cannot grow under a condition that it is much rain and high humidity.

In addition, local varieties such as Violet de Garango, Violet de Soumarana and Blanc de Tarna are cultivated in Burkina Faso¹³. However, details of the production are not clear.

¹³ Potentiel économique des nouveaux et anciens produits agricoles et forestiers au Sahel, Juillet 2009

2) Variety for Rainy Season Cultivation

Onion cultivation in rainy season has been examined by using varieties for dry season in West Africa since 1980s with increase of onion consumption. However, it has not fixed since the variety for dry season are not adapted to rainy season. In case of Burkina Faso, varieties for the rainy season cultivation (PREMA178, ALIZE and JULIO) has been introduced. Verification of local adaptability and establishment and extension of the cultivation system has been needed.

Table 8.1.9 Major Varieties of Rainy Season Onion

Variety	Cultivation Period	Color	Others
PREMA178	140-150	Purple	PREMA178 was developed by East West Seeds Company in Thailand. It was the most suitable variety for the rainy season cultivation in a variety test conducted by USAID and INERA. It was introduced to some major onion cultivation areas.
ALIZE	140- 150	Purple	ALIZE was developed in Senegal by Technisem, which is a seed company in France, and released in 2012. It is suitable for storage.
JULIO	150-160	Red Purple	JULIO was developed in Senegal by Technisem, which is a seed company in France, and released in 2012. Its color is deeper than that of Violet de Galmi. The taste is sweeter than Violet de Galmi. Possible period of storage after harvest is short.

Source: Interview by JICA team and catalog of Technisem

Advantages of the onion cultivation in rainy season are that the problem of water and pests and diseases are less. In addition, the products can be sold when market price is high.

3) Preference of Onions of Burkinabe

According to onion producers, Burkinabe may like light purple onions such as Violet de Galmi. Some producers in the pre-pilot activity in the Project do not like JULIO, variety for the rainy season cultivation, because it is deeper purple than that of PREMA178 and ALIZE.

According to onion sellers, Burkinabe likes local onions most (light purple varieties such as Violet de Galmi). In case of imported onion, purple onions produced in Morocco are preferred to white onions produced in Netherlands. However, purple onions produced in Morocco have much juice and sweeter taste. Since local onions such as Violet de Galmi are spicy, Burkinabe may prefer the local onions.

8.1.3 Value Chain

(1) Trade Chain

The trade chain of onions produced in Burkina Faso and works of each actor are shown in the figure below.

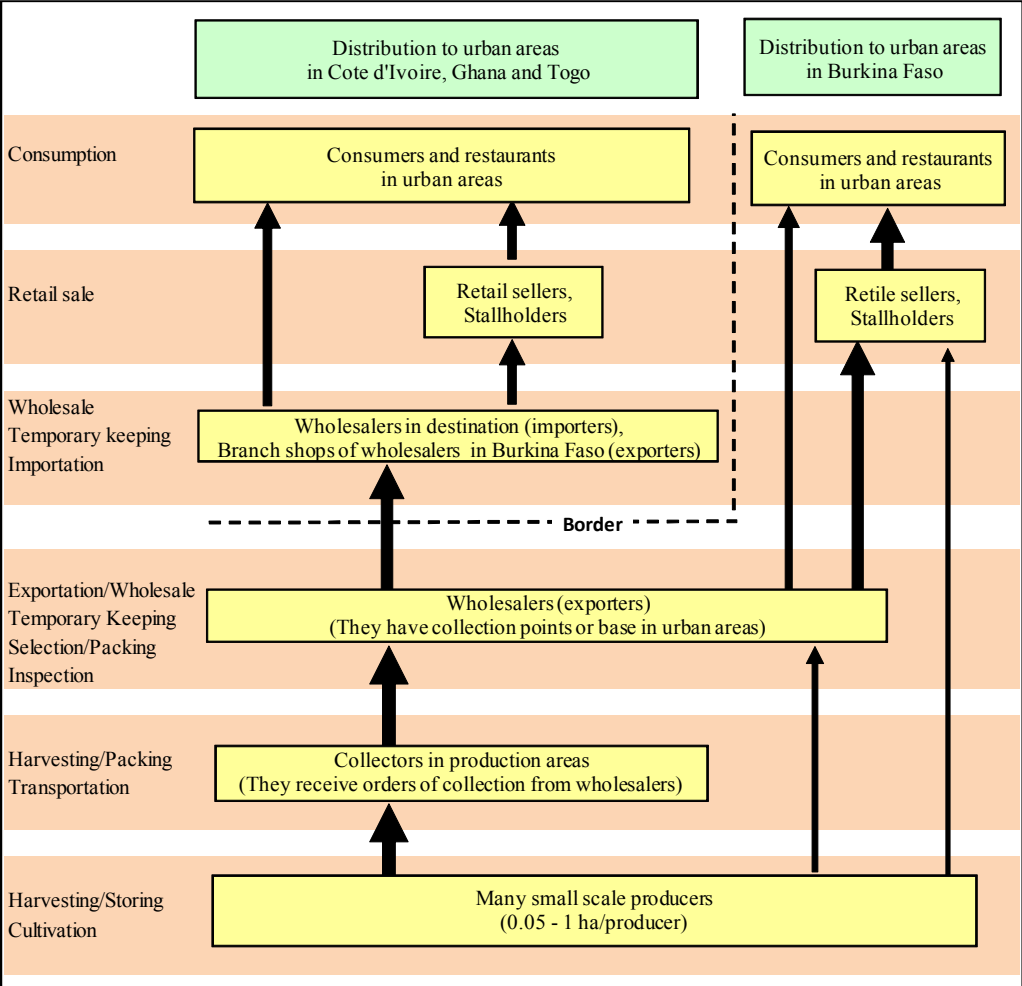


Fig. 8.1.7 Trade Chain of Onions Produced in Burkina Faso

Source: JICA team made based on interviews

After producers harvest onions, collectors in production areas buy the onions from the producers and transport to relay points. At the relay points, the onions are sold from the collectors to wholesalers. The wholesalers transport the onions to consumption markets in Burkina Faso and neighboring countries and sell to retail sellers or wholesalers in destinations.

In the trade chain, producers store and wholesalers select and pack the onions. The onions are relayed in some cities near the production areas. Koudougou, Bobo-Dioulasso, Ouahigouya, Sourou, Yako and Ouagadougou are the important points.

The price is decided by bag unit in the all trade stages that are from collection in production areas to retail sale. The trade is based on personal networks among the collectors in production areas, wholesalers (exporters) and wholesalers in destination (importers). The all trades are spot trades.

(2) Producers

Although producers sell their products in their fields, gardens or local markets, most producers sell

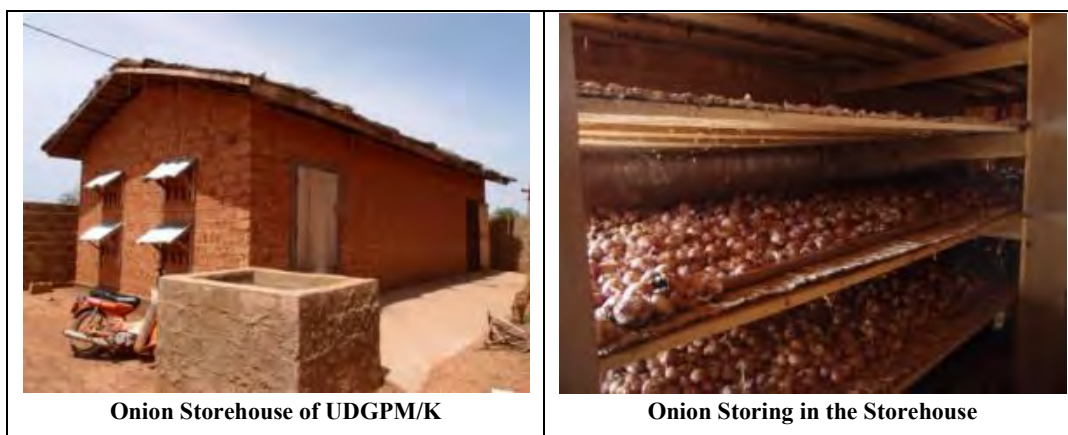
their products in their fields. Producers individually sell the onions. Producers and collectors in production areas harvest and pack the onions. Some parts of the onions are stored by producers and sold when the price is high.

1) Storage

According to documents and interview with producers, 30 to 50% of domestic production quantity is lost by traditional storage method in the period of high temperature from April to June and subsequent period of high humidity. In addition, it is difficult to store after June.

However, it is possible to decrease percentage of the loss and to extend the storage period, if onions are stored in a new type storehouse (shelf type or hut type) supported by PAFASP. According to interview in Koudougou, the hut type storehouses established by support of PAFASP can keep onions for 4 months, from April to July, although traditional storehouses can keep onions for 3 months.

In Korsimoro, most of producers who are members of union of vegetable producers (UDGPM/K) produce onions and UDGPM/K has an onion storehouse. This storehouse was built by their fund and it is a same type storehouse (shelf type) as PAFASP. They have experiences to keep onions in the shelf type storehouse¹⁴ until September. If the onions are kept on floor, the loss is about 50 %. However, the loss is almost none, if the onions are kept on the shelf.



Onion Storehouse of UDGPM/K

Onion Storing in the Storehouse

(3) Traders

Traders consist of collectors in production areas and wholesalers (exporters). The collectors in production areas buy onions from producers and transport to relay points and sell to the wholesalers. The wholesalers (exporters) transport them to urban markets in Burkina Faso or in the neighboring countries after selection and packing of the onions in the relay points.

The collectors in production areas work in each production area and some collectors are producers. The wholesalers are individual traders and they do not have a large storehouse and a shop. The wholesalers do not feel big difference between exporting to neighboring countries (especially to Cote d'Ivoire) and transporting to urban areas in Burkina Faso. A traders association in Bobo-Dioulasso, near the border of Cote d'Ivoire, has a sales base in Abidjan. A representative of the association stays in the base to sell and collect money.

1) Selection and Packing

The collectors in production areas tend to buy relatively equal onions by field units to avoid big loss and trouble. Therefore, generally onions are not sorted based on size although only very small

¹⁴ Cost of construction was 3.5 million FCFA (floor space: 11m x 5.5m)

onions are removed in fields.

According to wholesalers (exporters) in Koudougou, they check whether there are very small or damaged onions after buying from collectors in production areas and then repack for export. The repacking is mainly for unifying the packing style and not for sorting by size or quality. However, according to wholesalers in Bobo-Dioulasso, packing for exportation is done in fields. Jute bags (diversion of bags for cacao or cashew) are used for the repacking done by the wholesalers (exporters) and weight of one bag is 120 to 130 kg/bag after the repacking.

The net bags are already used for sales of domestic onions in urban areas and distribution of onion imported from Europe. Although the net bags (30 – 35 kg/bag) had been imported, Faso Plast Company in Burkina Faso started producing and selling it.



Repacking of onions in a collection and shipping facility (Koudougou)



Packed onions for export (Yako)

2) Facilities for Collection and Relay

Markets, open spaces, etc in urban areas are used for relay points. There is a developed market for vegetables and fruits (urban market) in Bobo-Dioulasso. In addition, collection facilities were developed by the support of PAFASP in Koudougou. They have been operated for onion trade.

(4) Retail Sellers

There is no wholesale market for fresh agricultural products (facilities for collection and division of products in urban areas). Several markets (gathering small-scale retail sellers) existing in urban areas are taking on such role. Almost all of retail sellers of agricultural products are women and there is no large-scale retail seller. Generally, 30kg of bag is used for retail of onions. System of division of the products in urban areas in the neighboring countries may not be so different from that of Burkina Faso.

(5) Production Cost of Onion in Dry Season

Production cost per hector of onions in dry season is shown in the table below. The cost was estimated based on interview with producers in Korsimoro. Cost of chemical fertilizers and fuel for irrigation pump account for high percentage in the production cost and it is about 80% in both costs. If products are sold in harvest season (yield: 23 ton/ha, selling price: 120 FCFA/kg), the gross profit is about 1,213,000 FCFA/ha.

Table 8.1.10 Case of Production Cost of Onion in Dry Season (per ha)

Item	Cost	
	FCFA	%
Seed	75,000	4.8
Mulch for nursery	12,000	0.8
Manure	100,000	6.5
Labor	100,000	6.5
Chemical fertilizers	660,000	42.7
Pesticides	20,000	1.3
Fuel for irrigation pump	580,000	37.5
Total of production cost	1,547,000	
Sales per ha	2,760,000	
Gross profit per ha	1,213,000	

(6) Value Chain of Onion Exported to Abidjan Market

Value chain of Burkina onion exported to Abidjan market in February or March 2013 was estimated based on interview with wholesalers in Koudougou and wholesale market in Abidjan. Result of the estimation is shown in the table below.

Although added value of wholesaler (exporter) is high, the wholesaler (exporter) takes on roles of buying the onions from collectors in production areas in a relay point, repacking and transporting to Abidjan. Therefore, the cost is also high. The cost of selection and repack (including loss) is roughly 2,150 to 2,350 FCFA/120kg and transportation to Abidjan by a truck is roughly 5,000 FCFA/120kg. The gross profit of wholesaler (exporter) is 2,650 to 2,850 FCFA/120kg bag (22 - 24 FCFA/kg) so that it is not excessive margin.

Table 8.1.11 Case of Value Chain of Burkina Onion Exported to Abidjan Market

	Selling Price (FCFA/kg)	Added Value (FCFA/kg)	Rate of Added Value in the Selling Price
Wholesaler in Destination	333	42	12.5%
Wholesaler (Exporter)	292	83	25.0%
Collector in production area	208	48	14.5%
Producer	160		

8.1.4 Formulation of Organizations in the Value Chain

By guide of the World Bank project (PAFASP), following CIFOB, UNAPOB and APCOB were formulated as national level organizations and registered in September 2011. According to interview with the organizations, each organization collects membership fee from the members and holds general assembly. However, and their offices and staffs are not arranged yet since the period after the formulation is still short. Actually, the organizations exist as windows of the sector and take on roles of connecting and coordinating the members.

(1) Inter-profession Organization: Comité Interprofessionnel de la Filière Oignon du Burkina (CIFOB)

CIFOB is a national level inter-profession organization of onion. The two organizations below are the members. Objective of CIFOB is to improve competitiveness of the onion value chain in Burkina Faso through dialogues with concerned organizations of production and trading. Major roles of CIFOB are the followings.

- Representing and defending the onion value chain in Burkina Faso by taking on a role of

intermediate between actors of the onion value chain and others

- Providing tools and activities to promote research, training, support, simplification of procedures, etc
- Promoting and managing agreements between different professions of the onion value chain in Burkina Faso
- Promoting and improving quality of the onion value chain in Burkina Faso
- Promoting dialogues between different professions of the onion value chain in Burkina Faso
- Collecting information and data regarding the members and monitoring

(2) Producers Organization: Union Nationale des Producteurs d'Oignon du Burkina (UNAPOB)

Objective of UNAPOB is to increase quality and quantity of Burkina onion production and to meet demand of markets. Major roles of UNAPOB are the followings.

- Representing and defending the producers unions
- Promoting communication among the unions
- Strengthening the professionalization
- Increasing and extending onion production
- Supporting producers

Members of UNAPOB consists of producers unions in provincial level and 15 unions below are members (as of January 2014).

Table 8.1.12 Members of UNAPOB

	Name of Union	Place	Number of Commune Admitted
1	UPPO à Yatenga	Ouahigouya	6
2	UPPO à Loroum	Titao	4
3	UPPO à Houet	Faraman	4
4	UPPO à Zoundoma	Gourcy	5
5	UPPO à Passoré	Yako	3
6	UPPO à Sourou	Tougan	2
7	UPPO à Oubritenga	Ziniare	7
8	UPPO à Zoundwéogo	Zoundwéogo	4
9	UPPO à Sanmatenga	Kaya	4
10	UPPO à Boulkiemdé	Koudougou	7
11	UPPO à Bam	Bam	4
12	UPPO à Ganzourgou	Mogtedo	3
13	UPPO à Gourma	Fada-N'Gourma	2
14	UPPO à Boulgou	Garango	3
15	UPPO à Kompienga	Kompienga	1

* UPPO: Union Provinciale des Producteurs d'Oignon
Source: JICA team made based on interview.

(3) Traders Organization: Association Professionnelle des Commerçants d'Oignons du Burkina (APCOB)

Objective of APCOB is to contribute general development of onion traders in Burkina Faso. Major

roles of APCOB are the followings.

- Promoting professionalization
- Developing abilities of the traders
- Confirming their activities
- Extending onions
- Representing onion traders
- Promoting dialogues

APCOB consists of 8 traders organizations below that are established in distribution points of onions. APCOB is collecting price information of onions and providing the information to traders who ask the information.

Table 8.1.13 Member of APCOB

	Name of organization	Place	Number of members	Established year
1	AEFOB	Ouagadougou	50~60	2009
2	AEOB	Koudougou		
3	ZEMS TAABA	Koudougou	100	1997
4	NONG TAABA	Bobo-Dioulasso	180	2001
5	TEGA WENDA	Bobo-Dioulasso		
6	BEONERE	Ouahigouya	12	2008
7	GNONGON DEMIN	Sourou	17	2011
8	PENG D WENDE	Yako	30	2006

AEFOB : Association des Exportateurs de la Filiere Oignon du Burkina
Source: JICA team made based on interview

8.1.5 Support Projects by Other Donors

(1) World Bank

The World Bank and MARHASA are implementing PAFASP since 2006 that includes onion in the target crops. Although PAFASP was started in December 2006 as 6 years program, the implementation period was expanded until 2014. In addition, the second phase is implemented until 2016. Project The budget is 84.5 million USD in total and 66 million USD of it is loan of the World Bank. The target areas are 9 regions; Centre-Ouest region, Centre-Sud region, Plateau Central region, Nord region, Centre-Nord region, Sahel region, Boucle du Mouhoun region, Cascades region and Hauts-Bassin region. The supports regarding onions are mentioned below.

- Support of establishing onion storehouse
- Support of establishing facilities for collection and market (comptoirs)
- Support of developing small scale irrigation
- Support of formulating organizations in the onion value chain (see “8.1.4 Formulation of Organizations in the Value Chain”)

Support of establishing onion storehouse is implemented for producers or unions of producers. Number of the storehouse established is shown below by region.

Table 8.1.14 Number of Storehouse Established by Support of PAFASP

Region	Storehouse (Shelf type)	Storehouse (Hut type)
Centre-Nord	27	11
Nord	29	111
Sahel	8	0
Hauts-Bassins	17	0
Cascade	13	0
Boucre du Mouhoun	30	0
Centre-Ouest	10	37
Prateau-Central	10	28
Centre-Sud	15	73
Centre	0	0
Total	159	260

Source: Made by JICA team based on interview with PAFASP (as of November 2013)

According to producers, the construction cost of a shelf type storehouse is from 4,000,000 to 7,000,000 FCFA and that of hut type storehouse is about 700,000 FCFA. Beneficiaries need to defray 20 to 25% of the cost. Capacities of the shelf type and hut type storehouses are about 15 to 20 tons and 2.5 to 4 tons, respectively. According to the mission of PAFASP in May 2012, capacity of onion storage in Burkina Faso was more than 5,000 tons.

Regarding establishment of facilities for collection and market (comptoirs), it is planned that facilities for onion, tomato, haricot and potato are established. The facilities are established in 6 places; Koudougou, Korsimoro, Niamssa, Yako, Ouahigouya and Mogtedo. The facilities in Koudougou were completed and that in other places are under plan or construction (as of September 2013). The operating facilities in Koudougou were requested by onion traders' organization in Koudougou (Zems Taaba). The facilities are managed by the onion traders' organization and used only for onions.

Regarding support of developing small-scale irrigation, small scale irrigation facilities such as pipeline from barrage to fields are established. The area of fields developed in each region by this activity is mentioned below.

Table 8.1.15 Development of Small Scale Irrigation by PAFASP

Region	Developed Area of Small Scale Irrigation (ha)
Centre-Nord	169.00
Nord	50.00
Sahel	0.00
Hauts-Bassins	81.80
Cascade	6.00
Boucre du Mouhoun	45.00
Centre-Ouest	94.30
Prateau-Central	19.00
Centre-Sud	20.00
Centre	8.00
Total	493.10

Source: JICA team made based on interview with PAFASP (as of November 2013)

(2) USAID

Agribusiness Trade and Promotion (ATP) program of USAID focused on onion trade in West Africa

and aimed at improving the price and value. The implementation period was from 2008 to 2013 and the budget was about 20 million USD.

In this program, seed of PREMA178, which is a variety of onion for rainy season cultivation bred in Thailand, were introduced in 2009 through seed project of USAID. After that, introduction of the rainy season onion variety was started for cultivating onions throughout the year.

In 2010, this program and INERA conducted trial cultivations of 6 varieties of onions for rainy season including PREMA178. As a result, PREMA178 was the most suitable variety for rainy season cultivation in Burkina Faso. After that, the PREMA178 was extended to some areas such as Korshimoro.

(3) MCC

Millennium Challenge Compact was a 5 years program started in July 2007 by United States of America (Millennium Challenge Corporation: MCC) and Burkina Faso. The over goal was poverty reduction and economic development. Its grant amount was 481 million USD in total and 142 million USD of the total was for agricultural development.

In the program, a project aiming at improving agricultural productivity was implemented in Cascades region, Boucle du Mouhoun region, Hauts Bassins region and Sud-Ouest region. Major activities were water management, agricultural diversification and agricultural finance. Although target crops were all crops that have sustainability and high profitability, tomato, onion and rice were described the PDM.

(4) IFAD

Projet d'Appui aux Filières Agricoles (PROFIL) was supported by IFAD and implemented from 2008 to 2013. The project budget was 16.86 million USD and IFAD supported 13.83 million USD of its.

Target areas were Sahel region, Centre Nord region, Nord region and Boucle du Mouhoun region. Over goal was "poverty reduction by improvement of access of poverty areas to growing market". Objectives of the project were 1) promotion of cooperation among target groups and other actors of each value chain of cowpea, sesame, meat (goat, sheep and chicken) and onion, 2) capacity development of the group members and organizations, 3) improvement of access to service regarding investment and sales for production in the poverty areas.

8.1.6 Activities of the Government Organizations

(1) MARHASA

The DGPV is implementing Programme de Developpement des Culture Maraichères (programe of vegetable cultivation development) by the Government budget. The implementation period is from 2011 to 2015. The program is supporting production of onion seeds and seed potato in 40 ha of irrigation area in Dori. In 2011, onion seeds (Violet de Galmi) were produced in about 10 ha of the irrigation area. After that, seed potato has been produced in the irrigation area and the onion seed production has not been supported by MARHASA. Although onion seeds are produced in other areas, DGPV does not support at present.

The DGPER is implementing activities regarding onions through the PAFASP mentioned above. However, there is other onion projects implemented by the government own budget.

(2) INERA

The INERA produces foundation seeds of onion (Violet de Galmi) for dry season cultivation in the centers in Tougan and Bobo-Dioulasso and sells to seed producers. However, the quantities of production and sales are not clear.

In addition, the CREAM in Kamboinsé implemented a pot cultivation trial regarding sowing time of onion varieties for rainy season cultivation by the government budget in 2014. Although the result is under confirmation and analysis, it is expected that the rainy season onions can be harvested in middle or end of September if it is sown in May. The expected yield is from 10 to 11 tons/ha.

8.2 Promotion Issues and Measures

Based on the present situation mentioned above, issues and measures for market oriented onion promotion mainly for the domestic market are analyzed and considered.

8.2.1 Promotion Issues

In the domestic market, selling quantity of onions is high and the onion price is the lowest from February to April that is just after harvest season of dry season cultivation. After that, the selling quantity decreases and the selling price increases. In addition, import quantity of onions increases when the selling quantity of domestic onions is less, from August to December (Fig. 8.1.2). The import quantity is also increasing in recent years (Table 8.1.2). A case of quantity and price of onion sold by producers in Korsimoro is shown in the figure below. Since Korsimoro is a general onion production area in Burkina Faso, it is suggested that situation in other production areas is almost same. In Korsimoro, about 67% of total sold quantity is sold from February to April. Also, price in March and April is about 15,000 FCFA/120kg and that in September is 80,000 FCFA/120kg in 2013.

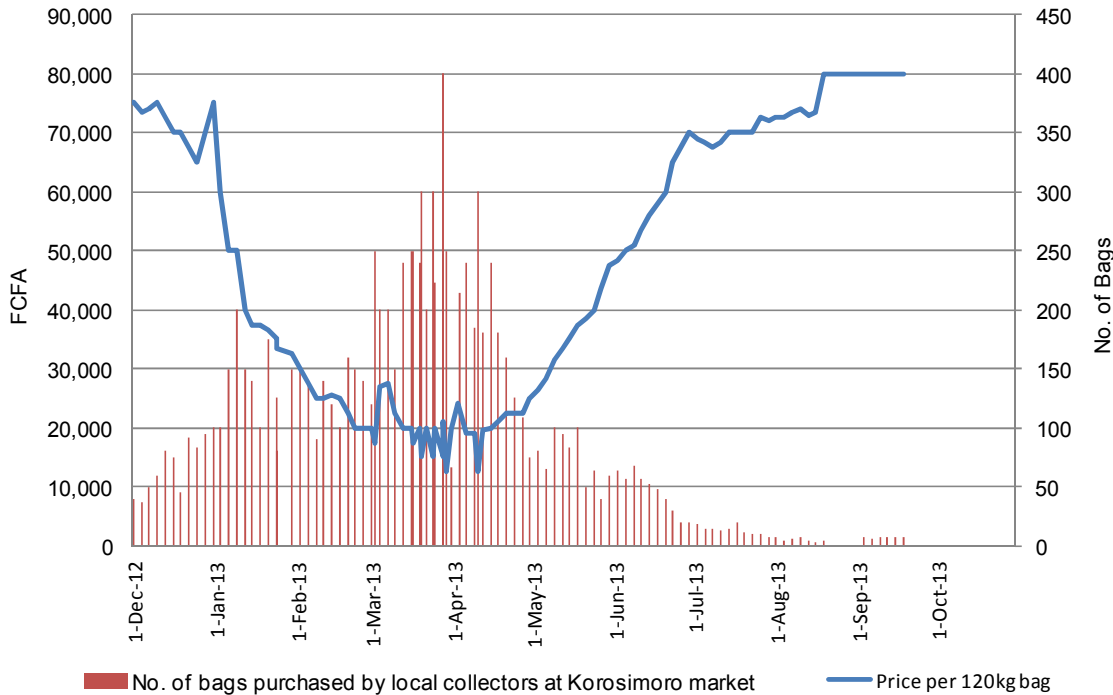


Fig. 8.2.1 Change of Quantity of Onion sold by producers and Price in Production Area in Korsimoro (December 2012 – October 2013)

Source: JICA team made based on the data of UDGPM/K

Assuming that onion consumption per person is 10 kg/capita/year¹⁵, monthly onion consumption in Burkina Faso is 13,750 tons/month (population is about 16.5 million people¹⁶). In addition, assuming that onions produced in Burkina Faso (329,219 tons) are sold as same trend as that in Korsimoro

¹⁵ According to the FAOSTAT, there is no data of onion consumption of Burkina Faso. Therefore, onion consumption of the world (10 kg/capita/year) was used for the estimation. The onion consumption of Niger and Senegal that are onion production countries in West Africa is 18 to 20 kg/capita/year.

¹⁶ World Bank, World Development Indicators, 2012

mentioned above. Based on the assumption, monthly quantity of domestic onion sold by producers in Burkina Faso is estimated. As a result, monthly quantities of onion sold by producers from July to November in Burkina Faso are less than monthly onion consumption in Burkina Faso (13,750 tons/month). The total insufficient quantity from July to November is about 62,000 tons.

Since preference for the domestic onions seems to be rather than imported onions, it is expected that demand for domestic onions is also high in the off-season of onion in dry season cultivation. Therefore, increase of quantity of onion sold in the off-season meets the demand. In addition, the domestic onions sold in the off-season are an alternative to imported onions and it reduces import quantity.

Based on the situation, the promotion issue is “quantity of domestic onions sold in the off-season is low” in the onion promotion. Causes of the low quantity in the off-season are the followings. These causes are included in the promotion issue.

(1) Limited Cropping Seasons

One of the causes that onions are sold in a few months is that the cropping seasons are limited. Development and extension of cultivation techniques are necessary to diversify the cropping seasons. However, onion cultivation method in dry season is only one method that is established by the Government of Burkina Faso and only its technical sheet was made. Therefore, extension staffs cannot guide producers in cultivation methods in other cropping seasons. The producers cannot obtain information of cultivation techniques to diversify the cropping seasons.

(2) Insufficiency of Storage Capacity

Some parts of onion produced in dry season are sold in the off-season after stored. However, number of the storehouses is insufficient and enough quantity of onions cannot be stored. Although funds are required to establish the storehouses, it is not easy for small scale onion producers to get the fund. Although the Government or donors are supporting in establishing the storehouses, it is not sufficient. In the estimation above, selling quantity of domestic onions from July to November is less than consumption in Burkina Faso. The total insufficient quantity is about 62,000 tons. Since the stored onion can be sold until middle of September, out of the total insufficient quantity (62,000 tons), it is estimated that about 28,000 tons should be covered by the stored onions. PAFASP reported that storage capacity in Burkina Faso was about 5,000 tons in 2012. If the storage capacity is already used for selling onions after May, about 28,000 tons of storage capacity is required to cover the domestic consumption.

In addition, 50% of onions seem to be lost in traditional storage because of improper management such as piling onions in badly ventilated place, not removing damaged onions, not drying before storage, etc. These cases do not make the most of advantages of the storage.

8.2.2 Promotion Measures

Measures to cope with the promotion issues mentioned above are promotion measures. It means that increasing quantity of domestic onion sold in the off-season is a core of the promotion measures. In the neighboring countries also, selling quantity and price are seasonally fluctuating as well as the domestic market. On the other hand, onion distribution channel from Burkina Faso to the neighboring countries had been already established by exporters. Therefore, if it is possible to increase the quantity of onion sold in the off-season in the domestic market, it is possible to export to the neighboring countries. It means that these promotion measures can meet the needs of the domestic and neighboring markets.

The measures to increase quantity of domestic onions sold in the off- season are the followings.

(1) Diversification of Cropping Seasons

The measures to diversify cropping seasons of onion are 1) extension of cultivation in rainy season, 2) extension of early cultivation in dry season, 3) extension of sets planting.

1) Extension of Cultivation in Rainy Season

The onion cultivation in rainy season uses varieties for rainy season to cultivation in rainy season and the onions are harvested in October and November. In recent years, some producers started the cultivation in rainy season and the seeds for rainy season have been sold. The cultivation in rainy season requires irrigation facilities as same as the cultivation in dry season. However, the cropping area of onion in dry season is enough large in comparison with that in rainy season and the area of cultivation in dry season will be a target area for the cultivation in rainy season for the time being. Therefore, development of irrigation facilities is not required for the onion cultivation in rainy season. For extension of the cultivation in rainy season, following measures are suggested.

i) Improvement of Cultivation Techniques

Some producers of rainy season onions are scattered about some regions since seed supply companies are promoting the rainy season onions. However, the actual situation and suitable cultivation techniques are not clear. Therefore, a technical sheet is made with confirming and improving the cultivation techniques through trial cultivations and local adaptability trails based on the present situation of cultivation.

ii) Extension

Insufficiency of information regarding cultivation techniques of rainy season onion is a cause for producers to start the cultivation. In addition, the rainy season is a season for small scale producers to produce important grains for self-consumption. If the onion is produced in the rainy season, selection or competition of inputs such as labor force may occur among the cultivations. However, possibility to cultivate both onions and grains is increase by providing information regarding work process and suitable land for the onion cultivation in rainy season. Therefore, information of the cultivation techniques, etc. is provided to producers to extend the onion cultivation in rainy season through demonstration cultivation.

Major problems on onion sales are not pointed out except price down in the harvest season. Moreover, present producers of rainy season onions do not have problems on sales. Traders want to buy the rainy season onions if quality of the rainy season onions is same as that of dry season onion in the off-season and certain quantity is available. It means that there seems to be no big problem on sales of the rainy season onions. On the other hand, there are producers who worry about possibility of the sales and hesitate about starting the cultivation since the varieties for rainy season are different from that for dry season and there are little results. Therefore, information about production situation and sales possibility of the rainy season onions are shared among producers and traders.

2) Extension of Early Cultivation in Dry Season

Early cultivation in the dry season uses same varieties as that for general cultivation in dry season (mainly Violet de Galmi). The early cultivation is started 1 or 2 months earlier than the general cultivation in dry season in order to harvest earlier. The harvest time is around one month earlier than that of general cultivation and the onions are sold only at the end of the off-season which period is around half year. Although there are risks regarding weather condition, the cultivation method is almost same as that of general cultivation except the starting time. And it is relatively easy to introduce the cultivation. Therefore, there are producers who started the cultivation method in many regions. Impact to the quantity sold in the off-season is limited, the cultivation method

seems to be extended without inputs by the Government.

3) Extension of Sets Planting

Set planting is that once bulbs are taken out when the size is around 2 cm and then the small bulbs are replanted after storing for 2 or 3 months. If seeds are sown before rainy season and the stored small bulbs are replanted just after end of the rainy season, the harvest time may be earlier. However, there is no experience of the set planting in Burkina Faso. Since many items such as suitable cultivation season, cultivation method, variety, etc. are not clear, fundamental trials, information collection are necessary to establish the cultivation techniques. Therefore, there are many items to be examined and long time is required before starting the extension. Moreover, it is not clear at present that the sets planting can be applied to the condition in Burkina Faso.

(2) Improvement of Storage Capacity

Necessary measures to improve the storage capacity are the followings.

1) Increase of Storehouse

While introduction of the storehouses are promoted by support of PAFASP, capacity of the storage increased to about 5,000 tons. However, the capacity is still insufficient as mentioned in the promotion issues. The producers recognize efficiency and necessity of the storehouses that make the onion sales in high price season. Since it is difficult for the producers to ensure funds to construct the storehouses, increase of the storehouses is not promoted. Therefore, support for construction of the storehouses by the Government or support organizations is continued and expanded.

2) Extension of Suitable Methods of Storage

Suitable management is important for storage from the cultivation. Works such as stopping irrigation before harvest, harvesting after ripening, not injuring bulbs at harvesting, drying after harvesting, etc. are required on the cultivation. In addition, it is important to storage not to keep too many onions in shelves, to remove damaged onions, etc. If storehouses are newly established, loss of storage is kept below 20%. However, there is possibility not to be used ability of the storehouses well if the knowledge for management is insufficient. Therefore, information and techniques are extended for producers to understand and practice the knowledge and the loss of storage is kept low.

3) Improvement of Storehouses

The storehouses introduced by support of PAFASP are 2 types that are a shelf type storehouse made of bricks and concrete and a hut type storehouse made of steel frame and straw. Both types prevent high temperature by ventilation using natural wind and blocking direct sunshine. Although the shelf type storehouse needs to be improved a little such as increasing ventilation holes to reduce the storage loss, the improvement points are clear. In addition, the storage loss is sufficiently low (less than 20%) in comparison with the storage loss of traditional storage method (around 50%). Therefore, examination of big improvement of the storehouses is not necessary.



8.3 Pilot Activity for Trial Cultivation of Rainy Season Onions

8.3.1 Pre-pilot Activity

(1) Background and Objective

The main cultivation period of onions in Burkina Faso is dry season. In March and April, the dry season onions are harvested and sold to the market. The price of the onion fluctuates seasonally and decreases in this period. On the other hand, the price of onions increases with decreasing of the quantity of onions sold to market. The price is the highest from October to December and quantity of imported onions from Netherlands, etc. increases at the same time.

Onion producers are currently trying to start the cultivation in dry season at the end of August, in order to harvest before the price coming down in February. The rainy season onions can be harvested in October or November in which the price of onions goes up. It is expected to replace imported onion during the off-season. On the other hand, the producers do not recognize the cultivation well and not have enough knowledge of the varieties and the cultivation method of the rainy season onions, since the cultivation in rainy season has been started in the recent years.

Therefore, trial cultivation using traditional cultivation method and three varieties of rainy season onions is conducted with producers who have experience of cultivation of rainy season onions. Objectives of the pre-pilot activity is to collect the information of 1) actual situation of the rainy season onion cultivation, 2) characteristic of the three varieties, 3) preference of consumers on the three varieties and to extract characteristic and problems of the cultivation.

(2) Implementation Areas and Target Groups

Korsimoro in Sanmatenga province was selected to understand actual situation of the cultivation of rainy season onion since the area locates near Ouagadougou and producers in the area have experience of the cultivation in rainy season onions. Through discussion with vegetable producers union in Korsimoro, Sanmatenga province (UDGPM/K: Union Départementale des Groupements des Producteurs des Maraichers de Korsimoro), the trial cultivation was implemented in 2 sites, Guerba and Koopela Banoogo.

Four onion producers who are members of UDGPM/K and have experience of the cultivation of rainy season onions managed the field in collaboration with PAPAOM.

(3) Contents of the Trial Cultivation and the Results

Period: June – December 2013

Varieties: three varieties of rainy season onions (PREMA178, ALIZE and JULIO)

Sowing: The seeds were sown in three different days. The days are the followings.

- First sowing: 1st July 2013
- Second sowing: 15th July 2013
- Third sowing: 30th July 2013

Trial Plots: The plots were set as the followings.

- One section: $5\text{m} \times 7\text{m} = 35\text{m}^2$. One section is for one variety in one sowing. Total 9 sections (three varieties multiplied by three sowing days).
- One plot: one plot is $35\text{m}^2 \times 9$ sections = 315m^2 .
- Site: The number of sites is two, Guerba and Koopela Banoogo. Two plots were set in each site (total 4 plots).

Cultivation Schedule:

Table 8.3.1 Cropping Calendar of Pre-pilot Activity

Activity	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Nursery Preparation		■					
Field Preparation		■	■				
Cultivation (first sowing)		▲	▼ ■	■ ■		●	
Cultivation (second sowing)		▲	▼ ■	■	■	●	
Cultivation (third sowing)		▲		▼ ■	■ ■		●

Legend: ▲: Sowing, ▼: Transplanting, ■: Fertilization, ●: Harvesting
Weeding and irrigation were done based on the producers' decision.

Sowing: Quantity of the seeds sown was more than that of cultivation in dry season since the sowing time was in the beginning of rainy season and risks were high because of no certain cultivation techniques. Price of the seeds of rainy season onions was 50,000 FCFA/kg of PREMA178, 76,000 FCFA/kg of ALIZE and JULIO. Price of the local seeds of dry season onion was 25,000 FCFA/kg.

Raising Seedlings: In Koopela Banoogo, amount of the seedlings of JULIO sown in the third sowing were not enough for the field since they did not grow well. Shape of the nursery in Koopela Banoogo was different from that in Guerba, and there was possibility that the different affected the growth of the seedlings.

In both sites, quantity of seeds sown in the nurseries was much and density of the seedlings was high. The seedlings grown under high-density condition were small. There was possibility that the high density condition inhibited the growth of seedlings.

Field: Chemical fertilizers were spread between beds.

Frequency in irrigation for the rainy season onion was once in 5 or 6 days in general. That in March and April, highest temperature season, was once in 3 or 4 days. Irrigation was rarely required from June to August since it was rain. It suggested that cost of fuel for irrigation pump might be kept lower than that in dry season, since it is rains in the cultivation in rainy season and the frequency in irrigation is lower in comparison with the cultivation in dry season.

Although PREMA178 and ALIZE grew in both sites, growth of JULIO in both sites was poorer than that of other two varieties.

Growth in Koopela Banoogo was poorer than in Guerba. In Koopela Banoogo, drainage in the

field was poor and moss plants grew between the beds. The poor drainage condition might affect the growth. However, growth of onion in dry season after the pre-pilot activity was also poor. Although causes of the poor growth might be soil degradation, etc. which are not caused by the rainy season, variety, etc. the causes were not clear.

(4) Result of the Harvest

The yields of the three varieties in both sites are shown below.

Table 8.3.2 Yield of the Three Varieties per Cultivation Area (35m²) in Each Site

Site	Variety	First Sowing Sowing: 1st July Transplanting: 7th August	Second Sowing Sowing: 15th July Transplanting: 21st August	Third Sowing Sowing: 30th July Transplanting: 5th September
Gouerba	PREMA178	28.5kg/35m ² (8.1t/ha)	39.0kg/35m ² (11.1t/ha)	29.5kg/35m ² (8.4t/ha)
	ALIZE	7.6kg/35m ² (2.1t/ha)	10.0kg/35m ² (2.8t/ha)	13.0kg/35m ² (3.7t/ha)
	JULIO	4.5kg/35m ² (1.2t/ha)	6.0kg/35m ² (1.7t/ha)	5.0kg/35m ² (1.4t/ha)
Koopela Banoogo	PREMA178	8.5.0kg/35m ² (2.4t/ha)	6.0kg/35m ² (1.7t/ha)	7.0kg/35m ² (2.0t/ha)
	ALIZE	15.8kg/35m ² (4.5t/ha)	2.5kg/35m ² (0.7t/ha)	12.0kg/35m ² (3.4t/ha)
	JULIO	3.0kg/35m ² (0.8t/ha)	1.5kg/35m ² (0.4t/ha)	2.5.0kg/35m ² (0.7t/ha)

Better results in the sites are shown.

() is indicating the equivalent yields per 1 ha

In Gouerba, the yield was good in order of PREMA178, ALIZE, JULIO in all sowing.

In Koopela Banoogo, the yield was good in order of ALIZE, PREMA178, JULIO in first and third sowing. In the second sowing, the yield was good in order of PREMA178, ALIZE, JULIO. However, relation between sowing time and yield of each variety was not clear.

PREMA178 and ALIZE among the three varieties of rainy season onions could grow. In Korsimoro, PREMA178 have been cultivated in rainy season. The result of this trial showed that ALIZE also could grow in Korsimoro. However, growth and yield of JULIO of all sowing times was not poor in both sites.

While some onion bulbs of PREMA178 and ALIZE grew well, the yield of rainy season onions in this trial cultivation was lower than the expected yield. According to the onion producer who has experience of cultivation in rainy season, the yield of rainy season onions was 7 to 8tons/ha in general. On the other hand, the yield of PREMA178 was 29 tons/ha in a varieties examination by USAID. The causes of difference among these yields are not clear. In addition, the cultivation techniques to produce the good bulbs stably and to get suitable yield have not either established or extended. Although the onion cultivation in rainy season has potential to produce the well yield, the unstable cultivation results may retard extension of the rainy season onion cultivation. It is necessary to improve the cultivation techniques for rainy season onions.

(5) Results of the Sales

The onion producers of this trail sold the rainy season onions to the local market in November and the selling price was 750 FCFA/kg. This selling price was six times of the lowest price in April 2013.

Quantity of production of rainy season onions is few at present and most of the rainy season onions

have been consumed in the production areas. According to onion traders in Ouagadougou, they have sold onions imported from Netherlands, Morocco, etc. during the off-season. Although the onion traders are interested in the rainy season onions, the traders do not know the production areas and the production quantity has not satisfied the traders. That is why the traders do not deal in the rainy season onions. According to the traders, they want to deal in the rainy season onions near the future if they could stably buy certain quantity of the onions, since the consumers prefer the domestic onions.

(6) Results of the Preference Survey

Preference of color and taste of the 3 varieties cultivated in the trial were surveyed. Number of the respondent was 11 consumers. Fresh onions were used for the taste preference. Results of the preference survey for the 3 varieties of rainy season onions are shown below.

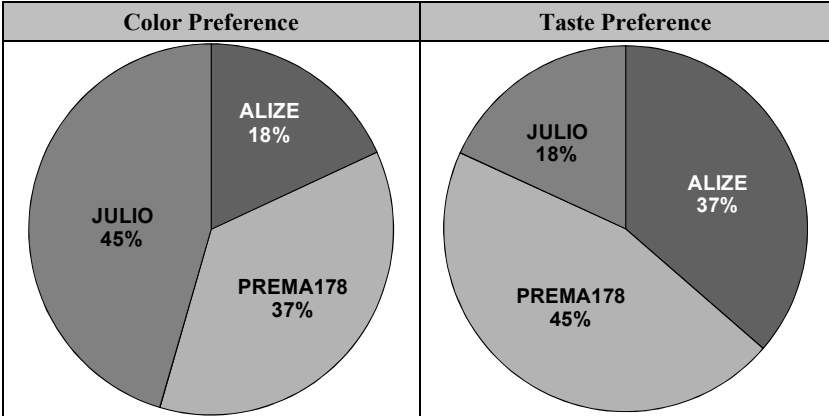


Fig. 8.3.1 Result of Color and Taste Preference Survey

Although the 3 varieties of rainy season onions have purple color and spicy taste which Burkinabe like, their preference was different within the condition. Taste of PREMA178 was preferred most and color of JULIO was preferred most. However, many respondents said that the color of JULIO was too dark. It can be said that PREMA178 suits consumers’ preference since it was preferred in both color and taste by about 40% of respondents.

(7) Conclusions of the Pre-pilot Activity

- a) There is some possibility that growth of seedling was not good because of high density of the seedlings.
- b) There is some possibility that the yield was low because of poor drainage condition of the fields
- c) The chemical fertilizers were spread between beds and the fertilizers may flow out from the field with water of rain and irrigation. There is some possibility that the yield was low since the fertilizers may not be absorbed by the onions.
- d) The yield of JULIO was low in comparison with PREMA178 and ALIZE.
- e) The rainy season onions can be sold at higher price than that of the dry season onions.
- f) Onion traders want to deal in the rainy season onions if certain quantity of its production is available.
- g) Both of color and taste of PREMA178 are preferred. There is a big difference of preference on dark color of JULIO among consumers.

8.3.2 Outline of the Pilot Activity

(1) Background and Objectives

In the value chain survey of onion, extension of rainy season onions are proposed as a measure for the issue that quantity of domestic onions sold in the off-season is low. It is expected that the rainy season onions are harvested in October, when the selling price increase, and replace imported onions. In addition, the results of pre-pilot activity suggested that it is necessary to improve the cultivation techniques and provide the information of rainy season onions to producers and traders.

Therefore, the following hypotheses regarding extension of the rainy season onions are verified in this pilot activity. Objective of the pilot activity is that results and lesson learned of the pilot activity are reflected to the promotion plan for onion to enhance realizability of the promotion plan.

(2) Hypotheses to be Verified and Related Promotion Measures

Extension of rainy season onions is proposed as a promotion measure. For the extension, 2 measures, 1) improvement of cultivation techniques of the rainy season onions and 2) extension for producers and traders to acknowledge the rainy season onions, are proposed. In this pilot activity, the following 2 hypotheses regarding the 2 measures are verified.

Hypothesis 1: The rainy season onions can be sold in the off-season and the production is improved by improvement of the cultivation techniques.

Hypothesis 2: The cultivation techniques are transmitted to producers and interest of traders in the rainy season onions increases by conducting the cultivation and field days in producers' fields.

(3) Intervention by the Pilot Activity in the Value Chain

This pilot activity intervenes in producers and traders to contribute improvement of the cultivation techniques and increase of selling quantity of the rainy season onions.

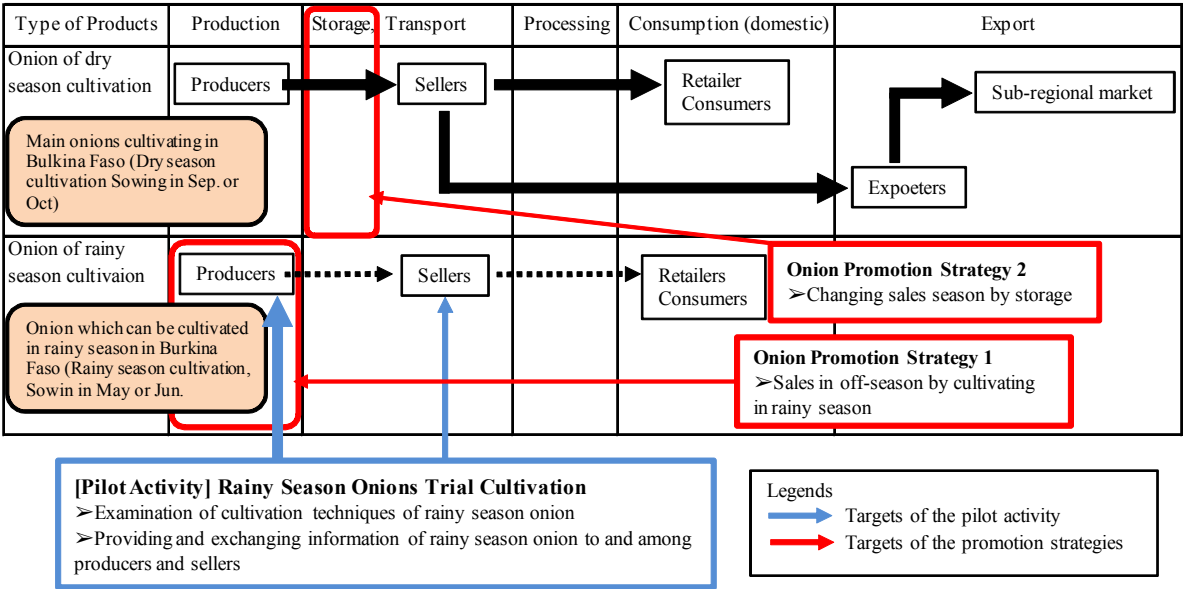


Fig. 8.3.2 Intervention by the Pilot Activity in the Value Chain of Onion

(4) Contents of the Pilot Activity

1) Implementation Areas

Around Yako, Passoré province, Nord region

Around Korsimoro, Sanmatenga province, Centre-Nord region

2) Target Groups

Onion producers' union or vegetable producers union in the above implementation areas

3) Implementation Period

May to December 2014

4) Implementation Organization

JICA team, DGPER and DRARHASA

5) Contents of the Activity

i) Trial Cultivation and Monitoring of the Rainy Season Onions

Before starting the trial cultivation, cultivation seminars are conducted to explain cultivation method of the rainy season onions to the producers. The producers cultivate the rainy season onions in each field based on the explanation under support by JICA team.

In the above 2 implementation areas, each variety is cultivated in 0.25 ha of field in each area. Varieties cultivated are PREMA178 and ALIZE. The onions are cultivated by using 2 cultivation methods, traditional method and trial method. The traditional method is cultivation methods that the producers have cultivated onions in rainy season or dry season as usual. The trial method is a cultivation method which sowing density in nurseries, shape of beds in field and an application method of chemical fertilizers are changed from the traditional method.

As the monitoring, the producers record their work and JICA team and DRARHASA confirm the work.

ii) Field Days

Onion producers and onion collectors in production areas gather in the trial fields and observe the growth of the rainy season onions. The field days are conducted just before harvest in each area.

iii) Monitoring of Sales of the Products

The producers sell the products harvested in the trial cultivation and record the harvested quantity, sold quantity, selling price and buyers. Based on the monitoring records of cultivation and sales, profitability of the rainy season onions are evaluated.

8.3.3 Implementation and Results of the Pilot Activity

(1) Trial Cultivation and Monitoring of the Rainy Season Onions

1) Selection of the Implementation Fields

To confirm possibility of the cultivation of rainy season onions, Yako in Passoré province was selected from production areas of dry season onions in northern part of Burkina Faso since the part is relatively suitable for the cultivation of rainy season onions. In addition, Korsimoro in Sanmatenga province was selected to compare the traditional method with the trial method since producers in Korsimoro have experience of the cultivation.

JICA team and the C/P explained the pilot activity to DRARHASA of Nord region and Centre-Nord

region and DPARHASA of Passoré province and Sanmatenga province to ask their cooperating on the pilot activity.

Through discussion with producers unions in the areas, 4 producers were selected in each area and they took on a role of field management in the trial cultivation.

Location of nurseries and fields established by the selected producers are shown below.

Table 8.3.3 Location of the Implementation Fields of the Trail Cultivation of Rainy Season Onions

Area	Location of Nursery	Location of Field
Korsimoro	Koupela	Koupela
Yako	Yagbraodo	Yagbraodo
	Gomponsom	Ouonon
	Kountampoure	Ouonon
	Kountampoure	Kountampoure, Zougoungou

The producers in Yako cultivated separately in different place. All producers in Korsimoro cultivated only in Koupela. The producers in Yako did not have experience of cultivation of rainy season onions and the producers in Korsimoro had it.

2) Opening Explanation and Cultivation Seminar

On 13 June in Yako and on 14 June in Korsimoro, the objectives and the outline of the pilot activity were explained to the producers. And then, cultivation seminars for the cultivation of rainy season onions were conducted in the fields. The producers managing the trial fields, extension staffs of the DPARHASAs and producers who live in the areas and are interested in the cultivation of rainy season onions participated to the seminars. In the seminars, all works of the cultivation that include preparation of nursery and sowing were explained. In the explanation, the traditional method that producers are using for the cultivation of dry or rainy season onions and trial method that a seed supply company recommends were compared. The participants were interested in the difference and listened to the explanation.



3) Sowing and Raising Seedlings

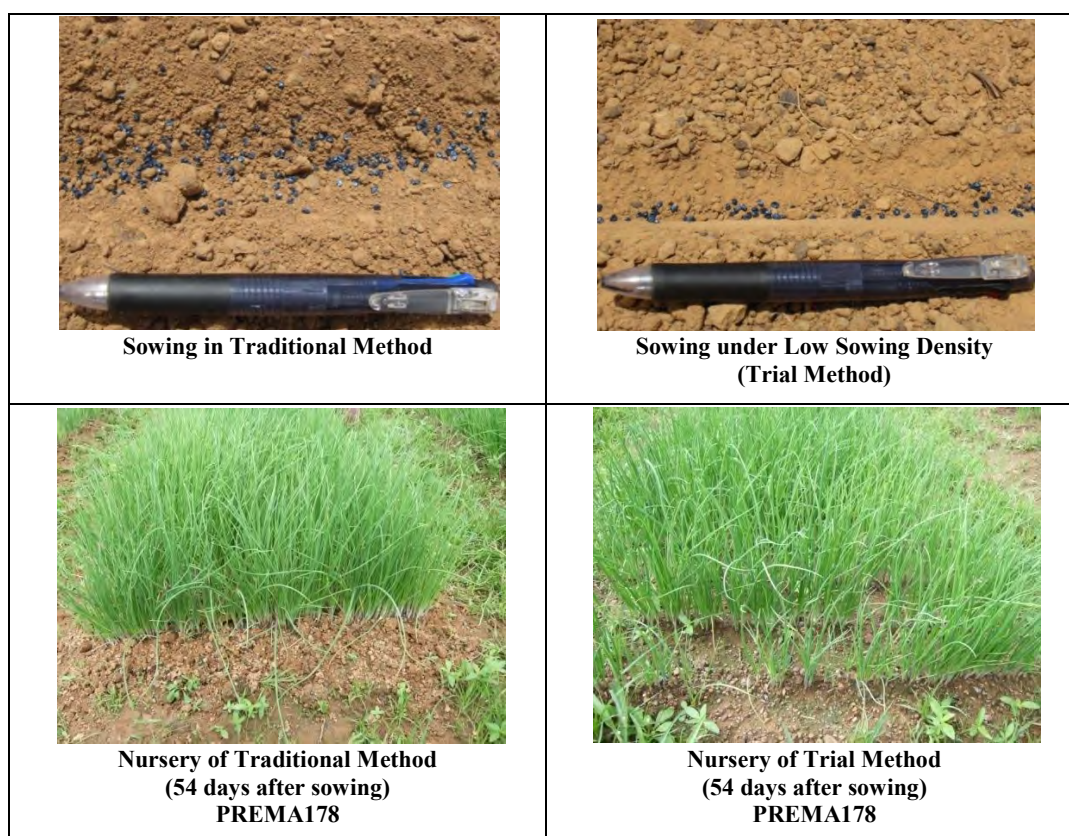
Usually, sowing density is high and the seedlings grow thickly since many seeds are sown in small nursery. Therefore, it may cause poor growth of onion after transplanting of such small or poor seedlings. In the pilot activity, raising fine seedlings was tried by low sowing density and long raising period in nursery.

Nurseries were prepared in each area. The nurseries were 10 to 15 cm height and 1 bucket of manure was mixed with soil in each 2 m². In the middle or end of June, 2 varieties of onion (PREMA178 and ALIZE) were sown.

Size of the established nurseries, quantity of sowing seed and sowing density are shown in the table below. In the traditional method, spacing between rows was 15 to 20 cm and the quantity of sowing seed was 12.5 g/m² in Yako and 26.0 g/m². In the trial method, the spacing between rows was 10 cm and the quantity of sowing seed was 5.0 g/m².

Table 8.3.4 Size of Nursery and Quantity of Sowing Seed

Variety	Area	Traditional Method			Trial Method		
		Size of Nursery	Quantity of Sowing Seed	Sowing Density	Size of Nursery	Quantity of Sowing Seed	Sowing Density
PREMA178	Korsimoro	38.4m ²	1,000g	26.0g/m ²	128.0m ²	640g	5.0g/m ²
	Yako	160.0m ²	2,000g	12.5g/m ²	240.0m ²	1,200g	5.0g/m ²
ALIZE	Korsimoro	38.4m ²	1,000g	26.0g/m ²	128.0m ²	640g	5.0g/m ²
	Yako	160.0m ²	2,000g	12.5g/m ²	240.0m ²	1,200g	5.0g/m ²



After the sowing, the raising seedlings were managed with fertilizing, watering, etc. Just before transplanting, percentage of fine seedling was surveyed. Conditions of the fine seedlings are the followings.

- Height of seedlings is 20 to 30 cm
- Thickness of the seedlings is 5 to 6 mm
- The seedlings have enough roots

The result of fine seedling survey is shown in the table below. Raising period of the trial method was longer than that of the traditional method since the fine seedlings should be transplanted. As a

result, percentage of the fine seedlings was 80 to 85% in the trail method although it was 50 to 60% in the traditional method. It means that percentage of the fine seedlings increased and more fine seedlings could be transplanted by decreasing the sowing density and expanding the raising period.

Table 8.3.5 Result of Fine Seedling Survey

Variety	Area	Traditional Method		Trial Method	
		Survey Timing (number of days after sowing)	% of Fine Seedlings	Survey Timing (number of days after sowing)	% of Fine Seedlings
PREMA178	Korsimoro	51	54.5%	61	82.2%
	Yako	53	60.2%	64	86.0%
ALIZE	Korsimoro	51	52.0%	-	-
	Yako	53	62.5%	64	85.9%

4) Preparation of Fields and Transplanting

Usually, beds are made in fields and seedlings are transplanted at the side of the beds. However, it some possibility were suggested that soil keeps much moisture by rains and it causes poor growth of onions. Therefore, to avoid the excess water injury, top of the beds was made flat and onions were transplanted on the top in the trial method.

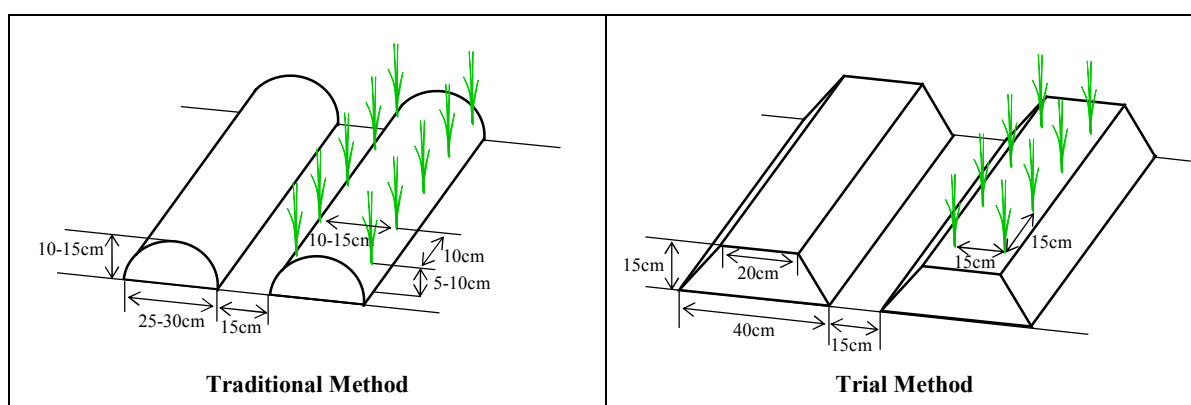


Fig. 8.3.3 Change of Shape of Beds and Transplanting Position

After mixing manure with soil in the fields, two kinds of beds above were made in the fields. Quantity of manure applied was same in both methods. The seedlings were transplanted after 48 to 59 days from sowing (beginning to middle of August) in the traditional method. They were transplanted after 55 to 72 day from sowing (middle to end of August) in the trial method. Positions and spacing of the transplanting are shown above.

Sine of cultivated area in each area are shown below.

Table 8.3.6 Size of Cultivated Area of the Trail Cultivation of Rainy Season Onions

Variety	Area	[Unit: m ²]	
		Traditional Method	Trial Method
PREMA178	Korsimoro	2,604	1,351
	Yako	4,412	3,804
	Total	7,016	5,155
ALIZE	Korsimoro	2,653	1,351
	Yako	3,273	3,164
	Total	5,926	4,515

Note: The Size does not include footpaths in the fields.

5) Chemical Fertilizer Application

i) Applied Quantity

Same kind and quantity of chemical fertilizers were applied in both cultivation methods. The kind, timing and applied quantity are shown in the table below.

Table 8.3.7 Results of Chemical Fertilizer Application to the Fields

Area	Number of Times	Traditional Method			Trial Method		
		Application Timing (number of days after transplanting)	Kind of Chemical Fertilizers	Applied Quantity (kg/ha)	Application Timing (number of days after transplanting)	Kind of Chemical Fertilizers	Applied Quantity (kg/ha)
Korsimoro	First Time	Middle of Aug. (about 10 days)	DAP	200	End of Aug. (about 10 days)	DAP	200
	Second Time	Beginning of Sep. (about 30 days)	NPK 14-23-14	200	Beginning of Sep. (about 26 days)	NPK 14-23-14	200
	Third Time	End of Sep. (about 50 days)	NPK 14-23-14	200	End of Sep. (about 50 days)	NPK 14-23-14	200
	Fourth Time	Middle of Oct. (about 60 days)	Urea	50	Middle of Oct. (about 60 days)	Urea	50
Yako	First Time	End of Aug. (about 10 days)	DAP	200	Beginning of Sep. (about 10 days)	DAP	200
	Second Time	Beginning of Sep. (about 26 days)	NPK 14-23-14	200	End of Sep. (about 30 days)	NPK 14-23-14	200
	Third Time	Beginning of Oct. (about 50 days)	NPK 14-23-14	200	Middle of Oct. (about 50 days)	NPK 14-23-14	200
	Fourth Time	Middle of Oct. (about 60 days)	Urea	50	End of Oct. (about 60 days)	Urea	50

ii) Application Method

In the traditional method, the fertilizers were only spread between the beds or mixed with soil after spreading between the beds. On the other hand, the fertilizers were applied on a line on the middle of the beds and then covered with soil in the trial method.

In case of traditional method, there is some possibility that fertilizers flow out to outside of fields with rain or irrigation water and effectiveness of fertilizing may low. In addition, rainwater between beds was kept to avoid that the fertilizers flowed out with the water. In this case, excess water injury may be caused onions. In the trial method, flowing out of the fertilizers to outside of the fields was avoided by applying the fertilizers on the middle of the beds and covered with soil.

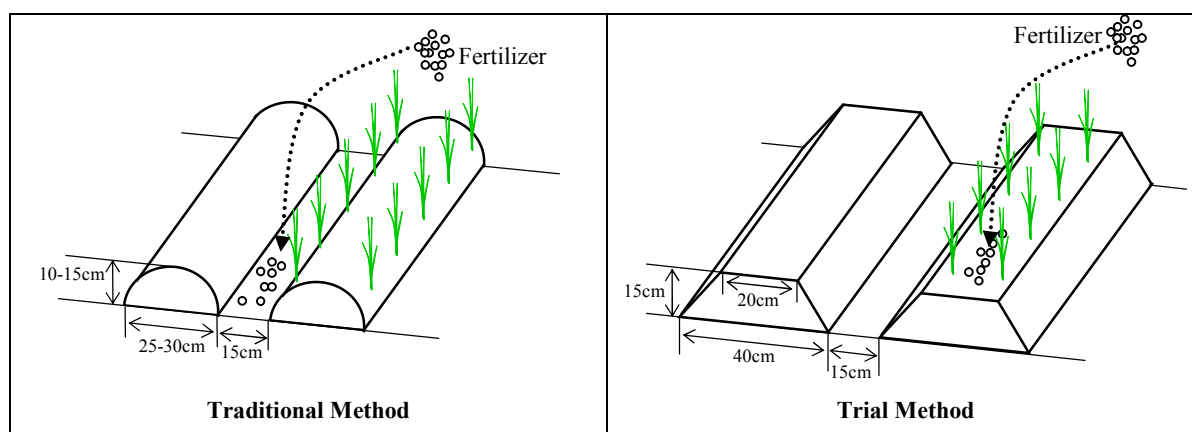


Fig. 8.3.4 Change of Application Method of Chemical Fertilizers

6) Harvest

i) Harvest Timing

The onions were harvested from the beginning to middle of November in Korsimoro and in the end of November in Yako. It means that they were sown from the middle to end of June and harvested in November in this pilot activity. They might be harvested from the end of September to October if they had sown in May.

The harvest timing of ALIZE tended to be a little earlier than that of PREMA178.

ii) Yield

The yields of both areas by variety and cultivation method are shown in the table below. The yields had big difference by areas and fields. It shows the yield is still unstable.

In Korsimoro, the yields of the trial method of both varieties were higher than that of the traditional method. In Korsimoro, the onions were cultivated in one place and soil of the field is clay soil. Therefore, it is suggested that the growth of onions was better since drainage condition became better by the trial method. In addition, it is also suggested that the effectiveness of fertilizer increased by changing the application method. In the trial method, size of the bulbs was relatively uniform in comparison with that in the traditional method. This may be also one of reasons of the better yields.

On the other hand, the yields of the traditional method of both varieties were higher than that of the trial method in Yako. Although the onions were cultivated in 4 places, clay soil was rare. Therefore, it is suggested that the growth was better in the traditional method since drainage condition is better. If the trial method is applied to fields that have good drainage condition, growth of onions may be inhibited because of dry soil. Especially, yields were low on sandy soil and stony soil. This may be caused by both of dry soil and outflow of fertilizers. In addition, number of plants in unit area in the trial method was lower than that in the traditional method since spacing between plants and between beds in the trial method was wider than that in the traditional method. This also may be one of the reasons of the lower yield in the trial method.

Yield in one field in Yako was 12 tons/ha (ALIZE in the traditional method). It suggests possibility of more than 10 tons/ha of yield of the cultivation of rainy season onions. However, yield of cultivation of dry season onions (Violet de Galmi) is more than 20 tons/ha. This difference may be caused by the size of the bulbs.

Table 8.3.8 Results of Harvest of the Trail Cultivation

Variety	Area	Traditional Method				Trial Method			
		Harvest Timing (number of days after transplanting)	Harvested Quantity (kg)	Cultivated Area (m ²)	Yield (t/ha)	Harvest Timing (number of days after transplanting)	Harvested Quantity (kg)	Cultivated Area (m ²)	Yield (t/ha)
PREMA178	Korsimoro	Beginning of Nov. (about 95 days)	891	2,604	3.42	Middle of Nov. (about 90 days)	607	1,351	4.49
	Yako	End of Nov. (about 100 days)	3,101	4,412	7.03	End of Nov. (about 90 days)	1,894	3,804	4.98
ALIZE	Korsimoro	Beginning of Nov. (about 95 days)	1,055	2,653	3.98	Middle of Nov. (about 90 days)	589	1,351	4.36
	Yako	End of Nov. (about 100 days)	3,086	3,273	9.43	End of Nov. (about 90 days)	1,166	3,164	3.69

iii) Size of Bulbs

Diameters of sample bulbs harvested in Korsimoro were measured. The result is shown in the table below. Percentage of 3 to 5.5 cm of bulbs was the highest in the traditional method of both varieties although diameters of some bulbs were less than 3 cm. On the other hand, percentage of more than 5.5 cm of bulbs was the highest in the trial method of both varieties and there was no bulbs that diameter was less than 3 cm. This suggests that the bulbs grow bigger by the trial cultivation. In addition, sizes of the bulbs of the trial method were uniform in comparison with that of the traditional method.

According to traders, since selling quantity of onions in the off-season, small onions that diameters are around 3 cm can be sold and about 5 or 6 cm of diameter is enough. Therefore, the onions of both varieties in the trial method were onions that could be sold in the off-season.

Table 8.3.9 Size of Bulbs Harvested in Korsimoro

Variety	Traditional Method				Trial Method			
	Less than 3cm	3 - 5.5cm	More than 5.5cm	Standard Deviation	Less than 3cm	3 - 5.5cm	More than 5.5cm	Standard Deviation
PREMA178	30%	60%	10%	1.17	0%	45%	55%	1.03
ALIZE	10%	80%	10%	1.07	0%	80%	20%	1.03

7) Results of the Trial Cultivation

- It is possible to cultivate rainy season onions in Yako and the yield is more than 10 tons/ha.
- Growth of seedlings becomes better and percentage of the fine seedlings increases by low sowing density. However, it requires larger nurseries and longer raising period in comparison with the traditional method.
- In this pilot activity, the sowing time was in the middle of June and the harvesting time was in the middle of November. If sowing time is in May, harvesting time might be in the end of September or October. However, there is some possibility that high temperature inhibits germination of onions in April.
- Size of bulbs and yield are improved by improvement of the cultivation techniques.
- There is no problem on the changed works for shape of bad and fertilizer application. And producers can adopt the works.

-
- f) Although the spacing between plants was 15 cm in the trial method, it was 10 cm in the traditional method. If the spacing in the trial method is changed to 10 cm to increase number of plants in unit area, it may be possible to increase the yield more.
 - g) Growth of onions on sandy or stony soil tends to be poor by the trial method.
 - h) Height of the beds needs to be adjusted based on soil condition. Although the height of beds was 20 cm in the trial cultivation, lower height may be better on well-drained soil such as stony soil. However, rainy season onions should not be cultivated on sandy soil.
 - i) In comparison with the dry season onions, size of bulbs of the rainy season onions were small and the yield was low and unstable. To make the yield high and stable, trial cultivations aiming at improvement of cultivation techniques need to be continued.

(2) Field Days

Aiming at providing information of the rainy season onions to onion producers and traders, the field days were conducted in the trail fields in both areas just before harvest.

1) Korsimoro

On 23 October, the field day in Korsimoro was conducted and around 60 people, DGPER, DGPV, DRARHASA, DPARHASA, producers in Korsimoro and traders, participated.

They observed onions in 3 fields of the traditional method, the trial method and a producer not belonging to the pilot activity to compare the growth. The participants asked many questions regarding the cultivation methods, varieties, etc. and it suggested that they were interested in the cultivation of rainy season onions much.

Although onion producers in Korsimoro had experience in the cultivation of rainy season onions, the cultivation was not good so far. They said that they learned the new techniques such as raising seedlings, fertilizer application through results of the trial cultivation and they wanted to try them in their fields next season.

Almost all of the participated producers said that the cultivation techniques proposed in the pilot activity were easy and they could use them by themselves. The producers having experience of the cultivation in rainy season onions said that they wanted to restart the cultivation or expand the cultivation area since increase of yield was expected by using the new techniques. In addition, some producers already started using the technique of raising seedlings with low sowing density for the dry season onions.

According to a women onion trader, a market channel to Cote d'Ivoire already exists and it is possible to export the rainy season onions if quantity of the rainy season onions increases. She also said that price of the rainy season onions might be same as that of onions sold in this season.

A staff of DGPV said that certain harvest could be expected by using the trial cultivation method and the rainy season onions selling at high price would be an important income source for producers. The staff also said that it might be good to consider extending the cultivation of rainy season onions as one of programs of DGPV.

The field day in Korsimoro appeared in a local newspaper (Sidwaya).

The cultivation of rainy season onions requires some conditions such as adjustment of works to grain cultivation, supplemental irrigation, etc. It is expected that the cultivation area can be expanded in the production area of dry season onions. Some producers said that they wanted to consider cultivating the rainy season onions by decreasing cultivation area of grains in rainy season. It suggested that interesting in the rainy season onions that produce high profit is high.



2) Yako

On 13 November, the field day was conducted in Yako and around 40 people of DRARHASA, DPARHASA, extension staffs, producers in Yako and traders, participated. They observed the field of the traditional method and the trial method and the producers in charge of the fields explained the methods.

In Yako, the trial cultivation was conducted in 4 fields in 3 places and it was the first cultivation of rainy season onions in all places. Soil conditions in the fields were different in each field and the growth of onions was different in each field. Therefore, it became clear that the cultivation techniques of the trial method were not suitable for all soil conditions. However, the producers recognized necessity of adjustment of the cultivation techniques based on the soil conditions through the trial cultivation since they have much experience of the cultivation of dry season onions. In addition, they said that they have ideas how to adjust based on the soil conditions.

This suggested that adjustment of the cultivation techniques is not so difficult for producers who know the onion cultivation well and they can adjust them by themselves although the cultivation techniques of rainy season onions need to be adjusted based on soil conditions

It was confirmed that results and lessons learned of the trial cultivation were useful for extension of the cultivation of rainy season onions in future. Examples of the results and lessons learned are that the cultivation of rainy season onions is possible in Yako, the cultivation techniques need to be adjusted based on soil conditions, etc.

According to traders, the rainy season onions can be easily exported if enough quantity of the rainy season onions could be collected since market channels to export onions to Cote d'Ivoire and Ghana already exist.

The producers in charge of the trial cultivation said that they could get information and knowledge to continue the cultivation without support although they did not know the varieties and cultivation techniques of the rainy season onions. Therefore, they also said that they would continue the cultivation and the techniques would be improved. This suggests that the producers are positive to continue the cultivation that has high profitability. In addition, it is expected that the cultivation of rainy season onions is extended to other producers by the producers who were in charge of the trial cultivation since onion producers who participated in the field day were interested in the rainy season onions much.



Observation of the Fields



Explanation of the Cultivation to the Participants by the Producers

3) Results of the Field Days

- a) The cultivation of rainy season onions could be shown to producers and traders in the field days and they could increase interest of the participants.
- b) It was suggested that trail cultivations and field days could be used as a part of extension activities.
- c) Producers, not only those one is in charge of the trail cultivation but also is around trail fields, are interested in the rainy season onions and they are positive to start or continue the cultivation. Therefore, it is suggested that the cultivation is accepted by the producers.
- d) Since high profit is expected, it is suggested that producers accept to allocate some parts of labor force, land, etc. for grain cultivation for the rainy season onions.
- e) The producers in charge of the trial cultivation could get knowledge and information to continue the cultivation of rainy season onion in future.
- f) Traders can sell and export the rainy season onions by existing market channels.
- g) Although the new cultivation techniques need to be adjust or improved based on soil condition, producers can adjust or improve by using lessons learned of the trial cultivation.
- h) There is some possibility to use the new techniques of raising seedlings for dry season onions.

(3) Monitoring of Sales of the Products

1) Korsimoro

The harvested rainy season onions were sold by the producers. The producers negotiated with collectors in production area about a date of collection and price. The harvested onions were sold to the collectors on the harvest days or the days after the harvest days. The collectors came to the field and collected the onions. After that the collectors transported them to Ouagadougou and sold. Sometimes they might be exported to Cote d'Ivoire. The onions were sold just after harvest and there was no problem on the sales.

Selling price of the producers was from 20,000 to 21,500 FCFA/50kg bag. There was no difference of selling price between PREA178 and ALIZE and between the traditional method and the trial method. Quantity of onions bought by one collector in a day was from 150 to 660 kg. There was a day that one collector bought only 150 kg from only one producer.

In case of dry reason onions, collectors go round a production area to buy onions. However, the trade of rainy season onions starts from contact from producers to collectors. Although producers

need to know collectors, producers of dry season onions already know collectors and there was no difficulty on the sales. The collectors who bought rainy season onions deal in the dry season onions.

Table 8.3.10 Results of Sales in Korsimoro

Buyer	Date	Number of Sales Producer	Total Sales (number of 50kg bag)	Total Selling Quantity (kg)	Unit Price	Total Value of Sales (FCFA)
Collector in Production Area A	9 Nov.	1 people	5.5	275	21,500 FCFA/bag 10,000 FCFA/0.5bag	117,500
	11 Nov.	4 people	9.5	475	20,000 FCFA/bag 10,000 FCFA/0.5bag	190,000
Collector in Production Area B	9 Nov.	2 people	3.5	175	21,500 FCFA/bag	74,500
	11 Nov.	1 people	3.0	150	21,500 FCFA/bag	64,500
	12 Nov.	5 people	13.25	663	20,000 FCFA/bag 1,000 FCFA/0.5bag 8,000 FCFA/0.25bag	268,000
	14 Nov.	3 people	15.0	750	21,500 FCFA/bag 20,000 FCFA/bag	307,500

2) Yako

In Yako, the producers separately sold their onions as same as the cultivation. The harvest was in the end of November and the sales were in the beginning of December.

The selling price was a unit of bag and the weight of one bag was 45 kg. The selling was from 15,000 to 20,000 FCFA/bag. It means the selling price was from about 330 to 440 FCFA/kg and it was from 2 to 3.5 times of that of dry season onions that was from about 120 to 150 FCFA/kg in the harvest season. There was no difference among varieties and cultivation methods.

Table 8.3.11 Results of Sales in Yako

Date	Number of Sales Producer	Total Sales (number of 45kg bag)	Total Selling Quantity (kg)	Unit Price	Total Value of Sales (FCFA)
29 Nov.	1 people	74	3,330	20,000 FCFA/bag	1,480,000
1 Dec.	1 people	32	1,440	20,000 FCFA/bag	640,000
5 Dec.	2 people	53	2,385	20,000 FCFA/bag	1,060,000
7 Dec.	1 people	30	1,350	19,000 FCFA/bag	570,000
12 Dec.	1 people	13	585	15,000 FCFA/bag	195,000

(4) Profitability of the Cultivation of Rainy Season Onions

Based on the results of the pilot activity, income and expenditure of the cultivation of rainy season onions per hectare were calculated. The result is shown in the table below. Since the selling prices were same regardless variety and cultivation method, the income was quite relied on the harvested quantity. Therefore, the income of the traditional method in Yako that harvested quantities were high was high. There was difference of expenditure between the areas since kind, unit price and quantity of inputs were different. Especially, there was bigger difference of expenditures for manure and fuel for pump between the areas. Anyhow, the total expenditures were from about one million to 1.6 million FCFA/ha. Percentages of expenditures of seeds, fertilizers and fuel for pump in the total expenditures were high.

Although there was some difference, all areas, varieties and cultivation methods could get profit. The lowest profit was about 240,000 FCFA/ha (ALIZE of the trial method in Yako). The highest profit was about 2.5 million FCFA/ha (ALIZE of the traditional method in Yako). It shows that the cultivation of rainy season onions can provide profit, although the yield is lower than that of the dry season onions.

Table 8.3.12 Results of Calculation of Income and Expenditure per one ha of the Cultivation of Rainy Season Onions

Variety	Item		Traditional Method		Trial Method	
			Korsimoro	Yako	Korsimoro	Yako
PREMA178	Income	Harvested Quantity (ton)	3.42	7.03	4.49	4.98
		Selling Price (FCFA/kg)	410	436	410	433
		Income (FCFA)	1,402,200	3,065,080	1,840,900	2,156,340
	Expenditure	Nursery	295,023	433,130	560,984	386,712
		Field	617,304	951,954	617,304	930,894
		Total Expenditure (FCFA)	912,327	1,385,084	1,178,288	1,317,606
Gross Profit (FCFA)		489,873	1,679,996	662,612	838,734	
ALIZE	Income	Harvested Quantity (tons)	3.98	9.43	4.36	3.69
		Selling Price (FCFA/kg)	410	436	410	433
		Income (FCFA)	1,631,800	4,111,480	1,787,600	1,597,770
	Expenditure	Nursery	316,723	663,579	564,037	429,159
		Field	617,304	951,954	617,304	930,894
		Total Expenditure (FCFA)	934,027	1,615,533	1,181,341	1,360,053
Gross Profit (FCFA)		697,773	2,495,947	606,259	237,717	

8.3.4 Lesson Learned and Issues

(1) Information about cultivation method of the rainy season onions is not enough among extension staffs and producers.

Producers in the areas where rainy season onions are not cultivated do not have information about the cultivation method. Therefore, the producers do not know the cultivation of rainy season onions and it is difficult for them to cultivate them. In addition, extension staffs also do not have information about the cultivation such as technical sheets and they cannot explain the cultivation to producers. Therefore, lack of information about the cultivation method is constraint on extension and cultivation of the rainy season onions.

(2) The producers can accept the cultivation of rainy season onions.

Producers in charge of the trail cultivation and participants of the field days were positive to start or continue the cultivation of rainy season onions. Therefore, it is suggested that the cultivation was accepted by the producers. And also the producers were positive to allocate some parts of inputs for grain cultivation such as labor force and land to the cultivation of rainy season onions. Therefore, it is suggested that the producers will cultivate the rainy season onions with grains.

(3) The production can be improved by improvement of cultivation techniques.

In the pilot activity, production of the rainy season onions was improved by changing techniques of raising seedlings, shape of beds and fertilizer application method in comparison of the case in Korsimoro. Therefore, there is some possibility of improvement in the traditional cultivation that producers are trying individually.

(4) It is necessary to continue to examine and improve cultivation methods.

In the trial cultivation in the pilot activity, the results were different in the fields although some results were relatively good. Soil conditions, climate conditions, etc. might be the reasons. Improvement of the cultivation of rainy season onions needs to be improved through continuing to examine suitable conditions and cultivation methods for the rainy season onions and clarifying conditions and cultivation methods for the sustainable production.

(5) Market channels for the dry season onions can be used for sales of the rainy season onions.

It is supposed that the areas where the cultivation of rainy season onions will be extended are the major production areas of dry season onions. In these areas, market channels between producers and traders already exist and the onions have been distributed through the channels. The rainy season onions are sold in the period when selling quantity of the dry season onions is little. Therefore, the rainy season onions can be sold by using the existing market channels.

(6) Interest of producers and traders in the rainy season onions can be increased by a field day and it is useful as extension activity.

In the field days, onion producers and collectors in production areas observed the cultivation of rainy season onions. As a result, the producers were interested in the cultivation much and positive to start it. The traders recognized that it was possible to sell the rainy season onions. Therefore, it is suggested that field days are useful for extension since producers and traders can recognize reality of the rainy season onions in them.

(7) Examination of cultivation methods by producers is useful for improving the cultivation methods.

In the process of the trial cultivation in the pilot activity, the producers said ideas to improve the cultivation method of rainy season onions based on their experiences including the cultivation of dry season onions. Since producers know conditions and climates of their areas, it may be effective to examine ideas of producers in each area and to reflect to improvement of the cultivation method.

(8) Technical instruction by a seed supply company is useful.

Seed supply companies of the rainy season onions have information about the cultivation methods of rainy season onions. Therefore, a staff of a seed supply company explained the cultivation method in the cultivation seminar of the pilot activity. The producers followed the explanation to cultivate the rainy season onions in the pilot activity. The results were relatively good. Therefore, it is suggested that technical instruction by a seed supply company is useful.

8.3.5 Feedback to the Promotion Plan

The lessons learned and opinions of the participants of the pilot activity are used for formulation of the promotion plan and necessary activities are introduced into the promotion plan. In addition, information is collected from producers of the rainy season onions that were not participated in the pilot activity to use it for the promotion plan.

(1) Use of the cultivation of rainy season onions as a promotion measure of onion to increase quantity of onions sold in the off-season

In addition to the area of the pilot activity, there are producers cultivating the rainy season onions in Sanmatenga province, Sanguié province, etc. They learned the cultivation methods of rainy season onions from seed supply companies, etc. a few years ago. Although the cultivation methods are different from each other, the producers in both areas can produce the rainy season onions and continue it since it provides enough profit. In the field days in the pilot activity, many producers were

interested in the cultivation of rainy season onions and wanted to start it. Therefore, the cultivation of rainy season onions can be accepted, contribute to increasing selling quantity of onions in the off-season and be used as a promotion measure.

(2) Establishment of a technical sheet of onions and continuation of trials to improve the cultivation techniques

The results of the trial cultivation show that the production of rainy season onions is improved by improvement of the cultivation method. Concrete methods improved are method of raising seedlings, shape of beds and fertilizer application method. However, difference of growth of onions was observed. It may be caused by difference of soil conditions. It became clear that adjustment of the cultivation methods is necessary based on the cultivation conditions. Therefore, additional trials and examinations are necessary for stable production of the rainy season onions. It is suitable for research institutes continue these trials and examinations. These activities are introduced into the promotion plan. Furthermore, a technical sheet is effective for extension of the cultivation techniques and usually technical sheets are established by research institutes. Therefore, establishing a technical sheet of the rainy season onions is introduced into the promotion plan.

(3) Improvement and adjustment of the cultivation techniques in demonstration cultivations and by producers

Since the producers in charge of the trial cultivation have experience of the cultivation of dry season onions, they had had ideas how to improve or adjust the cultivation method (adjustment of height of the beds, choice of suitable soil, etc.). Therefore, it is effective to support activities to examine local cultivation methods that are suitable for each area in addition to implementation of demonstration cultivation in target areas of the promotion plan. This activity is introduced into the promotion plan as an effective activity for technical extension and improvement of cultivation methods.

(4) Provision of information about the rainy season onions to traders

No constraints on sales of the rainy season onions are pointed out by producers and traders at present. In harvest season of the rainy season onions, from the end of September to November, a little onion that is remains of stored dry season onions are sold. However, the quality is not good and the size is small, 4 to 5 cm of diameter. According to traders, the rainy season onions are fresher than the stored dry season onions and the rainy season onions are in demand if the size is from 5 to 6 cm of diameter. Since there are market channels of the dry season onions between producers and traders (collectors in production area) it is possible to use the channels for sales of the rainy season onions. On the other hand, it is necessary to provide information about the rainy season onions to traders. Therefore, field days that were conducted in the pilot activity are introduced into the promotion plan. Interest of traders is increased by observing the production and getting information about the products (quality, etc.) in the field days.

8.4 Promotion Plan for Onion

8.4.1 Framework of the Promotion Plan

(1) Principle of Planning

Onions were selected as an agricultural product mainly for the domestic market. Therefore, the market oriented promotion plan mainly for the domestic market is formulated. It is to say that the plan to promote an agricultural product through meeting demands in the market is formulated. This promotion plan consists of mainly measures for the promotion issues mentioned previously and the overall goal is that the onion sales contribute to income improvement of the producers.

(2) Target Duration

The duration is 5 years from start of the implementation.

(3) Target Area

Although the onions are produced in the whole country and distributed in and around the country, the major production areas of onions are the target areas in this promotion plan. Therefore, onion production areas in Boucle du Mouhoun region, Nord region, Centre-Nord region, Centre-Ouest region, Centre region, Plateau Central region, Hauts Bassins region and Centre-Est region are the target areas.

(4) Vision

The onions are an important crop since the production quantity is the most in vegetables in Burkina Faso and they are exported to neighboring countries. The onions are cultivated mainly in the dry season. The selling quantity of domestic onions rises and the price goes down in harvesting season, from February to April. Although some parts of the domestic onions are sold after storing for 3 or 4 months, the selling quantity of domestic onions gradually decreases in the off-season, from May to November. In addition, the most quantity of onions produced in Netherlands and Morocco are imported and distributed to markets in Burkina Faso in November and December, when the onion price is high and the selling quantity is little,

Therefore, little selling quantity of the domestic onions in the off-season is the promotion issue for onions for the moment. The domestic onions sold in the off-season can replace the imported onions and contribute to reduction of the import quantity. Moreover, it is expected that income of the producers is improved through selling more onions in the off-season, in which the price is higher.

The market channels of dry season onions to neighboring countries exist and the onions are exported there actively. Furthermore, the selling quantity and the price are seasonally fluctuating in the neighboring countries as same as the domestic market. Therefore, the domestic onions would be able to be exported to the neighboring counties if the selling quantity increases in the domestic market in the off-season although the promotion plan is targeting the domestic market.

Therefore, the vision of this promotion plan is “To increase selling quantity of the domestic onions in the off-season (July to November) in Burkina Faso”.

(5) Goal

Assuming that onion consumption is 10 kg/capita/year¹⁷, the onion consumption in Burkina Faso is 13,750 tons/month (the population is 16.5 million people¹⁸). In addition, selling quantity of domestic onions in each month is estimated based on the production quantity in Burkina Faso in 2009 (329,319 tons) and the selling quantity of onions of producers in Korsimoro shown in the Fig. 8.2.1.

According to the estimation, the selling quantity per month in Burkina Faso from July to November is lower than the consumption quantity in Burkina Faso (13,750 tons/month). The total insufficient quantity is about 62,000 tons.

In the promotion plan, the goals are that the cultivation area of rainy season onions is increased to 25% of that of the dry season onions (about 3,300 ha or about 40,000 tons) and the storage capacity of about 3.5% of the production of dry season onions is newly added (about 11,500 tons). As a result, total about 51,500 tons can be sold in the off-season. The insufficient quantity is decreased to about

¹⁷ According to the FAOSTAT, there is no data of onion consumption of Burkina Faso. Therefore, the onion consumption of the world (10 kg/capita/year) was used for the estimation. The onion consumption of Niger and Senegal that are onion production countries in the West Africa is 18 to 20 kg/capita/year.

¹⁸ World Bank, World Development Indicators, 2012

19,000 tons in total. Moreover, a part of the domestic onions can be exported in November to the neighboring countries where selling quantity is low as same as Burkina Faso, since the selling quantity of domestic onions is more than the consumption quantity in Burkina Faso.

8.4.2 Promotion Strategies and Programs

The promotion strategies and programs to reach the vision above are shown below. Following the promotion measures mentioned in the section 8.2.2, the promotion strategies for onion are 1) Sales of onions in the off-season by the cultivation of rainy season onions and 2) Sales of onions in the off-season by the storage of dry season onions.

(1) Sales of Onions in the Off-season by the Cultivation of Rainy Season Onions (Promotion Strategy 1)

To realize the “Promotion strategy 1: sales of onions in the off-season by the cultivation of rainy season onions”, “program for sales of onions in the off-season by the cultivation of rainy season onions” is instituted. In this program, the following projects are implemented and the production and selling quantity of the rainy season onions are increased in the off-season.

1) Improvement of the Cultivation Techniques for the Rainy Season Onions

Trial cultivation of the rainy season onions was implemented in a few years ago by a donor. After that, seed supply companies have explained the cultivation method to producers. Actually, some producers produce and sell in small scale on trail at present. Therefore, there is plenty of scope for the extension. However, information about the cultivation of rainy season onions such as cultivation techniques, suitable areas and so on is not developed. Producers just started the cultivation in some areas with try and error based on the little information from donors and seed supply companies.

Therefore, INERA leads collecting information about present cultivation methods of the rainy season onions. Based on the collected information, improvement of the cultivation methods and suitable areas are examined. And then trial cultivations are conducted in major cultivation areas of onions in Burkina Faso to confirm the local adaptability and cultivation techniques of the rainy season onions. A technical sheet for the cultivation is made based on the results of trial cultivation. Simultaneously, evaluation by traders and possibility of sales of the products harvested in the trial cultivations are confirmed.

2) Extension of the of Rainy Season Onion Cultivation

Because of insufficiency of information about the rainy season onions, producers cannot cultivate them actively. Furthermore, traders need to know the production areas and the quality of rainy season onions to deal them.

Therefore, the cultivation of rainy season onions is extended by mainly MARHASA in major onion cultivation areas through providing existing cultivation techniques that seed supply companies have and the confirmed cultivation techniques in the above project to producers. In the beginning stage of project, the cultivation techniques that seed supply companies have are extended. After establishment of the technical sheet, trainings of the cultivation techniques are conducted for extension staffs. And then, the trained extension staffs instruct producers in the cultivation techniques through conducting demonstration cultivations and field days in each area. Moreover, information about growth situation, quality and quantity of the rainy season onions are provided to traders in the field days to extend the rainy season onions to traders.

Since low precipitation area is suitable for the cultivation of rainy season, the northern part of Burkina Faso has priority as a target area of the extension.

(2) Sales of Onions in the Off-season by the Storage of Dry Season Onions (Promotion Strategy 2)

To realize the “Promotion strategy 2: sales of onions in the off-season by the storage of dry season onions”, “program for sales of onions in the off-season by the storage of dry season onions” is instituted. In this program, storage capacity of dry season onions is improved and selling quantity of onions in the off-season increases through implementing the projects below.

1) Support for Establishment of the Onion Storehouses

Improvement of storage capacity is necessary for producers to store a part of harvested dry season onions to adjust selling period and quantity. Although suitable storehouses are necessary to store onions, it is difficult for producers to construct the storehouses by own funds since it is difficult for them to secure the construction cost.

Therefore, DGPER, donors and so on support establishment cost of the storehouses used by producers or producers unions. The number of storehouses is increased and the storage capacity is improved. As same as support system of PAFASP, owners of the storehouses defray a part of the establishment cost. Although type of the storehouse is generally shelf type, establishment of hut type storehouses is also supported in consideration with fund and production scale.

2) Extension of the Onion Storage Techniques

To improve the storage capacity, the storehouses should be used effectively with low storage loss in addition to establishment of the storehouses. In order to use them effectively, cultivation and harvest management is important as well as storage management.

Therefore, necessary information is collected and a technical sheet is made by INERA. And also, DGPER manages trainings for extension staffs and producers to extend the necessary knowledge and management techniques for storage in cooperation with INERA.

8.4.3 Projects

(1) Project for Improvement of the Cultivation Techniques for the Rainy Season Onions

1) Background and Objective

Technical sheet of the cultivation of rainy season onions is not available and the local adaptability is not yet clear. Therefore, some producers are taking try and error. Since suitable areas and methods for the cultivation are not clear, it is difficult for producers to consider starting the cultivation of rainy season onions. It is supposed that many producers hesitate to start the cultivation to avoid taking its risks.

Therefore, the objectives of this project are confirming and improving the cultivation techniques for making the technical sheet of the cultivation and confirming applicable areas for the cultivation. For these objectives, trials cultivation of the rainy season onions are conducted in onion producers' fields in major production areas of onions.

2) Target Area

Three areas in the major onion production areas that have different climate conditions (mainly precipitation) are the target areas. It is supposed that the target areas are Hauts Bassins region for high precipitation, Nord region for low precipitation and the north of Centre-Ouest region for the middle of both areas.

3) Stakeholders and Target Group

Stakeholders: INERA, DGPER, DRARHASA

Target group: Producers around the trial fields

4) Activities and Actors

Table 8.4.1 Activities and Actors of Project for Improvement of the Cultivation Techniques for the Rainy Season Onions

Activity	Actor	Contents of the Activity
1. Considering suitable areas and selecting fields for the trial cultivation	INERA, DRARHASA, DGPER	INERA collects information regarding cultivation results and cultivation methods from producers of rainy season onions in cooperation with DRARHASAs. Based on the collected information, INERA extracts areas in which producers have relatively good results and selects suitable areas for the trial cultivation in rainy season. On the selection of the suitable fields, both sides of drainage and supplemental irrigation should be considered from the topographical point of view.
2. Conducting the trail cultivation	INERA, DRARHASA	INERA conducts the trial cultivations in the selected suitable areas for the trial cultivation with producers and DRARHASAs. In the trial cultivations, cultivation techniques which effectiveness was confirmed in the pilot activity (raising seedlings, shape of beds, fertilizer application) are used. And also suitable sowing time is examined since precipitation and period of rainy season are different from area to area. PREMA178 and ALIZE are recommended as varieties to be used in the trial cultivation since the seeds are available in Burkina Faso and they were relatively reputable in the pilot activity. In the trial cultivation, information about the rainy season onions should be provided to the producers not only for the trials but also for those one living around the fields.
3. Considering possibility of sale	INERA	In the pilot activity, it was cleared that existing onion market channels can be used for sales of the rainy season onions. The producers of the trial cultivation try to sell the product. INERA considers possibility of the sale and the profitability of the rainy season onions based on the results of the sales. And also, results of the consideration are explained to the producers. Provision of information about the rainy season onions to traders are promoted through the sales of the products.
4. Establishing the cultivation guideline	INERA	INERA makes clear the suitable areas and cultivation methods based on the results of the trial cultivation. And then, INERA makes a technical sheet of the cultivation. If the cultivation methods are different from area to area, they are specified in the technical sheet.

5) Implementation Schedule

Table 8.4.2 Schedule of Project for Improvement of the Cultivation Techniques for the Rainy Season Onions

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year
1. Considering suitable areas and selecting fields for the trial cultivation	INERA				
2. Conducting the trail cultivation	INERA				
3. Considering possibility of sale	INERA				
4. Establishing the cultivation guideline	INERA				

6) Expected Effectiveness

Suitable areas and the cultivation methods are cleared by making a technical sheet of the rainy season onions. Conditions of the technical extension are improved and producers can get information easier.

(2) Project for Extension of the Rainy Season Onion Cultivation

1) Background and Objective

INERA established a technical sheet for the cultivation of dry season onions and extension staffs of MARHASA are technically supporting the producers based on the technical sheet. Although the extension and technical support for the cultivation of rainy season onions are not conducted actively, expectation of producers were large in the pilot activity. Therefore, objectives of this project are extending the cultivation of rainy season onions and increasing the production in major onion production areas by using the technical sheet made in the above project and seed supply companies that effectiveness was confirmed in the pilot activity.

2) Target Area

The target areas are major onion production areas that are selected as suitable areas in the above project. It is supposed at present that the priority areas are Nord region, Centre-Nord region, Boucle du Mouhoun region and the north of Centre-Ouest region, Plateau Central region, Centre region and north of Centre-Est region in which precipitation is relatively low.

3) Stakeholders and Target Group

Stakeholders: DGPER, DGPV, DRARHASA, INERA and Seed supply companies

Target group: Onion producers in the target areas

4) Activities and Actors

Table 8.4.3 Activities and Actors of Project for Extension of the Rainy Season Onion Cultivation

Activity	Actor	Contents of Activity
1. Conducting trainings for extension staffs	INERA, DGPV	INERA conducts trainings in CRREA and CREAM for extension staffs belonging to ZATs and UATs in areas of the CRREA and CREAM. It is supposed that CRREAs in Saria (Koudougou) and Di (Tougan) conduct the trainings.
2. Conducting demonstration cultivations	DGPER, DRARHASA DGPV Seed supply companies	Seed supply companies or the extension staffs attended the trainings conduct demonstration cultivations in their areas in cooperation with producers under management of DGPER and DRARHASA. If necessary, the extension staffs request assistance to INERA or DGPV for the demonstration cultivation of rainy season onions in producers' fields. The demonstration cultivations are conducted in 3 fields in each province for 2 years. If necessary, the fields are changed by year. In addition, field days that effectiveness was confirmed in the pilot activity are conducted. They are conducted twice in a year in each demonstration field to explain the cultivation method and the growth situation to producers and traders around the demonstration fields. Since necessity to provide information to traders was confirmed in the pilot activity, participation of traders such collectors in production area should be promoted. In the pilot activity, it was suggested that experience and knowledge of cultivation of producers could be used for improvement of the cultivation methods. Therefore, opinions of producers regarding improvement of the cultivation methods are collected and they are reflected to the demonstration cultivation next year.
3. Technical support for producers	DRARHASA, Seed supply companies	The seed supply companies or the extension staffs provide technical support on the cultivation to producers who individually start the cultivation of rainy season onions, if necessary.

5) Implementation Schedule

Table 8.4.4 Schedule of Project for Extension of the Rainy Season Onion Cultivation

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Conducting trainings for extension staffs	INERA					
2. Conducting demonstration cultivations	Seed supply companies DRARHASA					
3. Technical support for producers	Seed supply companies DRARHASA					

6) Expected Effectiveness

The cultivation methods of rainy season onions are extended and the rainy season onions are cultivated in about 3,300 ha. As a result, selling quantity of domestic onions from September to November is increased by about 40,000 tons.

(3) Project for Support for Establishment of the Onion Storehouses

1) Background and Objective

Storing onions in storehouses that are cultivated in dry season is a suitable method to sell onions in the off-season. For this purpose, establishment of onion storehouses for producers has been promoted by support of donors. Although the PAFASP reported that the storage capacity in Burkina Faso became about 5,000 tons, it is estimated that additionally 28,000 tons of storage capacity is required to meet domestic onion consumption in the first half of the off-season. Producers have recognized necessity and importance of the storehouse since the storage makes it possible for the producers to sell the onions at high price. Therefore, demand of the storehouses is high. However, the construction by producers has not been proceeding well, since it is difficult for producers to secure the construction cost. Therefore, objective of this project is improving storage capacity by increasing number of the storehouses with supporting the establishment cost for the producers.

2) Target Area

The target areas are areas where production quantity of the dry season onions is large since the storehouses are used for storing the dry season onions. It is supposed that the target areas are Boucle du Mouhoun region, Nord region, Centre-Nord region, Centre-Ouest region, Hauts Bassins region, Plateau Central region, Centre region and Centre-Est region.

3) Stakeholders and Target Group

Stakeholder: DGPER, DRARHASA, INERA, Producers' unions

Target group: Onion producers in the target areas

4) Activities and Actors

Table 8.4.5 Activities and Actors of Project for Support for Establishment of the Onion Storehouses

Activity	Actor	Contents of Activity
1. Confirming standard of the storehouse	DGPER	DGPER confirms a standard of the onion storehouse by referring to a storehouse supported by PAFASP. PAFASP supports establishing two types of storehouses that are shelf type and hut type. This project also adopts same two types. If necessary, the standards are improved in consultation with INERA.
2. Selecting the beneficiaries	DRARHASA, DGPER	Producers request the storehouse support to DRARHASA through producers' unions. Extension staffs of ZATs or UATs assist the producers in the procedure of the request. Providing place for the storehouses and defraying 20% of the construction cost are conditions of the producers to be supported. DRARHASA selects the producers to be supported after confirming that the requesting producers can meet their conditions. If the requests are over than the budget, DRARHASA adjusts the implementation schedule such as allocating the construction of some storehouses to several years. And DRARHASA reports the results to the producers' unions and DGPER. The types of storehouse (shelf or hut type) are selected based on the production scale of producer.
3. Establishing the storehouses	DRARHASA, DGPER	DRARHASA manages the construction of the storehouses for the selected producers. DRARHASA selects constructors and supervise the construction. The supported producers (beneficiaries) pay their shares through necessary procedures. Based on the report from DRARHASA, DGPER suitably ensures the budget, disburses the fund and monitors the progress. Using 2KR counterpart fund is the one of options as a fund source of the supporting construction cost.

5) Implementation Schedule

Table 8.4.6 Schedule of Project for Support for Establishment of the Onion Storehouses

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Confirming standard of the storehouse	DGPER					
2. Selecting the beneficiaries	DRARHASA					
3. Establishing the storehouses	DRARHASA					

6) Expected Effectiveness

By the establishment of storehouses, the storage capacity of onion increases by about 11,500 tons. As a result, selling quantity of dry season onions from July to September is increased by about 11,500 tons.

(4) Project for Extension of the Onion Storage Techniques

1) Background and Objective

If onions are stored under appropriate condition, they can be kept around 4 or 5 months and the loss is less than 20%. However, the loss is about 50% and the storage period is about 3 months if they are kept under inappropriate condition. Appropriate management and techniques of the storage are necessary to use effectively the storehouses established in the above project and to increase the benefit and the selling quantity in the off-season. Therefore, objective of this project is clarifying

techniques and knowledge needed on the cultivation and storage of dry season onions and extending them to producers.

2) Target Area

The target areas are same as that of the above project of support for establishment of onion storehouses.

3) Stakeholders and Target Group

Stakeholders: DGPER, DRARHASA, INERA

Target group: Holders of onion storehouses in the target areas and beneficiaries of the above project of storehouses

4) Activities and Actors

Table 8.4.7 Activities and Actors of Project for Extension of the Onion Storage Techniques

Activity	Actor	Contents of Activity
1. Establishing a technical guideline for onion storage	INERA	INERA collects important notes on cultivation and storage, appropriate techniques, management methods etc. that contribute reduction of loss in storage. Based on the collected information, INERA makes a technical sheet of onion storage. Example of the information to be collected are fertilizer application, irrigation, harvest and selection of the products, etc. on the cultivation and ventilation, piling method of onions, removing damaged onions etc. on the storage.
2. Conducting trainings for extension staffs	INERA, DGPER	INERA conducts trainings in CRREA and CREAM for extension staffs belonging to ZATs and UATs in the areas of CRREA and CREAM. In this training, the technical sheet of onion storage is explained.
3. Conducting trainings for producers	DRARHASA, DGPER	The extension staffs attended the trainings conduct trainings of onion stage for producers under management of DRARHASA. If necessary, the extension staffs request assistance to INERA or DGPER for the trainings. The technical sheet of onion storage is explained and distributed to the producers. If necessary, samples of net bag for packing onions are provided.

5) Implementation Schedule

Table 8.4.8 Schedule of Project for Extension of the Onion Storage Techniques

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Establishing a technical guideline for onion storage	INERA					
2. Conducting trainings for extension staffs	INERA					
3. Conduction trainings for producers	DRARHASA					

6) Expected Effectiveness

The appropriate storage techniques for onions are extended to producers and onions are stored effectively with 10 or 20 % of the storage loss.

8.4.4 Implementation Structure and Project Cost of the Promotion Plan

(1) Implementation Structure

Mainly DGPER, DGPV, DRARHASA and INERA concern implementation of the promotion plan for onion. The 2 programs are implemented through conducting stakeholders meeting, sharing information and opinions that managed by DGPER. Supposed members of the stakeholder meeting are DGPER, DGPV, INERA, DRARHASA, producers' unions, traders' unions, seed supply companies, donors and so on. As demand arises, DGPER requests supports to donors and the Burkina side implement the promotion plan on the initiative in combination with the supports.

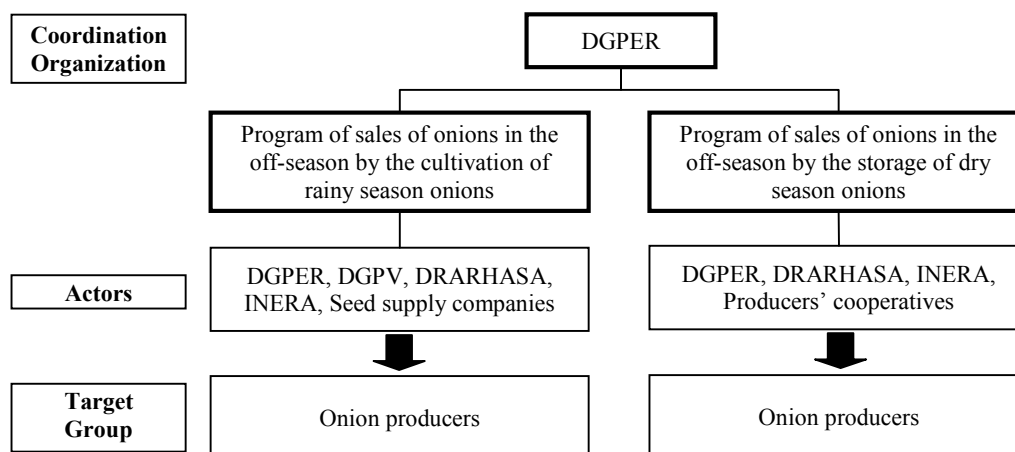


Fig. 8.4.1 Implementation Structure of the Promotion Plan for Onion

(2) Important Notices on the Implementation

The 2 programs in the promotion plan can be implemented simultaneously. On the implementation of each program, the followings should be taken notices.

1) Program for Sales of Onions in the Off-season by the Cultivation of Rainy Season Onions

- a) INERA implements trial and improvement of the cultivation techniques. In addition, INERA makes technical sheets of cultivation and storage and provides them to DGPER and DGPV.
 - b) DGPV promotes activities regarding extension of cultivation techniques of the rainy season onions. Since the production meeting market needs are required in the market oriented promotion, DGPER regarding harvest and sales and DGPV should closely share information and cooperate with each other.
 - c) DRARHASA implements extension activities for producers and traders in the target areas in cooperation with DGPER, DGPV and INERA.
 - d) Making the technical sheet, it should be taken notice that the technical sheet can be used for extension as soon as possible. Therefore, the first version should be made by using results of the trial cultivation with existing information as much as possible.
 - e) Extending the cultivation, it should be promoted by using information that seed supply companies have so that the extension activities can be started before making the technical sheet. After making the technical sheet, trainings of the cultivation with the technical sheet are provided to extension staffs in the target areas. Based on the trainings, the extension staffs extend the cultivation techniques to producers.
 - f) In the extension to producers, cultivation methods adapted to local conditions should be
-

examined and the cultivation techniques are adjusted and improved through demonstration cultivation and field days. In addition, DRARHASA feeds back information about the adjustment and improvement of cultivation techniques to INERA for revising the technical sheet.

2) Program for Sales of Onions in the Off-season by the Storage of Dry Season Onions

- a) DGPER promotes activities of this program.
- b) INERA makes a technical sheet of onion storage and provides it to DGPER.
- c) DRARHASA conducts extension activities of storage techniques and activities regarding support for establishment of storehouses for producers in the target areas in cooperation with DGPER and INERA.
- d) The establishment of onion storehouses is supported based on requests from beneficiaries. The support procedure of PAFASP should be referred.
- e) The extension of the onion storage techniques starts from making a technical sheet. And then, trainings for extension staffs and trainings for producers are implemented.

(3) Project Cost

The project costs of this promotion plan for onion are shown in the table below.

Table 8.4.9 Estimated Project Cost of the Promotion Plan for Onion

[Unit: FCFA]

Project	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
Improvement of the Cultivation Techniques for the Rainy Season Onions	670,000	4,950,000	4,950,000	6,450,000		17,020,000
Extension of the Rainy Season Onion Cultivation	57,760,000	71,750,000	71,750,000	85,570,000	63,050,000	349,880,000
Support for Establishment of the Onion Storehouses	820,000	866,300,000	866,300,000	866,300,000	866,300,000	3,466,020,000
Extension of the Onion Storage Techniques	540,000	18,100,000	18,100,000	6,480,000	6,480,000	49,700,000
Total	59,790,000	961,100,000	961,100,000	964,800,000	935,830,000	3,882,620,000

* Allowance and transportation fee of MARHASA officials and hired staffs are included. Their salaries are not included.

8.4.5 Conclusion

- (a) In the off-season of the domestic onions, the selling quantity gradually decreases and the price goes up. On the other hand, import quantity increases in the off-season. The import quantity tends to increase in recent years. However, the domestic onions are more preferable to the import onions for consumers and needs of the domestic onions are high in the off-season.
- (b) Through the pilot activity, it became clear that the rainy season onions could be cultivated and sold in the off-season. Moreover, it was confirmed that the cultivation techniques were acceptable for the producers. They could cultivate the rainy season onions and get income. The producers and traders were interested in the rainy season onions. On the other hand, it became clear that examinations and improvement of the cultivation techniques were still necessary for higher yield and stable production.
- (c) The vision of the promotion plan for onion is to increase selling quantity of the domestic onions in the off-season (July to November). As the promotion measures, extension of the cultivation of rainy season onions and improvement of the storage capacity of dry season onions in production areas of the dry season onions are planned. Goals of the plan are that the rainy season onions

produced about 40,000 tons in a year and the storage capacity of dry season onions is increased by about 11,500 tons in the last year. Total about 51,500 tons of onions are sold in the off-season. In addition to the increase of the selling quantity of domestic onions in the off-season, the monthly selling quantities in November are more than the monthly consumption quantities in those months. Therefore, the domestic onions can be exported to the neighboring countries, where the selling quantity of onions is low as same as Burkina Faso, through existing market channels.

- (d) In the implementation of the promotion plan, information of organizations concerned is shared in the stakeholders meeting and DGPER coordinates them. In addition, DGPER takes responsibility for implementing the improvement of storage capacity. INERA takes responsibility for conducting the trial cultivation and collecting and providing technical information. DGPV takes responsibility for extending the cultivation techniques.
- (e) It is concluded that the implementation of the promotion plan based on demand of the domestic market contributes to development of the onion sector and improvement of income of the producers.

ADDITIONAL DATA

1. Export and Import Data

STATISTIQUES D'IMPORTATIONS ET D'EXPORTATIONS Import Quantity of Onion of Burkina Faso

Unit: ton

Country	2009	2010	2011	2012
Côte d'Ivoire	932	0	291	16,375
Ghana	38	65	0	28
Togo	0	33	750	750
Bénin	0	0	191	0

Source: Directorate of Custom of Burkina Faso (provided in June 2013)

STATISTIQUES D'IMPORTATIONS ET D'EXPORTATIONS Export Quantity of Onion of Burkina Faso

Unit: ton

Country		2009	2010	2011	2012
Pays-bas	Netherlands	207	621	451	960
Côte d'Ivoire	Côte d'Ivoire	648	884	263	169
Ghana	Ghana	0	0	0	186
Maroc	Morocco	0	0	0	267
Mali	Mali	0	0	10	22
Niger	Niger	652	693	612	278
Sénégal	Senegal	0	0	38	0
Afrique du Sud	South Africa	0	0	0	27
Chine	Chine / Hong Kong	84	29	0	33
Espagne	Spain	0	0	0	7

Source: Directorate of Custom of Burkina Faso (provided in June 2013)

Trade Map Import Quantity of Onion of Cote d'Ivoire

Unit: ton

Cote d'Ivoire	2009	2010	2011	
Netherlands	64,932	58,924	62,237	
France	959	1,173	734	
Other EU countries	1,453	1,341	117	
Niger	1,425	2,958	4,194	
Burkina Faso	0	0	316	
Egypt	4,686	4,356	1,978	
Morocco	0	23	85	
South Africa	0	0	57	
Other countries	1,357	51	64	
Total	74,812	68,826	69,782	

Source: Trade Map, Importation statistics from reporting countries (As of June 2013)

Trade Map
Import Quantity of Onion of Ghana

Unit: ton

Ghana	2010	2011	2012	
Netherlands	28	28	56	
Belgium	224	800	1,040	
Côte d'Ivoire	25	1,002	802	Seems to be re-export
Niger	47,133	56,593	44,855	
Nigeria	0	0	3	
Togo	27	53	268	
Benin	0	0	166	
Burkina Faso	3,602	16,848	24,986	
China	1,809	2,430	2,332	
Other countries	2,087	4,274	4,264	
Total	52,849	77,768	74,542	

Source: Trade Map, Importation statistics from reporting countries (As of June 2013)

Trade Map
Import Quantity of Onion of Togo

Unit: ton

Togo	2009	2010	2011	
Netherlands	40	0	59	
Other EU countries	14	0	0	
Ghana	0	158	0	Seems to be re-export
Niger	1,372	1,162	38	
Nigeria	43	19	0	
Benin	781	592	262	
Burkina Faso	1,026	1,605	4,828	
China	30	6	0	
Other countries	13	0	0	
Total	3,319	3,542	5,187	

Source: Trade Map, Importation statistics from reporting countries (As of June 2013)

Chapter 9 Model for Domestic Market: Soybean

9.1 Analyses on Present Situation

Africa has a short history of soybean cultivation. Soybeans have been exclusively cultivated for cash crop and distributed and exported for processing materials of feed and food due to absence of customs to eat soybeans themselves¹.

9.1.1 Target Markets

The value chain varies depending on organic soybeans, ordinary soybeans and destination markets. They are summarized as follows.

Table 9.1.1 Target Market for Burkina Faso Soybeans

Type	Market	Consumer	Soybean-processed Products
Organic Soybean	EU (France)	Feed Processor	Soy-cake (oil), Roasted soybeans
	Burkina Faso	Processed-Food Processor	Food for infants (Misola*)
Ordinary Soybean	Sub-region	Feed Processor	Soy-cake (oil), Roasted soybeans
		Processed-Food Processor	Soumbala**, Soya milk, Tofu, etc.
	Burkina Faso	Food Processing Processor	Soumbala, Soy brochettes, Soya milk, Tofu, Yoghurt, Soy flour, Infant nutrition food, etc.
		Roasting Processor	Raw material for feed (poultry and pigs)
		Industrial Goods Processor	Soy-cake, Oil (feed)
		Feed Processor	Formula feed

Source: JICA team

*Misola is commercial name of food for infants (in addition to flour of soybean, peanut and millet, sugar, salt and vitamins are added).

** Soumbala is traditional fermented food made from seeds of leguminous tree (Nélé).

*** Soy brochette is small fried solid tofu s with flavor on skewer.

The reliable statistical data on volume of soybean import/export (ton and amount) in Burkina Faso and data on distribution volume by usages in the domestic market and annual prices changes are not available. Furthermore, data on soybean production volume and on information of distribution and export in the sub-region countries are very limited.

(1) Organic Soybean Market

There are two distribution channels for organic soybeans. The first one is the export to French market and the second one is supply of processing material for infant nutrition food “Mosila”. The initiatives of international NGOs (including associations) and contract farming are its particularities.

1) EU Market (French)

Organic soybeans are exported at present to France under the two channels described below.

i) BKB Burkina – BKB France

The association of BKB (Breizh Kengred Burkina) located in Brittany province, France, in collaboration with association Solidarité Burkina-Bretagne (abbreviation: BKB Burkina)², exported 200 tons of organic soybeans in 2012 to Brittany province. France BKB is willing to import at least 6,000 tons per year. The shortage of demand is made up currently by importation from India. The imported organic soybeans are processed for oil and feed (soy-cake and roasted).

¹ Contrary to the other beans, soybeans are prevented from direct consumption due to their hardness even by cooking. Originally, it is because variety to consume beans themselves was not introduced.

² BKB Burkina has applied for authorization as cooperative but until 28 October 2013 official approval has not been granted.

ii) HELVETAS—former ESOP³—Gebana Afrique

HELVETAS plans to export organic soybeans (rotation crop for organic cotton), which are produced in Tenkodogo (Centre-Est) and in Diébougou (Sud-Ouest), to France in collaboration with Gebana Afrique in 2013 as pilot business. The two former ESOP in Diébougou and Tenkodogo are in charge of cultivating organic soybeans in the two (2) areas. On the other hand, Union Nationale des Producteurs Cotonniers du Burkina Faso (UNPCB) is responsible for acquisition of organic farming certificate while HELVETAS supports UNPCB for its acquisition.

Demand for Soy- based Food in EU Market

The demand for soy-based food (including organic soybeans) beside for feed is high in EU market. For instance, the market survey report “Soy-based Products in Western Europe” prepared by Ministry of Agriculture and Agri-Food of Canadian government in December 2011 summarizes as follows.

- a) All soy-based products, with the exception of soy sauce, are part of the broader health and wellness market.
- b) In 2010, Belgium was the largest Western European market in terms of per-capita value consumption of soy-based products with 7.8 USD, followed by Spaniards consumed the most soy-based products in volume terms in 2010 (142.8 million liters of soy-based dairy products and 13,300 tones of other soy-based products), Norway (6.7 USD) and Spain (6.5 USD). France was the largest market for soy-based products in terms of value sales, and is forecast to remain as such. The French market for soy-based products is expected to reach 445 million USD in value in 2015.
- c) The main distribution channels for soy-based products in Western Europe were supermarkets and hypermarkets, mostly through retailers such as Carrefour, Auchan, Tesco, Metro Group and Schwarz Group.

The sales value of soy-based products in Western Europe grew by 46.4% from 2005 to 2010, Spain being the fastest-growing market for that period with 152.1%. The Western European market is forecast to grow by 19.2% for the total 2011-2015 period.

2) Domestic Market

According information collected at this point, only “Association Song Koadba” (ASK) (Oubritenga province, Plateau Central region), cowpea producers association, cultivates organic soybeans and supplies them to “Guipomgou” (assisted by an Italian NGO Medicus Mundi Italia) which processes “Misola” in Ziniaré. Italian NGO, Lvia (Association de Solidarité et de Coopération Internationale), has been implementing project with duration of January 2013 to December 2014. The 250 members (men and women) of ASK cultivate organic soybeans, millet and maize, in farm with 0.5ha each since 2013.

(2) Ordinary Soybean Market

The distribution channels of ordinary soybeans are divided into export to the sub- region countries and consumption in the domestic market. Considering the current development situation of soybeans processing industries in Burkina Faso, ordinary soybeans are limited in exports for the time being. The end users in the domestic market are animal breeders and food consumers, but consumption volume for feed material is much higher.

³ ESOP (Entreprise de service et organisation des producteurs) is created as private company (limited liability) by support of local NGO of APME2A (Agence pour la promotion des petites et moyennes entreprises, Agriculture et Artisanat). All of ESOPs are liquidated in 2014 due to financial difficulty but all of their businesses are not suspended.

1) Sub-regional Markets

i) Demand in Sub-regional Countries

The demand of livestock products, especially for meats and eggs, has been increased due to the increase of national income and urbanization in the sub-regional countries.⁴ It has therefore contributed significantly to increased demand of soybeans for feed. Burkina Faso soybeans are exported to fill the gap between demand and supply in the neighboring countries.

a) Soybean Import in Sub-regional Countries

The import volume of soybeans, soybean flour and soybean oil in the sub-regional countries (Ghana, Cote d'Ivoire, Togo, Benin, Niger, Nigeria) for 2008-2012 in ton base by use of Trade Map data are shown in the table below.

Table 9.1.2 Soybean Import Situation in Sub-regional Countries (2008—2012)

Soybean	Import Volume (ton)				
	2008	2009	2010	2011	2012
Ghana	4,399	197	168	108	26
Cote d'Ivoire	0	0	210	0	-
Togo	48	164	281	0	0
Benin	0	0	0	26	12
Niger	0	2	0	0	98
Nigeria	334	64	1,845	15,531	-

Source: Trade Map

Ghana and Nigeria import a lot of soybeans in the sub-regional countries. Nigeria imports a lot of soybeans from the world largest exporting countries, Brazil, Argentina and America. Ghana imports from the sub-regional countries such as Togo, Korea, Canada and European countries and some year import a lot from America, India and Argentina. For the sub-regional countries which imports of soybeans from Burkina Faso were recorded are only Ghana, in 2007 (95 tons), in 2009 (190 tons), in 2010 (143 tons)⁵.

Table 9.1.3 Soybean Flour Import Situation in Sub-regional Countries (2008—2012)

Soybean Flour	Import Volume (ton)				
	2008	2009	2010	2011	2012
Ghana	10,772	841	516	10,339	6,618
Cote d'Ivoire	1,397	3,118	470	1,864	-
Togo	-	-	-	-	-
Benin	23	0	71	0	0
Niger	1,650	0	0	100	35
Nigeria	172	652	1,168	372	-

Source: Trade Map

Ghana and Cote d'Ivoire are the countries which imports a lots of soybean flour. They import from South Africa, America, Italia and Belgium. Ghana may use them for food processing and feed.

⁴ According to Human Development Report 2013 (UNDP), Ghana population is about 26 millions, 52.2% for urban population, US\$1,684 for purchase power parity (PPP). Ivory Coast population is about 21 millions, urban 52.0% for population, US\$1,593 for PPP.

⁵ Trade Map

Table 9.1.4 Soybean Oil Import Situation in Sub-regional Countries (2008–2012)

Soybean Oil	Import Volume (ton)				
	2008	2009	2010	2011	2012
Ghana	2,757	2,462	3,367	4,088	2,809
Cote d'Ivoire	915	523	563	1,487	-
Togo	68	13	2	117	366
Benin	295	387	20	59	223
Niger	217	12	837	24	17
Nigeria	0	1,803	500	5	-

Source: Trade Map

b) Trade Volume for Major Business Transaction

Soybean trade chain can be divided into three types based on interviews with producers, middleman, grain wholesalers and exporters. The situation depending on business transaction is described below in order to complement data in a) above.

[Type 1]: Traders in the neighboring countries come and purchase from Burkina wholesalers and exporters

Malian and Ghanaian traders buy 50 to 60 tons at one transaction of soybeans from wholesalers and exporters in the “Sankara market” and hire trucks for transporting to their countries. The interviewed one company sold 10 times to 6 Ghanaian traders and 20 times to 15 Malian traders in 2012. So soybeans were exported by one company 500 to 600 tons to Ghana and 1,000 to 1,200 tons to Mali⁶ in 2012. In Ghana soybeans are processed for soy milk and oil and soybean are processed for roasted beans and Soumbala in Mali.

[Type 2]: Soybeans are exported by Burkina grain exporters after receiving orders from the importers which have business relations in the neighboring countries

A grain exporter in “Sankara market” has started exporting soybeans upon receipt of order from oil extracting company in Saint Pédro, Côte d’Ivoire. It exported 1,000 tons in 2012 by trucks. As the annual trading volume is increased, it is considered that demand for feeding materials is also increased. Another grain exporter in “Sankara market” exported 564 tons of soybeans to Abidjan in 2012 by railway. The imported Soybeans are processed for soy milk, oil and feed. The two exporters have exported 1,564 tons of soybeans to Côte d’Ivoire in 2012. As shown in Fig. 9.1.1, soybean cultivation area in Côte d’Ivoire is limited.

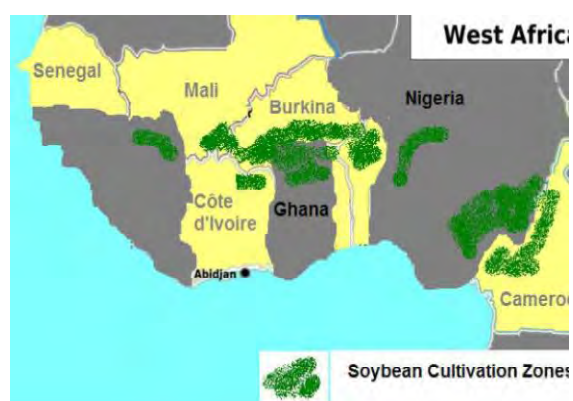


Fig. 9.1.1 Soybean Cultivation Zone in West Africa

Source: World Initiative for Soybean in Human Health (WISHH) Midwest Workshop 2009

[Type 3]: Traders in the neighboring countries directly come and purchase in Burkina Faso production areas

Traders from Benin, Togo and Ghana constantly come and purchase from the farmers in major

⁶ According to this company, traders of the neighboring countries come and purchase Burkina soybeans because they contain higher fat and protein. As indicated in Fig. 9.1.1, soybeans are practically not cultivated in Mali.

production areas, Fada-N’Grouma in Est region as well as Tenkodogo, Oualgay, Cinkansé, Bittou and Zaburé in Centre-Est region. Ghanaian traders also come and purchase in Léo (Centre-Ouest) and in Pô (Centre-Sud region). They have come to Sissili (Centre-Ouest region) since 2009 to procure 200 to 500 tons every year, so that price has become higher.

There is another example of the largest scale formula feed processing company (Faso Grain) in Burkina Faso. The company procures annual 2400 tons of soybeans mainly from Tenkodogo, and the rest from Pô, Léo, Banfora and Gaoua. However, the company is difficult to supply volume of orders from Côte d’Ivoire including FOANI SERVICE (feed processing company) which requested for 100 - 400 tons per month.

ii) Production and Yield in Sub-regional Countries

The table below shows data of production (ton) and yield per ha (kg/ha) of the sub-region countries (Côte d’Ivoire, Mali and Benin) from 2004 to 2013.

Table 9.1.5 Production and Yield per Ha in the Sub-regional Countries (2004 -2013)

Production (ton)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cote d'Ivoire	872	300	653	705	700	829	871	887	1,000	1,000
Mali	2,500	2,124	2,004	5,188	1,937	1,874	1,871	1,900	2,000	1,850
Benin	5,525	9,190	4,347	14,711	5,937	9,235	18,000	13,000	15,000	16,000
Burkina Faso	2,473	6,500	5,860	5,850	29,209	15,686	22,394	23,056	24,305	21,773

Yield (kg/ha)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cote d'Ivoire	807	750	1,088	881	1,077	1,228	1,056	950	1,053	1,053
Mali	1,736	1,717	1,603	1,215	621	627	688	679	667	673
Benin	543	805	784	823	427	576	1,000	765	789	842
Burkina Faso	1,155	1,099	1,142	1,125	2,729	1,454	1,256	887	1,095	1,351

Source: FAOSTAT

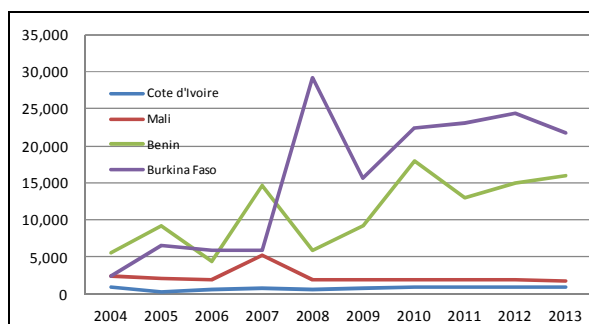


Fig. 9.1.2 Production (ton) of Sub-regional Countries

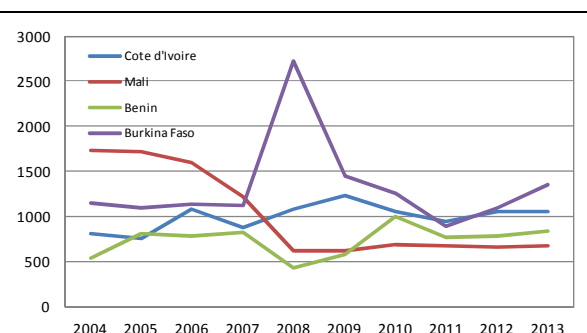


Fig. 9.1.3 Yield (kg/ha) of Sub-regional Countries

Source: FAOSTAT

Note: (1) The production of Burkina Faso in 2005 was 10,067 tons in DPSAA and 6,500 tons in FAOSTAT. (2)The yield of Burkina Faso with 2,729kg/ha for 2008 in FAOSTAT must be wrong.

Even though data are limited, yield and production of Burkina Faso has been higher than that of the sub-regional countries (Côte d’Ivoire, Mali and Benin) since 2008.

iii) Soybean Price in Sub-regional Countries

The following table indicates the unit prices of soybeans of Burkina Faso in January 2009. The soybeans of Burkina are competitive with West African countries in terms of price except with Mali.

Table 9.1.6 Soybean Unit Price in West African Countries (January 2009)

Unit : USD/MT	Ghana	Côte d'Ivoire	Mali	Bénin	Nigeria	Cameroun	Burkina Faso
	500	680	400	800	590	600	455

Source: Soy in West Africa (Michael Martin) WISHH Midwest Workshop 2009

Soybean retail prices on the local markets in November 2013 in Ghana and Côte d'Ivoire were shown below⁷. However, the trade volumes in local markets are very low in the two countries.

Table 9.1.7 Soybean Price in Ghana and Côte d'Ivoire (November 2013)

	Accra (Ghana)	Abidjan (Côte d'Ivoire)
Retail price	2.8 GCE/kg (about 632 FCFA/kg ⁸)	600 FCFA/kg
Selling type	Selling by plastic bag	Selling by tin

Source: Interview in fields

The purchasing price of Faso Grain (formula feed processor) from middleman in Tenkodogo, etc. is indicated as follows. (Interviewed on 6 October, 2013)

Table 9.1.8 Change of Purchasing Price of Soybean (2013)

Period	Nov. to Jan.	Feb. to Apr.	May to Jun.	Jul. to Aug.	Sept. to Oct.
Purchasing Price	190 FCFA/kg	200 FCFA/kg	210 FCFA/kg	215 FCFA/kg	230 FCFA/kg

Source: Faso Grain

As demand for soybeans of Burkina Faso is high in sub-region countries and competitive enough in terms of its price, it is judged that export of ordinary soybeans will be continued for the time being supported with the lively demand.

iv) Use of Soybean Processing in Sub-regional Countries

There are the countries in the sub-region which conduct soybean processing in industrial manner and they are described below⁹.

- Nigeria: there are more than 60 soybean processing companies including small to large ones. The large companies like Nestle and Cadbury sell soybean processing products and the consumers like them. More than 140 kinds of soybean processed food, soy milk, yogurt, flour, biscuit, infant food, seasonings, cereal foods, have been manufactured. Nigeria is the most populated country of soybean processing food in West Africa.
- Ghana: The manufacturing mills such as oil extraction and soybean cake are constructed.
- Cote d'Ivoire: The manufacturing mills such as oil extraction, soybean cake and feed processing are constructed.

As seen in the three countries above, even though soybeans are new crop in Africa, the countries which are taken roots have cultivated soybeans in the countries and contributed to development and promotion of related industries. Seeing Nigeria as an example, the reasons that soybean processing food is comparatively prevailed earlier are that the government has promoted the production, and made steady efforts for dissemination with other related institutions like IITA. Even in Africa, soybeans are becoming strategic crop.

⁷ The survey results of the Study team in November 2013.

⁸ Exchange rate is calculated with 1EURO = 2.90 GHC = 655 FCFA.

⁹ HELVETAS (2009), ETUDE FILIERE SOJA RAPPORT

Situation of Ghana

(Utilization)

- Soybeans are cultivated for cash crop and utilized as industrial crop. Soybeans are mainly used for poultry feed (soy-cake for laying hen) and soy oil are used for food and printing ink.
- There are no transaction by variety and no difference in price by variety (feed and oil extraction companies don't require specific variety).
- Roasted soybeans for poultry feed by distributors are not practiced.
- Soybean flour mixed up with flour of other cereals (weaning food), soybean flour, and soybean milk (in bottle or tetra pack) are sold in supermarkets for soybean-processed products.
- Annual consumption per capita in 2012 was 2.0 kg (51,820 tons in total) (Agriculture in Ghana 2012).

(Production and Cultivation)

Table 9.1.9 Soybean Production in Ghana (2007 - 2012)

	2007	2008	2009	2010	2011	2012
Farming area (ha)	46,801	61,824	77,250	76,220	85,938	85,200
Production (ton)	49,778	74,794	112,830	145,935	164,511	151,709
yield per ha	1.06	1.21	1.46	1.91	1.91	1.78

Source: Statistics, Research and Info. Directorate (SRID), Min. of Food & Agriculture – Ghana

- Mainly small-scale farmers are growing soybeans. The Northern region is the main cultivation area producing 80% of the total production (2012).
- Cultivation is only during rainy season. Sowing in May-July, harvesting in October-November, mainly mixed cultivation with maize.
- The main varieties are Jenguma, Salentuya-1, Salentuya- 2, etc. (cultivation periods of 110 to 120 days are relatively long).
- The country's needs for feed and oil extraction are estimated at 0.5 million ton and are not met (Ministry of Agriculture of Ghana).
- The system of government fixed purchasing price was removed in 2013 (farm gate price in 2012: 60.00 GHC/100kg¹⁰)
- Organic soybeans are not cultivated.

(Monthly Price Fluctuation)

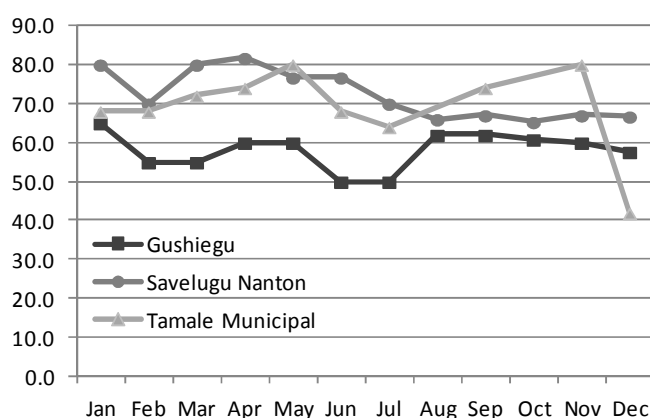


Fig. 9.1.4 Monthly Soybean Price in 2012 (GHC/100kg)

Source: Statistics, Research and Info. Directorate (SRID), Min. of Food & Agriculture – Ghana

¹⁰ Using exchange rate of 1 EURO = 2.90 GHC = 655 FCFA, it will be calculated at 13,552 FCFA/100kg.

2) Domestic Market

Soybeans distributed in the domestic market are consumed by i) ordinary consumers/producers, ii) food processing processor, iii) roasting processor, iv) industrial goods processor and v) animal feed processors. Except ordinary consumers and producers, the other consumers procure individually soybeans in the production areas.

i) Ordinary Consumers and Farmers

According to interview with the contract producers of former ESOP in Léo, a few quantity of soybeans are utilized for home consumption as Soumbala, Couscous (mixed up with flour of maize) and steam fritters (mixed up with water and steamed). The distribution volume of soybeans in domestic cereal market is very low. According to interview with trader in Kaya cereal market, ordinary consumers purchase soybean for materials to make Soumbala, soy brochette and infant nutrition food.

ii) Food Processing Processor

Food processing processors are divided broadly into two types, tofu related food processors and infant nutrition food processors. There are also two types of tofu related food manufactures, ones processing with modern equipment provided by NGOs financial support, etc. (Soja Santé and association DJIGUI ESPOIR) and another ones such as cottage industries and women groups processing with handwork. The first ones import coagulant (CaSO₄), packing materials (vacuum-pack) and labels and so on from France. Their processing foods are tofu, soy milk, fried tofu and soy brochette. The cottage industries and women groups, which are the majority of food processing Processor, process not only soy brochette (major product), soy milk, yoghurts, Soumbala and soy flour but also other cereal processed products. As soybean processed food are manufactured upon receipt of orders and displayed in trade fair, etc., they are still considered unstable income sources.

There are Misola network, SODEPA and FASO RIIBOS as Processors of infant nutrition food. In regard to Misola, Processors should join in the network and should be trained by the network. The final products for Misola are packed with packages provided by the network and are supplied to middleman in Ouagadougou (sales at pharmacies, etc.) and to nutrition improvement projects (example: CREED project).

iii) Roasting Processor

The soybean roasting processors roast soybeans and supply them as raw materials mainly for poultry feed as well as livestock. There is former ESOP, “Prodiali S. A. Nutritions” (cottage industry starting operation in July 2013) and so on as major soybean roasting processors. The demand for roasted soybeans has been rapidly increased because of high prices of imported fish meals and bad quality of local fish meals¹¹. Roasted soybeans can be stored for a long time. The roasted soybean are processed into poultry feed mostly by individual poultry farmers. Chicks of poultry farming in Burkina Faso are all imported.

iv) Industrial Goods Processors

Industrial goods indicate oil and soy cake after the extraction. There is oil extracting company in Bobo-Dioulasso and the company SIATOL in Ouagadougou as larger scale processors and sale companies in Burkina Faso. SIATOL is the private company created in October 2012. The former ESOP group (65%), partners (25%), APME2A (5%) and Gebana Afrique (5%) are

¹¹ Maison De L'Aviculture (MDA) sells industrial fish meals (import) at 52,500 FCFA/50kg and traditional fish meals (locally made) at 16,000 FCFA/50kg in August 2013.

shareholders¹².

According to WFP (world food program) in Burkina Faso, the annual demand of CSB (Corn-Soya Blend) in food aid to Burkina Faso are 1,300 tons for vulnerable people and 3500 tons for school food/refugees but all CSB are procured in the international market at present. It is therefore desirable to locally manufacture CBS in Burkina Faso.

v) Animal Feed Processors

There are more than 15 companies manufacturing formula feed in Burkina Faso¹³. The company “Faso Grain” (created in 2011), one of large scale processors in the country, has processed feed for poultries, goats, sheep, horses, bovines, pigs, etc.. The company procures at least 120 tons of soybeans per month, of which 60 tons are used for processing formula feed and 60 tons are resold to other processors of formula feed, poultry farmers (meat and eggs) and animal breeders. Considering the present production capacity and demand, soybeans for raw materials are obviously insufficient. The impurity (sand and stones) are mixed in procured soybeans at the rate of 6 to 10%. Cleaning activities are not conducted by the collectors at the production areas.

The basic combination ratio of animal feed in the company is indicated below. There is a distinguishing characteristic that soybean oil is mixed. Fish meal, minerals and calcium are all imported.

Table 9.1.10 Combination Ratios and Raw Material (Faso Grain)

Component	Combination Ratio	Raw Material
Carbohydrate	over 50%	Maize, Sorghum, Millet and Rice
Protein	20 - 30%	Roasted soybeans, Peanut, Cotton meal, Soy meal and Fish meal
Fat	0.3%	Soybean oil
Calcium	10 - 20%	Freshwater oyster shells
Others	0,5%	Vitamins, Amino acid, etc.

Source: Faso Grain (6 October 2013)

Modern poultry farming, feed processing and demand of soybean feed are stated below in Burkina Faso.

a) Poultry Business: MDA (Maison De L'Aviculture)

MDA is established in 1998 as national organization for the purpose of contribution to development of modern poultry farming in Burkina Faso. At present, 250 poultry farmers are registered in MDA around the capital Ouagadougou. 205 farmers out of 250 are small scale with 1,000 chickens, 28 medium scales with 1,000-4,000 chickens and 17 larger scales with more than 4,000. MDA brunch is created in Bobo-Dioulasso with about 250 members.

b) Feed Processing Business

According to Faso Grain, formula feed processors using soybeans and soy-cakes and their consumption are the followings.

¹² By setting up Chinese oil extraction facilities in 2012, 2,500 tons of daily production capacity, this company has started its full-scale operation but the refining is entrusted to GEMOL (cotton oil manufacturer).

¹³ Interview with Maison De L'Aviculture (MDA) (August 2013)

Table 9.1.11 Major Feed Processing Industries

Name	Location	Consumption of Soybeans	Consumption of Soy-cake
Faso Grain	Ouagadougou	120 tons/month	-
Ferme Avicole Tapsoba et frères	Ziniaré	30 tons/month	-
MDA (Maison de l'aviculture)	Ouagadougou	15 tons/month	-
Ferme Yenadogo	Ouagadougou	15 tons/month	-
MOABRAOU*	Ouagadougou	-	40 tons/month

* It breeds 62,000 layers and processes their fed by itself. It procures 15-20tons of soy cake from soybean oil extraction company SIATOL out of 40 tons which are consumed per month.

c) **SOFAB (SOCIETE DE FABRIQUE D'ALIMENTS POUR BETAIL: Feed Production Company)**

This company has large scale feed processing mill which production capacity is designed at 100,000 ton per year in Burkina Faso. The mill is located in Koubri and started its operation in April 2014. It is planned to proceed 30,000 tons of feed in 2015. The company is joint-stock company but about 90% of stocks are hold by the fund created by Ministry of Animal Resources. The president is also the adviser for the Ministry. In order to produce 100,000 tons of formula feed per year, 30,000 tons of soybeans are necessary. Currently the company procures soybeans from individual collectors. There is shortage of soybeans in Burkina Faso in off-season, so that it becomes difficult to procure in the country. In this case, procurement from the international market is considered but if custom duty consumption tax and transportation cost are added, they became more expensive that Burkina Faso soybeans. SOFAB prefers direct procurement from the production farmers without middlemen.

d) **Demand for Soybean Processed Feed**

The continuous increase of demand for soybean based feed is prospected since poultry farming is expected to be grown as shown in the following Fig. 9.1.5¹⁴. Especially demand of feed for layers is larger.

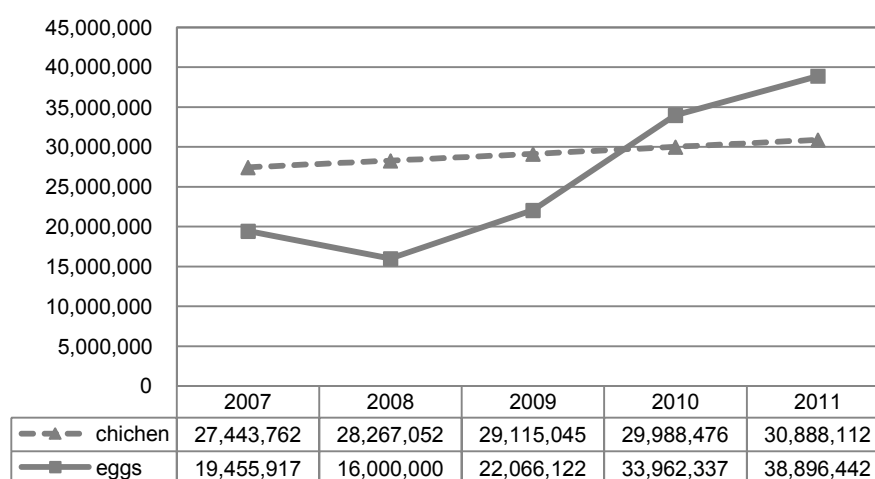


Fig. 9.1.5 Changes of Number of Chicken and Egg Production (2007-2011)

Source: "Agriculture and Forestry in Burkina Faso", JAICAF (March 2013)

Furthermore, it is expected that soybean consumption will be increased in the future due to prospect of high rate of population growth (about 3.1% in 2006 national census) and of

¹⁴ The most popular areas of poultry farming are in Centre-Ouest region, Boucle de Mouhoun region and Hauts-Bassins region which are account for 41.3% of total number of poultry in 2011.

urbanization in the country¹⁵.

9.1.2 Cultivation and Production

Soybeans production has started, for the beginning, with supports of NGOs and government of Burkina Faso in a small scale for substitute of Soumbala and materials of infant nutrition food, and afterward has been increased receiving growing demand.

(1) Production Area

Soybeans are not cultivated in the regions of Sahel, Nord and Centre-Nord under Sahel climate zone (annual average rainfall of 300-600 mm).

The top 10 provinces in soybean production for 10 years from 2002 to 2012 are shown in figure below.



Fig. 9.1.6 Major Soybean Production Provinces

Source: JICA team

As shown in the table below, total production in top 10 provinces accounts for about 92% of the total national production during the period 2002 - 2012. Especially, Boulgou province and Tapoa province are account for 48% in the total national production.

¹⁵ During the period 1997-2009, annual population growth rate in Centre region in where the capital Ouagadougou is located is at about 6 % and that of Hauts Bassins region in where the second largest city Bobo-Dioulasso is located is at about 3.6%. (JICA report on formulation of detailed design plan)

Table 9.1.12 Total Production in Top 10 Provinces (2002-2012)

	Province	Region	Total (ton)	%
1	Boulgou	CENTRE-EST	36,787	24.3%
2	Tapoa	EST	35,355	23.4%
3	Koulpélgo	CENTRE-EST	23,274	15.4%
4	Sissili	CENTRE-OUEST	14,432	9.5%
5	Kompienga	EST	6,443	4.3%
6	Gourma	EST	6,092	4.0%
7	Nahouri	CENTRE-SUD	5,932	3.9%
8	KénéDougou	HAUTS-BASSINS	4,140	2.7%
9	Ioba	SUD-OUEST	3,579	2.4%
10	Zoundweogo	CENTRE-SUD	2,769	1.8%
	Sub-total		138,802	91.7%
	Others		12,524	8.3%
	Whole country		151,326	100.0%

Source: DPSAA

The main production areas are divided into the two distinguishing areas. The one is traditional production areas in the regions of Est and Centre-Est and the other one is cotton cultivation area in the regions of Centre-Oues, Centre-Sud and Hauts-Bassins.

The production of soybeans has been significantly increased in cotton cultivation area as crop for rotation. Taking an example of Sissili province, the production has been increased by more than 20 times from 21 tons in 2003 to 4,250 tons in 2012.

(2) Production Volume

The Fig. 9.1.7 shows the change of national soybean production (ton) from 2002 to 2012.

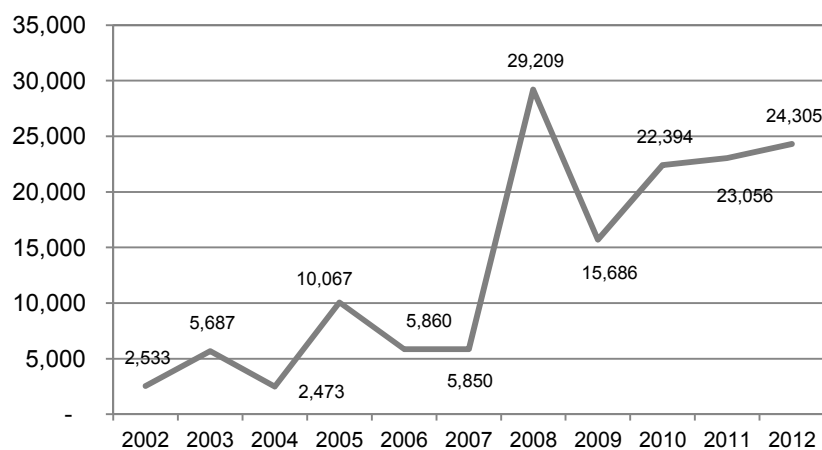


Fig. 9.1.7 Changes of National Soybean Production (2002-2012)

Source: DPSAA

The annual national production has increased by 9.6 times from 2,533 to 24,305 tons in the period.

The reasons of this considerable increase are 1) increase of domestic consumption (animal feed and raw materials for food processing), 2) replacement crop for cotton and crop rotation and 3) increased demand in the neighboring countries (Ghana, Côte d'Ivoire, etc.), 4) distribution of soybean seeds with free of charge by MARHASA since 2008.

(3) Producers and Cultivation Type

Soybean is cultivated once a year by small-scale farmers during rainy season either by single cropping or mixed cropping with major food crops. According to interviews with the farmers in Fada-N'Grouma, Tenkodogo and Léo, most of the farmers have cultivation area of 0.25-1.0 ha and their yield per ha are less than 1.5 tons.



Farm in Sissili Province
(single cropping)

1) Cultivation Method

According to DPSAA statistics, average single cropping rate at national level (parentages of total single cropping production against total national production) was 54.0% (1,369 tons) in 2002 and 64.5% (15,682 tons) in 2012. Comparing with the rate of single cropping for cowpea of 16.2% in 201, the rate of single cropping for soybean is much higher.

The single cropping rate in 2013 of top 10 provinces in the total national production (2002-2012) is about 40% for Boulgou, about 52% for Taporas and about 59% for Koulpélgo which are located in the traditional cultivation areas. On the contrary, single cropping rate of Sissili province is about 86% and Nahouri province is about 99%, where are located in cotton production areas, are much higher (DPSAA). It is observed that soybeans are cultivated in cotton production area for replacement of cotton or for crop for rotation. The soybeans are cultivated with maize line by line for mixed cropping in Sissili province. The farm is divided into four (4) plots and sorghum, soybean, maize and millet are cultivated in each plot for crop rotation by shifting every year.

2) Cultivation Calendar¹⁶

The cultivation schedule differs to rainfall. Sowing period is between July 1st and 15 in the area where rainfall varies from 750 to 1,000 mm and is from June 15 to 25 in the area where rainfall varies from 1,000 to 1,400 mm. After the rainy season starts, when the ground becomes wet, seeds are sown by putting 2 seeds in a hole with depth of 2 to 3 cm at interval of 40cm x 20cm (30 to 35kg/ha). The seeds are germinated in 5-7 days after sowing.

In case of using compost and chemical fertilizers together, 3 tons/ha of compost should be applied after plowing and 50 kg/ha of NPK (14-23-14) after weeding in 21 days after sowing, and 25 kg/ha of urea in 15 days after NPK fertilization. When compost is not using, 100 kg/ha of NPK (14-23-14) should be applied after weeding in 21 days after sowing and 50 kg/ha of urea in 45 days after sowing.

The first inter-tillage weeding should be conducted in 15 days after sowing and weeding are conducted afterward if necessity. Insecticide such as Decis is applied for pest control (spray solution mixed with 20 liters of water and 40 ml of Decis per ha). The damage caused by disease and insects for soybeans are not severe compared with that for cowpea and cotton. According to the producers, labor input for soybeans is less required than that of cowpea, and farm working such as weeding is same as cowpea and minimum fertilizer are required even though the cultivation period is longer¹⁷.

3) Utilization of Agricultural Inputs

i) Agricultural Equipment

The agriculture equipment is not generally used by the farmers. Local hand hoe (daba) and spade (irreel) are mostly used. Equipment for plowing, hilling and weeding by draft animal (donkey and

¹⁶ According to INERA information and farmers interviews

¹⁷ HELVETAS and APME2A (2009) "SOYBEAN INDUSTRY SURVEY"

ox) and tractors for plowing are used but few farmers have such equipment. The agriculture equipment is lent to the farmers if necessary¹⁸.

ii) Fertilizer and Chemicals

There are some producers (example: contract farmers for former ESOP) applying poultry manure and cow manure (let cow eat the residual of maize and let cow dung). According to the interviews with farmers, there are no producers applying chemical fertilizers due to high price and a few farmers using chemicals.

iii) Certified Seeds

The farmers who are not contract producers use mostly ordinary seeds through home seed-raising, procurement in markets and purchase from the other farmers due to higher price and smaller quantity in supply of certified seeds. There are many production farmers who are impossible to expand cultivation area due to lack of seeds.

4) Division of Farm Working by Gender

The farm working for production and post-harvest for soybeans, which are cash crops, are mostly conducted by men in Sissili province, major soybean production area. Women assume a part of the farm working (especially farm working by manual).

Table 9.1.13 Division of Labor by Gender in Soybean Cultivation and Post-Harvest in Sissili Province

	Plowing	Sowing	Weeding	Fertilization	Chemicals	Harvest	Threshing etc.	Transportation	Sales
Men	⊙	○	○	⊙	⊙	○	○	⊙	⊙
Women	○	○	○	No	No	○	○	No	○

Source: Interview with former ESOP in Leo

In production stage, men have responsibility for work which needs knowledge and heavy labor such as plowing, fertilization and spraying chemicals while work requiring labor and time such as sowing, weeding and harvesting are conducted by men and women. In post-harvesting stage, men and women conduct jointly threshing and impurity management but men assume transportation which requires heavy labor. For sales of soybean, men are responsible unless women group cultivate soybeans. Women are in charge of selling soybeans in cereals markets.




(4) Cultivation Variety and Seed Production

1) Seed Variety

The seed varieties cultivated in Burkina Faso are four varieties as listed in the table below. The most prevailing variety is G197. The G197 has characteristics of higher fat constituent and yield per stem.

¹⁸ Plowing: 15,000 FCFA/ha with draft animal, hilling with draft animal: 15,000 FCFA/ha, rental of tractor: 25,000 FCFA/ha in Sissili province (November 2013).

Table 9.1.14 Soybean Varieties and Characteristics

	G121	G196	G38	G197
			None	
Variety	Santa Maria	ISRA 26-26-72	Ilini	ISRA 44A73
Origin	Venezuela	Senegal	Portugal	Senegal
Seed Skin Color	Black	Yellow	Yellow	Yellow
Weight (1000 seeds)	80 g	85 g	85 g	120 g
Yield (ton/ha)	2 - 3	2 - 3	2 - 3	2 - 3
Necessary rainfall (mm)	750 - 1,000	750 - 1,000	600 - 750	750 - 1,000
Length of Main Stem (cm)	50	55	50	55
Cultivation Period (day)	100 - 105	100 - 105	90	90 - 100
Protein Constituent (%)	34	37	N/A	35
Fat Constituent (%)	18	18	N/A	23

Source: INERA

INERA recommends that the farmers should conduct fungicidal treatment before sowing in the farms. It should be mixed powder of 50 g of Montez 45 WS or Calthio with 5 kg of seeds in the bag. In fact, there are some cases that the producers use this treatment with Calthio before sowing.

2) Development of Seed Variety

The development of seed variety has carried out in Kongoussi of INERA. Currently, breeding test for 20 Nigerian seed varieties are conducted aiming at higher yield and larger seeds in Kongoussi. On the other hand, former ESOP Léo (Sissili province in Centre-Ouest region) has conducted breeding test for TGX variety of Togo, higher fat constituent, in collaboration with American Peace Corps.

3) Seed Production

Table 9.1.15 indicates production changes of original seeds (G1) and certified seeds (R1) from 2001 to 2009.

The seed multiplication organizations such as INERA and ATTRAB/B (Association pour le Transfert de Technologie Agricole dans le Boulgou) have produced certified seeds (R1) and sold to the farmers at price of 750 - 1,000 FCFA per kg¹⁹. The supply volume of certified seeds (R1) is very low. To this end, certified seeds (R1) have procured from INERA and distributed to the farmers or seed multiplication groups have created and multiplied certified seeds (R1) by BKB Burkina, Lvia, Soja Santé and former ESOP, etc.

Table 9.1.15 Changes of Production for Certified Seeds (2001-2009)

Year	Original Seed (t)	Certified Seed (t)
2001	1.8	0.0
2002	2.9	16.7
2003	0.9	11.6
2004	3.6	0.7
2005	10.0	97.6
2006	4.0	114.5
2007	-	83.8
2008	-	81.8
2009	-	85.5

Source: Table3-8 in the report of survey on information collection and confirmation of agricultural sector by JICA

¹⁹ Sandrine Audrey ZONGO (2013) "ANALYSIS OF SOCIOECONOMIC IMPACT OF THE COMPANY OF SERVICES AND ORGANIZATION OF PRODUCERS (ESOP) OF LEO ON SOYBEAN PRODUCERS OF THE PROVINCE OF SISSILI"

(5) Post-Harvesting and Storage

Soybeans sown from June 15 to July 15 are harvested in 90 to 100 days later from mid-September to early November in case of G197. Here, the table below shows work processes from harvesting and storage and their contents for cultivation land of 1 ha (interviews in Kulpelogo province, Centre-Es region).

Table 9.1.16 Working Processes and Contents from Soybean Harvest to Storage (1 ha)

Process	Number of Worker	Necessary Time	Contents
Harvesting	1 man, 2 women	From 6 O'clock to 12 O'clock	Use a hoe (daba) to cut bottom of stem of dried soybeans one by one. It is the hardest work. It takes 4 days for 1.5ha. (Case of former ESOP Léo).
Drying	1 person	3 days	Dried soybeans are generally left on the farms for 20 days since farmers work lastly for soybeans after finishing all the necessary work for other food crops.
Threshing	10 persons	From 9 O'clock to 12 O'clock	Threshing is conducted by hitting with sticks etc. on the farms. The damaged loss by threshing is less than 3 kg per ton. Even if soybeans are broken, they can be used for Soumbala.
Winnowing	10 persons	1 hour (minimum)	Impurities are removed by dropping soybeans from at level of man's head. Work in the farm.
Impurity Management	10 persons	3 to 4 days	Impurities are manually removed a number of times as clean as possible. It may take a day or a few hours depending on work for other crops. Work in the farm.
Storing	-	-	Plastic bags and sandbags are used for storing and they are kept in the house store. There are no damages of insects and disease.

INERA recommends the following 3 methods in order to avoid damages of insects and disease for storage.

- To mix pesticide (K'Othrine, Percal M, Djarama, Super Actellic) with 50 kg of soybean,
- To put 50 kg of soybean in double plastic bags with a tablet of Phostoxin and then shut tightly the bags,
- To use triple bags (Purdue Improved Cowpea Storage: PICS) designed for cowpea storage.

However, few farmers follow the treatments above. Generally, dried soybeans are just stored in ordinary plastic bags. Contrary to cowpea, soybeans can be kept longer in storage.



Harvesting



Soybeans after Harvesting



Soybeans Collected



Cleaning Process of Soybeans



Soybeans after Cleaning for Storage



Soybeans Stored (about 11 months)

9.1.3 Value Chain

(1) Trade Chain

The trade chain for soybeans is shown in the figure below. This is drawn based on the collected information at this point.

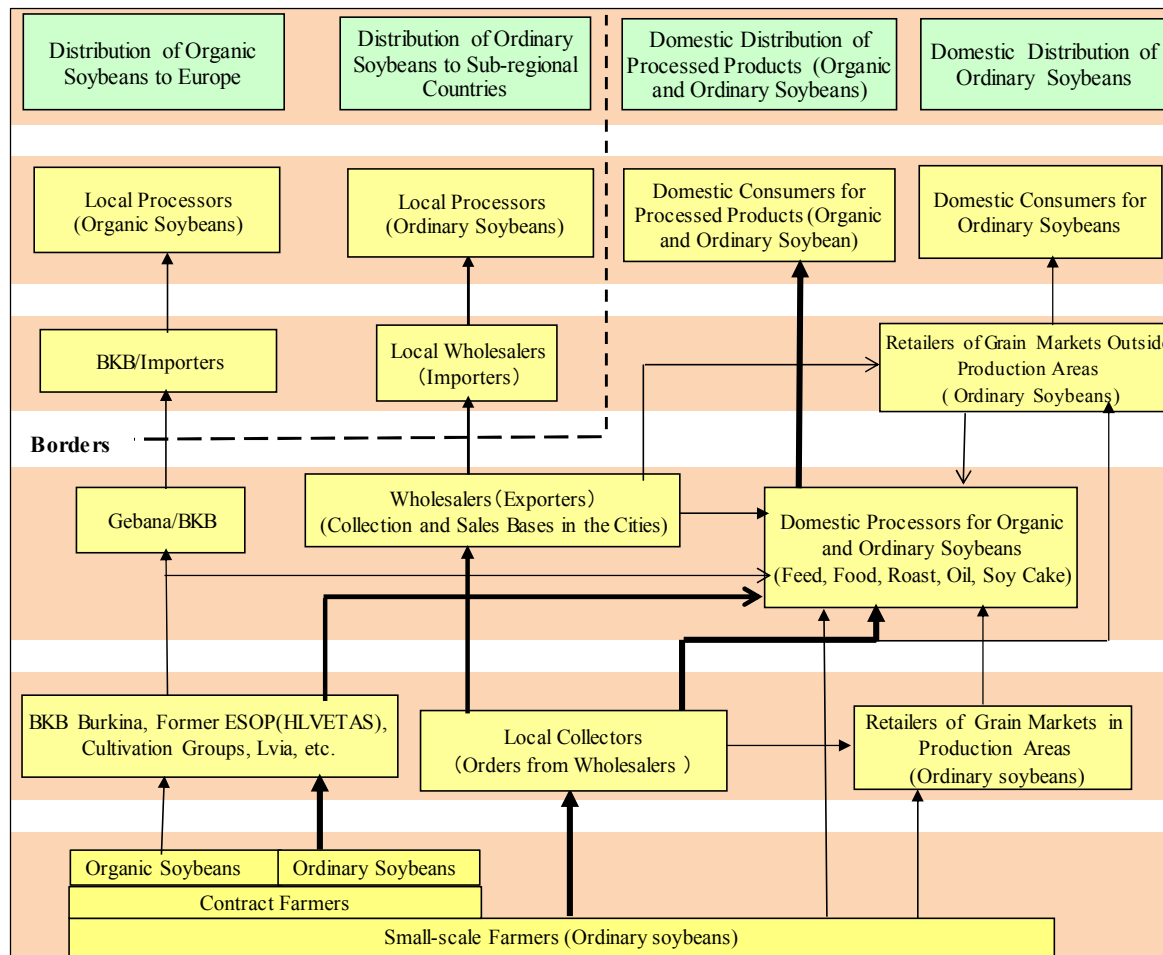


Fig. 9.1.8 Trade Chain for Soybean

Source: JICA team

The trade chain for Burkina Faso soybeans is broadly divided by organic soybeans and ordinary soybeans, and out of two (2) chains the domestic processing chain is the largest.

1) Organic Soybean

The trade chain for organic soybeans is consisted of exportation to France and distribution in the domestic market. The export channel of organic soybeans is the exportation to France for materials of animal feed by two production-export set-ups of BKB Burkina-BKB France and HELVETAS-former ESOP-Gebana Afriques through contract cultivation with the farmers. BKB France has promoted to expand import volume of organic soybeans by increasing production in Burkina Faso since current export volume is insufficient to meet demand of Bretagne province. Furthermore, it is expected in the future that export of organic soybeans not only for animal feed but also for soybean processed food will be expanded since consumption of soybean-based food in EU market has significantly been increased.

In regard to the domestic organic soybeans, stable market has been secured for raw materials of Misola through contract farming supported by NGOs. However, there are specific issues for organic

soybeans on lower yield (kg/ha) and setting of purchasing price against risen price of ordinary soybeans. The advantages of cultivating organic soybeans have become lower as the price of ordinary soybeans has rapidly risen.

2) Ordinary Soybean

The trade chain of ordinary soybeans is consisted of 3 channels, namely sales of soybeans in retail market in the country and raw materials for feed and food in the domestic market and sub-regional markets. The first channel is that production farmers and general consumers buy soybeans, process at home and consume soybean processed food, but its consumption is extremely limited.

The channel for raw material of animal feed, for high protein and inexpensive materials of animal feed taking over fish meals, has rapidly expanded in receipt of high demand of livestock products, especially for meats and eggs, due to the increase of national income and urbanization in the neighboring countries and in the country. The soybeans are therefore actively bought and sold sub-regional wide due to significantly growing feed demand in the sub-regional countries and in the countries. On the other hand, there is shortage of soybean supply in the domestic market for animal feed. It is prospected further increase of demand in the future as animal breeders become to understand advantages of low price and high protein of soybeans.

The issues of soybean for animal feed are absence of quality standards, insufficiency of impurities management, high transaction costs in collection and distribution due to small quantity production by small scale farmers, difficulty in preparation of enough purchasing cash for collectors, high custom duty on imported raw materials for animal feed (including chicks), inexistence of business organizations for animal feed and absence of technical standards on formula feed and roasted soybeans, etc..

Another channel for value chain of ordinary soybeans is soybeans for raw materials for food processing. The small volume of ordinary soybeans is exported to the neighboring countries for raw material of food processing (soy milk, Soumbala, oil, etc.).As processing and marketing of soybean-based food are the new field except for Soumbala and support from Burkina government and donors is still insufficient, the consumption volume in the domestic market is still limited in comparison with animal feed. Also, the volume of soybeans for food processing is much lower than that of soybeans for animal food. In order to develop soybean processing business in the future, it is indispensable to stimulate and expand consumption of soybean processed food by the general public as well as to sensitize advantages of high nutrition and healthy food for soybeans through mass media and school education. Women groups and cottage industries are account for the majority of soybean processed food business but they have little knowledge and experience since soybeans are the new crop for them. For that reason, there are problems in a few varieties of products, absence of utilization of high protein by-products, necessity of much labor inputs in working process, insufficient utilization of protein, low respect to hygiene maintenance, absence of secure market, insufficient networking among soybean processed food business, etc.

3) Domestic Processing-Good Consumption Chain

This chain is the largest chain in soybean trade chains, and as shown below is divided in to food processing chain and feed processing chain by kind of good. The value adding activities for each chain is explained later. The consumption volume of organic soybean processed food in the country is very small.

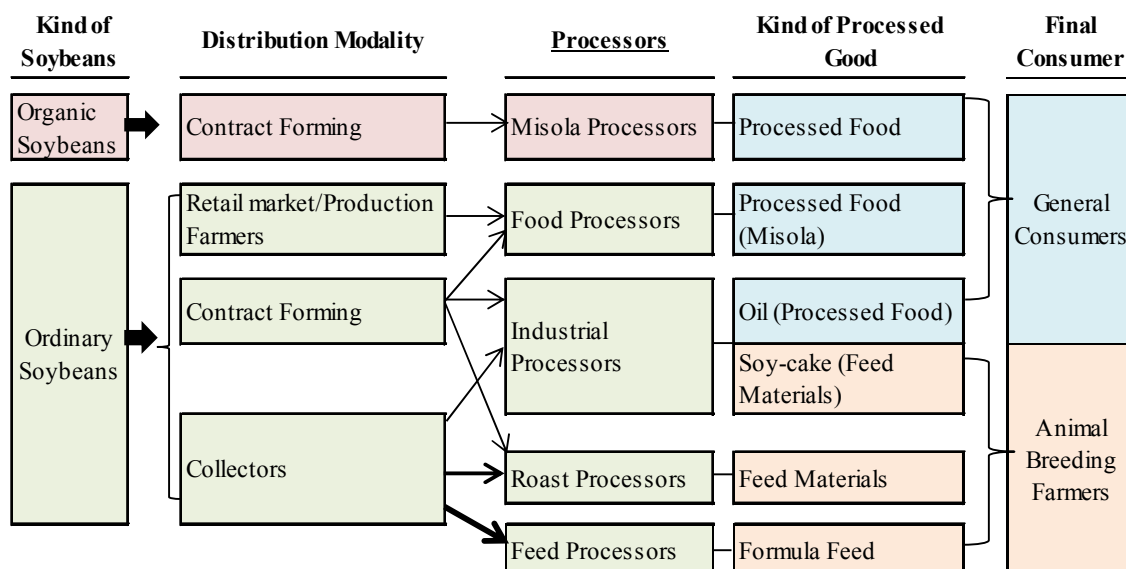


Fig. 9.1.9 Type of Domestic Processing-Good Consumption Chain

Sources: JICA team

The processors of roasted soybeans, animal feed processors and industrial product processors (oil and soy cake) procured soybean through middleman in the production areas. However, former ESOP (roasted soybean processors) and SIATOL (oil extracting company) procure soybeans from the contract farmers. The soybean processed food processors procure soybeans mainly from local retail markets and the production farmers in the production areas and retail markets in the cities. But Soja Santé (tofu processor) procures soybeans collected from the contract small scale farmers. There is also case that “Misola” processors procure organic soybeans from entrusted farmers for production.

The final consumers in the country for processing chain for organic and ordinary soybeans are general consumers of soybean processed food (Soumbala, soy brochette, oil, Misola, etc.) and animal breeders and poultry farmers who purchase feed material (roasted soybean, soy cake, tec.).

(2) Production Farmers

The most of soybeans production farmers are small scale farmers and are divided into general production farmers and contract farmers. The contract farmers are divided into organic soybean growers and ordinary soybean growers.

The production cost of contract farmers with former ESOP in Léo in 2012 was as follows.

Table 9.1.17 Production Cost of Contract Farmers with Former ESOP in Léo (2012)

Income	Expenditure
Average cultivation land: 0.40ha	Production Cost per kg 50 - 75 FCFA
Average yield: 1,200 kg/ha	
Purchasing Price :195 FCFA/kg	
Sales Amount for Average Farmer: 93,600 FCFA	Expenditure of Average Farmer: 24,000 - 36,000FCFA
Gross Income for Contract Farmer (0.40ha): 57,600 - 69,600 FCFA	
Gross Income per kg for Contract Farmer (0.40ha): 120 - 145 FCFA	

Source: Interview with former ESOP in Léo (13 November 2013)

The cost estimation above considers that former ESOP collects soybeans directly from cultivation

farms²⁰ and that include incentive fee (5 FCFA/kg) for conformity with technical standards.

There are a few farmers conducting seed disinfection with Montaz 45WS or Calthio before sowing and applying chemicals, but these costs are not included in cost estimation above.

In production and cultivation stage, soybeans are easily cultivated but rainfall influence considerably to sowing period and yield. Furthermore, yield is not high enough due to difficulty in accessing to certified seeds and agricultural inputs. It is difficult to expand cultivation area because of lack of agricultural materials. It is also difficult to increase the production in response to growing demand of markets because of competition of land use and distribution of labor input as the cultivation period is overlapped with the other food crops and cash crops. To this end, single cropping farmers put priority on cultivation of food crops (maize, sorghum and millet) because of labor shortages, and mixed cropping farmers tend to slovenly cultivate soybeans. Also, it is many cases that they cannot produce due to lack of seeds if they want to cultivate rotation-crop of cotton.

As such, there are various problems for the production farmers in low and uncertainty of yield due to dependence on rain-fed farming, lack of agriculture inputs and certified seeds, difficulty of expansion of cultivation area, competition of agriculture land use and distribution of labor. Further, on expanding cultivation area of the production farmers, they face the problems of sales risk such as insufficient information of buyers and prices. From now on, in order to increase production meeting increased demand, it is necessary to introduce cultivation techniques for improvement of productivity, to expand cultivation area and to reduce the sales risk. Moreover, it is necessary from a long-term prospect to develop drought tolerance varieties, early-ripening varieties and specific varieties by usage for animal feed and food processing, in addition to introduction of varieties by INERA on higher yield and larger seeds. Several contract farmers of former ESOP in Léo try to reduce workloads by using specific maize variety which cultivation period is shorter than soybeans in order to avoid competition with food crops. As workloads for plowing and sowing are so severe that the farmers are unable to cultivate more than 1 – 1.5ha per household unless problems of lack of agriculture inputs and labor are solved even though there is arable land (5ha).

(3) Exporters for Organic Soybean²¹

With respect to the export by the arrangement under BKB Burkina-BKB France, the fourteen (14) producer organizations in the country (Banfora, Mangodara, Manga, Tapoa, Kompienga, Ziro, Samarogouan, Pain-Dioulasso, Dano, etc.) and two former ESOP (Léo and Pô) are in charge of soybean production. BKB Burkina has obtained Ecocert certificate (organic farming certificate) in 2012 receiving financial support from BKB France. The inspection of agrochemical residues is conducted in Germany by private inspection company SGS. BKB Burkina provides technical guidance to the producers with the financial support of BKB France. The average cultivating area of contract farmers (3,500 in total) is 0.5ha, seed variety for cultivation is G197 and yield is 300kg/ha. The purchasing price in 2013 was at 215 FCFA/kg, of which the producers receive 200 FCFA/kg and the producer organizations (including former ESOP) receive 15 FCFA/kg. The purchasing price is generally 30 FCFA/kg higher than that of ordinary soybeans. The advance payment of 50% is made and the rest (50%) is paid after SGS inspection.

(4) Distributors

As soybeans are the new crop and its distribution volume is not large, besides contract farming, ordinary soybeans are collected and sold by the traders who usually handle grains. The distributors are divided into urban wholesalers/exporters, retail sellers in grain markets and collectors and small-scale collectors in the production areas.

²⁰ Léo former ESOP designates three (3) collection points for contract farmers and will pay 5 FCFA/kg for transportation fee from farms to collection points if the farmers transport them by themselves.

²¹ According to interview with BKB Burkina

The wholesalers/exporters, as described before, export the soybeans which are accumulated by the ordered local collectors to the grain wholesalers in the sub-regional countries who are used to trade. The retail sellers in grain markets are divided into retail markets in the production area and retail market in the other areas. The retail sellers are usually women. The production farmers and small scale collectors sell soybeans to the retail sellers in the retail market in the production areas but the collectors and urban wholesalers/exporters sell soybeans to the retail sellers in the retail market in the other areas.

The collectors in the production areas procure directly from the production farmers (groups) or collect necessary soybeans by ordering to small scale collectors. The collectors in the production areas procure usually on the receipt from orders from customers (exporters, feed processors), not by own decisions. Like this way, soybeans are traded by requests from demand side.

On the collection of soybeans, reliable small scale collectors are preferred and small scale collectors buy reliable production farmers (sellers) when they go around villages and retail markets for procurements. This is because preventing shortage of soybeans in plastic bags (100 kg) and mixture of small stones, sands and impurities in the bags.

The local collectors use transport vehicles (rental of trucks) to collect and store in small own warehouses. Then, they transport to the customers (Ouagadougou) by use of trucks which the customers chartered. When local collectors buy soybeans, they should pay in cash at that point. The some customers may pay part of procurement cost in advance but usually they refund later after selling to the next customers. So, there is problem of working capital in pay settlement for the local collectors.






With respect to trade price for soybeans, price is set first through negotiation between customers and local collectors. The decided price is as a standard price, and each buying price is decided through negotiation among small collectors, local retail sellers and production farmers (groups). The buyers' willingness to buy is reflected in price formation. For example, according to interview with production farmers and collectors in Centre-Est region (December 2014), collectors buy at about 220 FCFA/kg from the production farmers (groups) and sell at 260-265 FCFA/kg to feed processors in Ouagadougou.

(5) Soybean Processors

Here, leading soybean processed goods in Burkina Faso are introduced and the value adding activities are described. Then, flow-diagrams and profits (processing cost) is explained, taking up roasted soybeans for feed processing, soybean oil (soy cake) for industrial products and soy brochette for food processing.

1) Soybean Processed Goods

The main soybeans processed products for processing and marketing in the country are listed below.

Product	Soumbala	Tofu	Soy Brochette	Soy Milk	Soy Oil
					
Processor	Wend Malgda	Soja Santé	DJIGUI ESPOIR	Soja Santé	SIATOL






Product	Yoghurt (drinking)	Infant Nutrition Food (Misola)	Roasted soybean (poultry food)	Soy Juice	Soy Cake (animal feed)
					
Processor	Association les Amis de la Nature	former ESOP Léo	former ESOP Léo	Association les Amis de la Nature	Faso Grain

Fig. 9.1.10 Soybean Processed Goods Produced and Sold in Burkina Faso

Besides the products above, there are fried tofu (Soja Santé), Tokan (hard tofu: DJIGUI ESPOIR), soy breads and soy biscuits for other processed products. Also, there are Okara (soy pulp) and soy porridge for animal and poultry feed.

2) Value Adding Activities for Processing Goods

i) Food Processing

Soja Santé, modern Tofu related food processing industry in Ouagadougou, sells them to individual consumers and supplies to hotels, restaurants and supermarkets in Ouagadougou. The price of tofu (piece of 250 g) is at 600FCFA and soy milk (500g) at 300 FCFA in 2013. The cottage industries and women's groups which are the majority in food processing industries sell soy brochette (major food processing) at 50 FCFA per one. Also, the wholesale price of Misola by former ESOP Léo was 350 FCFA/pack (500g) in 2012.

ii) Roasted Soybean

The former ESOP in Léo, roasted soybean industry, sold at the price of 13,750 FCFA/50kg in 2012. Also, the price of roasted soybeans in Maison De l'Aviculture (MDA) was at 15,500 FCFA/50kg in August 2013.

iii) Industrial Processing

The SIATOL, soybean oil extracting company in Ouagadougou, sold 5L oil (plastic container) to middle men at 4,500 FCFA and soy cake to animal breeders at 280-325 FCFA/kg. The former ESOP group supply ordinary soybeans at 225 FCFA/kg (2012).

iv) Formula Feed

The products and prices of Faso Grain (created in 2011), one of large scale formula feed processors in the country, are 12,500 FCFA/50kg for layers and chicks, and 13,000 FCFA/50kg for broilers (6 October 2013).

3) Profits for Soybean Processed Goods

i) Roasted Soybeans

The flow-diagram for processing of roasted soybeans and profits are shown below.

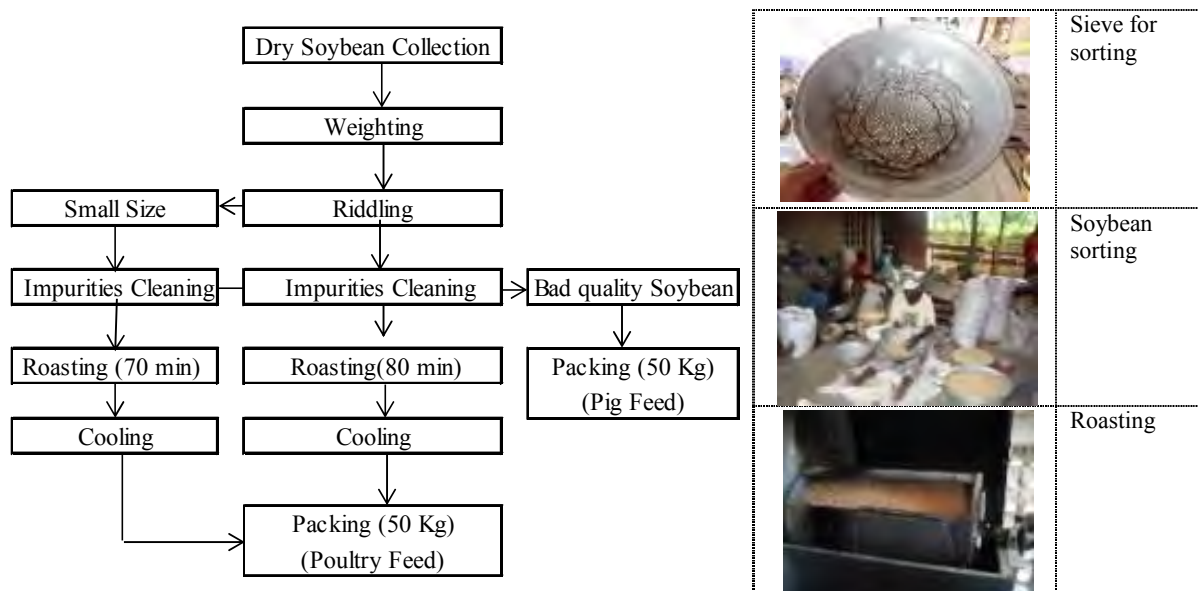


Fig. 9.1.11 Flow-diagram for Processing of Roasted Soybeans

Table 9.1.18 Profit for Roasted Soybean (2012)

Income	Expenditure*
50 kg (bag): 13,750 FCFA	50 kg (bag): 1,500-2,250 FCFA
Income for bag of 50 kg: 11,250-12,000 FCFA	

Source: Interviewed with former ESOP in Léo

*Raw material, Fuel and Lighting Costs (gas and electricity), labor Costs (soybean cleaning workers, machine operator) and Fixed Costs (depreciation, communication, plastic bags, etc.)

ii) Soy Oil (soy cake)

The flow-diagram for processing of soy oil (soy cake) and processing costs are shown below.

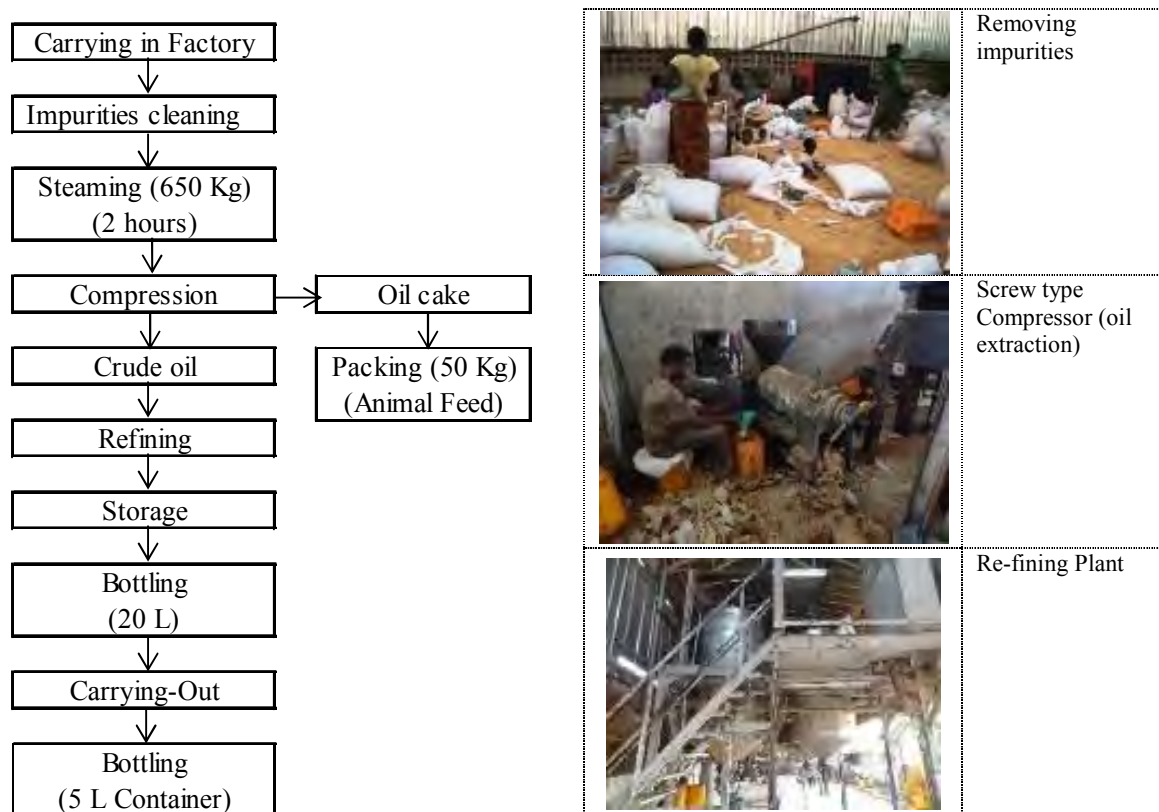


Fig. 9.1.12 Flow-diagram for Processing of Soy Oil (Soy Cake)

15 kg of oil and 80kg of soy cake are processed by 100 kg of soybeans. The rest of 5 kg are impurities (1%-2%) and water (3%-4%) lost in roasting stage. The depreciation cost (10 years) of oil extraction equipment is calculated at cost of 1 FCFA per 1kg of soybeans.

Table 9.1.19 Processing Costs for Soybean Oil (2012)
(15 liters of oil are extracted from 100 kg of Soybeans)

Items	Costs
Labor costs (women: removing impurities)	7,500-8,500 FCFA
labor costs (men: machine operators)	
Fuel and lighting costs	
Packing	
Re-finishing (payment to GENOL)	75 FCFA/L x 15 L (kg) =6,000 FCFA
Depreciation costs	1 FCFA/L(kg) x 15 L (kg) =15 FCFA
Total of processing costs	8,640-9,640 FCFA (15 liters of oil)

Source: Interviewed with SIATOL

The processing costs above exclude costs of raw material (soybeans) and fixed costs (communication and management staff salaries). Soybean oil is sold by 5L plastic container to middle men at 4,500 FCFA and soy cake to animal breeders at 325 FCFA/kg (2013). Therefore, for every 100kg of soybeans, 13,500 FCFA by selling 15L of oil and 26,000 FCFA by selling soy cake (80kg), sales total of 39,500 FCFA is expected.

iii) Soy Brochette

The flow-diagram for processing of soy brochette and profit by women group and cottage industries are shown below.

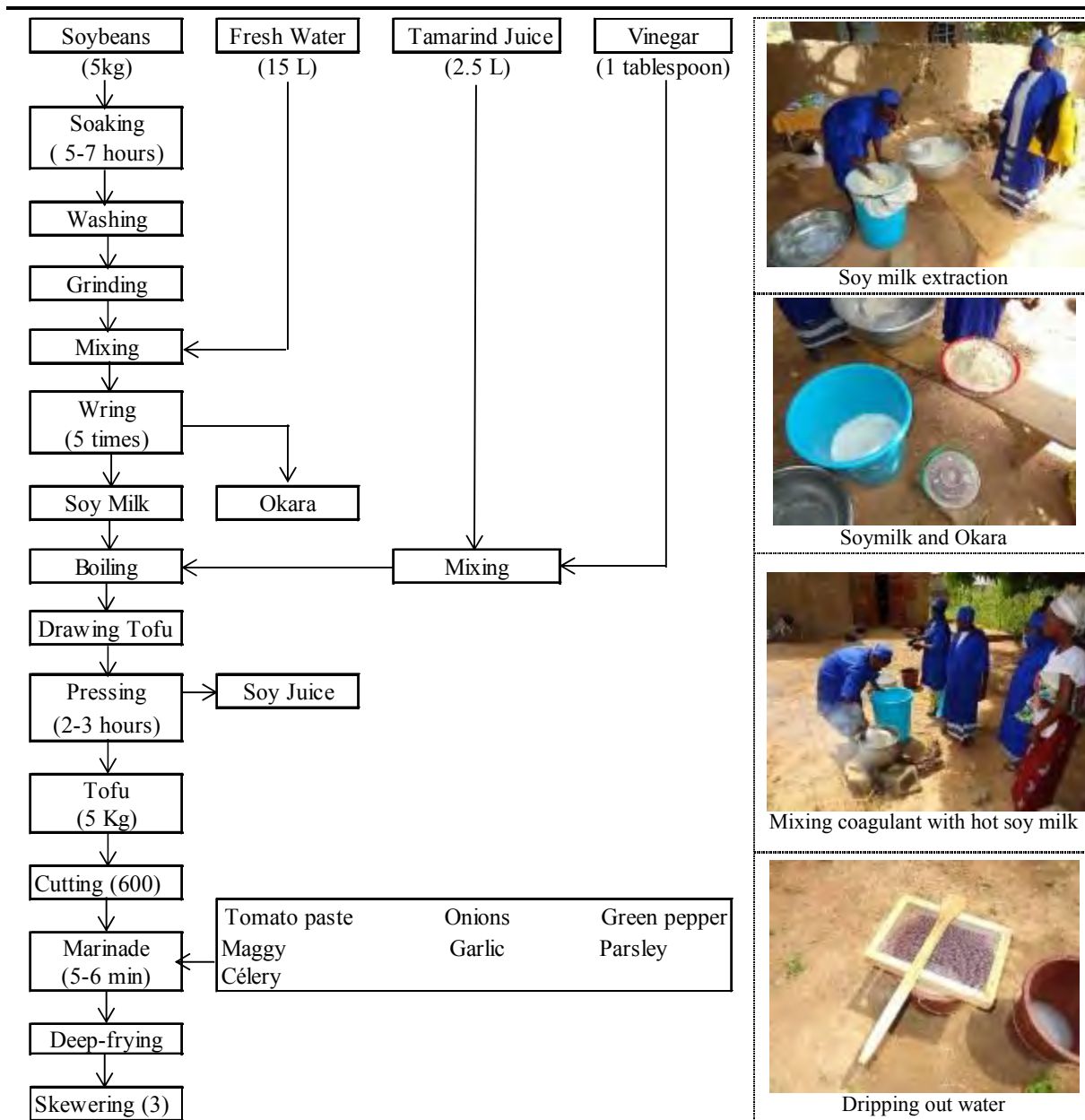


Fig. 9.1.13 Flow-diagram for Processing of Soy Brochette

Table 9.1.20 Profit for Soy Brochette (2012)

Income	Expenditure
Sales Price: 5,000 FCFA/5kg * 5kg of tofu are processed by 5kg of soybean on average.	<ul style="list-style-type: none"> • 5kg of Soybeans: 1,500 FCFA • Crushing Fee: 500 FCFA • Fuel wood: 400 FCFA (including brochette) • Tamarind: 300 FCFA • Labor cost²²: @162 FCFA x 3 hours x2 personal= 972 FCFA Total: 1,728 FCFA (5kg of tofu)
Income for 5kg of tofu: 2,300 FCFA	



Income	Expenditure
Sales Price: 10,000 FCFA *5kg of tofu are processed *200 brochettes are processed (each brochette has three small tofu) * Price of one skewer brochette: 50 FCFA	<ul style="list-style-type: none"> • 1 liter of oil: 1,000 FCFA • Tomato purée: 550 FCFA • Onion and Piment: 400 FCFA • Skewer: 400 FCFA • Bouillon: 250 FCFA • Garlic: 200 FCFA • Parsley and celery: 100 FCFA • Labor cost: @162 FCFA x 2 hours x2 personal= 648 FCFA Total cost: 3,548 FCFA (200 skewer brochettes) *Cost for one brochette: 17.74 FCFA
Income for one brochette: 32.26 FCFA (Excluded costs of labor, fuel costs, etc.)	

Source: Interviewed with Former ESOP in Léo

9.1.4 Formulation of Business Organization

There is no inter-professional organization established for soybean filière due to absence of national level organizations of farmers, traders/exporters and processors.

However, it is noticed the awakening of organizing soybean filière. DGPER organized a meeting in April 2011 by inviting the concerned actors for promotion of soybean filière based on the results of report “Study on Soybean Filière (2009)” prepared by HELVETAS and APME2A. In response to the recommendations of the meeting, core group was created with 24 representative organizations in soybean filière in May 2011. The members of core group are consisted of farmers, food processors, feed processors, exporters and agriculture equipment manufacturers. The objective of the group is to promote soybean filière and to establish inter-professional organization for soybean filière in the future. However, substantial activities have not been conducted by the group.

9.1.5 Support Projects by Other Donors

The major support activities to soybean filière are conducted only by international NGOs. Now, there are no major donors that provide supports for soybean as target agriculture crop at this point.

(1) World Bank - West Africa Agricultural Productivity Program (WAAPP)

WAAPP of World Bank has been implemented in Burkina Faso, Cote d'Ivoire and Nigeria as phase 1 from 2011 to 2016 for the purpose of food security and measure to poverty as well as tremendous increase of s agriculture GDP in order to achieve MDGs till 2015. The allocation of total budget for Burkina Faso in WAAPP is 23.99 million USD (contribution: Burkina Faso government=2 million USD, beneficiaries=0.99 million USD).

WAAPP has implemented the program by dividing it into 4 components, and for soybeans it is included in sub-component 3-3 “Facilitating access to improved genetic materials (seed, planting

²² The President decree (No. 2006-655/PRES/PM/MITSS/MFB) determines agriculture labor cost at about 1,299 FCFA per day and at about 162 FCFA per hour. Here, they are applied.

materials, animal breeding stock)” of the third component “Financing in response to Development and Technologies Adoption”. Under the sub-component 3-3, in order to increase animal live weight, activity is planned to increase seed multiplication including soybeans for production of animal fodder and feed and for this activity 4.46 million USD (Burkina Faso: 1.74 million USD, World Bank: 2.72 million USD) is earmarked. For this purpose, Ministry of Animal Resources has prepared in collaboration with MARHASA for the draft program of distribution of certified seeds for feed crops (including soybeans) in 2013.

(2) USA Soybean Association

World Initiative for Soybean in Human Health (program of USA soybean association) organized workshops with stakeholder such as concerned Ministries, organizations, and personnel for soybean nutrition in July 2012 and for poultry development in November 2013 in Ouagadougou. US Africa Development Foundation (USADF) provides financial supports for projects (including soybeans) targeting agricultural production and value-adding processing for the improvement of income in the marginal communities. USADF has supported DJIGUI ESPOIR (association)²³ with 116,544 USD (association processing soybean processed products) for repairing of equipment, increase of the production and preparation of business plans from 2013 to 2016.

(3) BKB France

Breizh Kongred Burkina (BKB) is an association in Bretagne province, France. In collaboration with BKB Burkina, it has been implementing the following activities.

- a) To obtain Ecocert certificate for APSERN (Association des producteurs de la Sissilli pour l'eco gestion des ressources naturelles), member organization of BKB Burkina.
- b) To import organic soybeans to Bretagne province (cooperation with BKB Burkina)
- c) To employ supervisors for organic farming and support technical guidance to the famers in the fields.
- d) To implement testing of compost making and application of organic fertilizers by using residues of vegetables and cereals
- e) To implement testing of rhizobium inoculation in collaboration with INERA.

(4) HELVETAS

HELVETAS selected soybeans as rotation crop for cultivation of organic cotton and implemented seed multiplication tests with former ESOP 3 years before, which brought 2 tons of seeds. As mentioned earlier, HELVETAS planned to produce organic soybeans (rotation crop for organic cotton cultivation) in collaboration with former ESOPs in Dédougou and Tenkodogo as pilot activity in 2013 and to export them to France through Gebana Afrique. The collection has started but the export volume (tons) is unknown.

(5) Lvia (Association de Solidarité et de Coopération Internationale)

Lvia has 2 kinds of projects; on-going project (started in January 2013 with 2 year duration,) and pipeline project (waiting for approval from Ministry of Foreign Affairs). The target area of two projects is Oubritenga province, Plateau Central region and the implementation partner is ASK (cowpea producers association). The projects are to provide raw materials (organic soybeans etc.) to group “Guipomgou” (supported by Italian NGO “Medicus Mundi Italia”) which has processed “Misola” in Ziniaré.

²³ The association supports disable women. 7 out of 33 members work in the association and received their salaries. The association processes soybean processed food and other grains processed food (flour and couscous). The association started its operation of processing soybean processed food by receiving equipment granted from Taiwan government.

On-going project	Pipeline Project
① Inputs Supply <ul style="list-style-type: none"> • Distribution of certified seeds (procured in INERA, variety: G-197) • Materials for making organic compost • Natural phosphate fertilizer • Agricultural equipment (hoe, shovel etc.) • Seeds of grass for prevention from soil erosion (andrepopon) 	① Training for seed multiplication farmers (distribution to the farmers) ② Opening of sales shop for agriculture inputs ③ Creation of compost making unit ④ Introduction of Warrantage system
② Conducting the training on cultivation techniques	
③ Sensitization to the local people (soybean nutrition)	

(6) L'Orange Bleue Afrique

L'Orange Bleue Afrique (French NGO) created a private company “Soja Santé” for the project in Burkina Faso. L'Orange Bleue Afrique has received financial supports from French private company “Nutrition et Santé” (which is now subsidiary of Otsuka Pharmaceutical). Soja Santé was granted equipment and materials such as tofu processing, grinding, separating, packing, etc., and received training on Tofu processing from French technicians. Soja Santé has started processing and marketing soybean processed food (tofu etc.) since July 2008. Soja Santé still receives financial support for the staff salary. It created a producers union of 400 farmers in 9 villages in Kossi province, Boucle du Mouhoun region. Then, the union cultivates soybean as rotation crop for fonio and produces annual production of soybeans of 15- 20 tons. Soja Santé exports fonio processed products (couscous) to France and sells them in the domestic market as well. However, L'Orange Bleue Afrique (French NGO) has not provided supports to Soja Santé due to the financial difficulty. Soja Santé is currently not being open for business.

(7) Others

There are NGOs conducting activities related to soybean processed food as one of supports for women processing groups. For example, Goupement Wend Malgda du Secteur N°2 de Tenkodogo (created in 1997 with 20 members)²⁴ processes cowpea, Soumbala, and soybean processed products (soy milk, soy brochette). The group was created by support of Belgian NGO “Vécoa” and has received technical and financial supports. The RTCF (Reseau de Transformatrices des Céréales de Faso) in Ouagadougou, which is composed of women cottage industries, has received technical and financial supports from French NGO “Afrique Verte”. Only two (2) companies of 20 members of RTCF processes soybean processed products. Furthermore, there are some volunteers of US Peace Corp who support women groups in their places of appointments in teaching soybean processed food (soy brochette, etc.).

9.1.6 Situation of Activities of Government Institutions

(1) MARHASA

MARHASA has pointed out soybeans together with corns and sorghum of food crop as food security since 2008, and has distributed seeds and fertilizers free of charge by use of financial support from FAO. The financial support of FAO has been finished in 2014. With respect to soybean seeds, about 3 tons (amount is different from size of province) were distributed through DPARHASA to communes in 2014²⁵. Actually, soybean production has rapidly been increased in production area in the country since 2008.

In addition, DGPER has provided supports for organizing soybean production farmers and for organizing women food processing groups as well as technical support for food processing.

²⁴ Wend Malgda is a member of UPPAB (Union Provinciale des Professionnels Agricoles du Boulgou).

²⁵ Interviewed at DPARHASA (Tenkodogo, Ouargaya) in Centre-Est region (21 of December, 2014)

(2) SOCOMA (la Societe Cotonniere du Gourma): Cotton Companies

SOCOMA has distributed 5kg-10kg of soybean seeds (G196) per one farm household free of charge during the period of April, May and Jun for the wishing cotton production farmers as rotation crop of cotton in the responsible area of eastern part of Burkina Faso (Est region and Centre-Est region) since 2012 (2013 record: 100 tons)²⁶. It aims to improve fertilization of soil by cultivation soybeans as rotation crop for cotton.

9.2 Promotion Issues and Promotion Measures

9.2.1 Promotion Issues

Recently, the production of soybeans in Burkina Faso has been rapidly increased in response to growing demand of soybeans for high quality and inexpensive ingredient of animal feed in the domestic market and markets in the sub-regional countries and Western Europe as well as increasing consumption of soybean processed food for high nutrition and healthy food in the domestic market. Soybeans have more advantages for the small-scale farmers as soybeans are relatively easily cultivated, high redeemable crop, possible to store longer period, and contribute to fertilization of soil (prevention of deterioration of soil). Further, soybeans are placed an important crop since it is one of agriculture crops for national food security designated by MARHASA. On the other hand, soybeans have strong linkages with related industries such as feed processing (formula feed, roasted soybeans), industrial processing (oil, soy-cake) and food processing (Soumbala, soy milk, Tofu related food, infant nutrition food) in the country, comparing with other crops, and also have high induction effects for those industries. Indeed, receiving growing demand of feed and processed food, recently those industries have been established. Particularly food processing industries contribute for rural women to precious cash income sources.

From viewpoint of promotion of in-country related industries by soybeans production, for specification of promotion issues and formulation promotion measures, except for export chain (organic soybeans, ordinary soybean), two value chains in the domestic market, namely value chain of processed feed and value chain of food processing, are specially focused. The former contributes promotion of livestock industries, supply of inexpensive chicken meet and eggs, through provision of feed materials, and the latter contributes to variety of processed food such as food from traditional Soumbala to oil, confectionery and infant nutrition food, and specially is expected to contribute effects of job creation for rural women.

The promotion issues for two value chains above are as following.

(1) Shortage of Distribution Volume in Domestic Market

The demand of soybeans for animal feed replacing expensive fish meals has been significantly increased in Burkina Faso. However, distribution volume of soybeans in the domestic market is obviously insufficient. This is a problem in feed value chain. Also, there are other issues such as irregularity of quality and mixture of impurities which currently reaches 6-10% for soybeans produced in Burkina Faso distributing in the domestic market. In order to increase of soybean distribution volume in the domestic market, soybean production volume in the country needs to be increased.

The production farmers have the limitation to expand cultivation area because of lack of agricultural materials, completion of land use with food crops and cash crops and problems of distribution labor input. Further, the smooth distribution is disturbed due to the fact that soybeans are new crops and therefore the dealing volume are small and the production farmers and collectors have high market risk and sales risks. To this end, it is necessary to solve problems from two sides, production and distribution, in order to increase of soybean distribution volume in the domestic market.

²⁶ 30-35kg/ha of seeds are necessary.

First of all, there is a way to expand the production volume by distributing soybean seeds free of charge (adopting soybeans in crop rotation with cotton) like MARHASA and SOCOMA are currently doing in response to rapidly growing soybean demand. Also, it is important to foster seed multiplication farmers by training the wishing farmers. Next, in order to production increase for good quality soybeans considering constrains of the production farmers, it is indispensable to assist and disseminate technologies for increase of yield per ha (productivity) and improvement of quality. As technology for productivity improvement, it should be examined for increase of yield per ha to apply low input of chemical fertilizers and introduction of high yield varieties which have not been tried in soybean cultivation of Burkina Faso. With respect to careful selection of impurities, it is necessary to introduce urgently treatment technologies and mechanism for impurity management at post-harvest and collection stages, together with sensitization to the production farmers.

On the other hand, in order to supply produced soybeans smoothly in the domestic market, securing buyers and obtaining price information in advance are indispensable for production farmers. And also, it necessary to reduce transaction cost in collection and distribution for the collectors. For this purpose, there are several measures like joint-shipment and -collection by the producers organizations, information exchange between the production farmers and collectors, establishment of accumulation points and buying period, construction of storehouses and contract/entrusted agreements with feed processing industries (formula feed, roasted soybeans) and collectors. However, it is an issue for collectors and buyers of contract cultivation not to prepare enough cash to buy soybeans from production farmers and local markets. Therefore, “warrantage system” is used that is applied to niebé.

(2) Under-development for Small Scale Business for Soybean-processed Food

The women processing groups and cottage industries processing soybean-processed food have been increased in number in proportion to permeation of advantages of soybeans for high nutrition and healthy food by the efforts of NGOs and Burkina Government. The experience of other West African countries shows evidence that soybean-based food processed and sold by small scale food processing industries are more disseminated than soybean-based food in local home cooking which is developed to use more soybeans. This is resulted in the fact that more soybeans are consumed. Also, local small scale food processing industries contribute more significant impact for rural economy through use of local resources (crops, manpower and money) and creation of cash income and employment.

However, beside soybean Soumbala, consumption of soybean-based food is limited in the domestic market due to lack of food processing knowledge and experience because of the new field and still lower degree of recognition. Under this situation, in order to further promote small scale business for soybean-processed food, it is necessary to try operational improvement and increase of profit by providing support for reduction of labor input, increase of rate of return, improvement of hygiene condition, assurance of sales points and at the same time expansion of variety and sales volume of processed food through improvement of food processing knowledge and techniques, together with sensitization to the general consumers for merits of soybean-based food.

(3) Insufficiency of Collaboration for Soybean Filière Professional Organization

The soybean core group was created in May 2012 by 24 but organizing soybean filière has not been progressed well up to now. As the stakeholders in each sub-sector (farmers, processors, distributors and exporters) in soybean filière are not organized, it becomes difficult to deal with common issues of subsectors as a whole. For instance, due to absence of farmer organizations, it is unable to cope with problems in strengthening of bargaining power, improvement of negotiation power, efficient acquisition of techniques and information, realization of economies of scale and improvement of access to agricultural credit etc. Moreover, collaboration actions have not been taken for reduction of custom duties on feed materials and checks which are issues in the poultry farming and for soybean quality standards and feed composition standards.

Moreover, network is weak between subsectors, downstream side (consumption/demand side) of feed

processing industries, food processing industries and livestock industries (including poultry) and the upstream side of production farmers and collectors. To this end, it is difficult to create collaboration system in response to current rapid increase of soybean demand in the country. It is therefore necessary to strengthen network, particularly for highly demanded network, production farmers-distributors-feed industries-livestock industries (poultry), by forming system to smoothly share information among stakeholders in soybean filière.

For that purpose, it is necessary to create inter-professional organization for soybean filière at national level through support to soybean core group in conformity to “law on filière inter-professional organization for agriculture, forestry, fisheries and livestock (loi 050-2012/AN)” enacted in 2012.

(4) Necessity for Extension and Development of Soybeans Varieties by Usage

INERA has recently conducted trial cultivation for introduction of varieties for bigger seeds and higher yield. Currently, only 4 varieties are cultivated in Burkina Faso and most farmers and processors use the same variety (GI197). Also, the supply volume of certified seeds is extremely low. However, the needs for seed varieties are different according to the uses (farmers, processor for animal feed, processor for food processing and processor for industrial products) and also suitable seed varieties are different according to soil and climate conditions. For example, according to interview with production farmers, there are large demand from the production farmers for drought tolerance variety and variety of early ripening. For the production farmers, it is indispensable for improvement of incomes to increase productivity (yield per ha) of variety which is higher market needs, and use of good seeds lead not only to improvement of productivity but also to reduction of labor input because of shorter cultivation period and reduction of agriculture chemicals and materials cost because of avoidance of competition with weed growing and tolerance of disease and insects.

Therefore, in order to support increase of soybean production and consumption in medium and long term, it is necessary to select soybean varieties through DGPV and stakeholder participation in accordance with various needs of farmers and processors in Burkina Faso. And the new soybean varieties are disseminated by training seed multiplication farmers.

9.2.2 Promotion Measures

In the promotion issues above, considering viewpoint for strengthening efforts of the government of Burkina Faso the measures to be urgently responded and to be rapidly taken up for the future development, the under-mentioned promotion measures will be selected.

(1) Increase of Soybean Distribution Volume in the Domestic Market

For the increase of distribution volume of the domestic market, it is necessary to increase supply volume in the domestic market. To this end, it is required to solve problems from both side of production and distribution.

First of all, in order to increase of soybean distribution volume of the domestic market, there are measures that are improvement of productivity, increase of production volume and improvement of distribution system. Here, the measure combined improvement of productivity with increase of production volume is selected for the promotion plan. For the measure to increase of soybean production volume, support is provided MARHASA for the efforts of distribution of soybean seeds free of charge to each commune. And also, efforts of SOCOM which distribute soybean seeds free of charge to cotton growing farmers in the eastern regions as rotation crop are applied for SFITEX and Faso Coton. In the implementation, the productivity can be increased by providing technical instruction and high yield varieties.

Next, in order to distribute soybeans smoothly in the domestic market, among measures for reduction of sales risk for production farmers and of transaction cost for collector, information sharing and

establishment of accumulation point and collection period between collectors and production farmers are selected as a measure to be tackled urgently. So soybean supply volume in the domestic market increases by implementing improvement of productivity and increase of production volume through distribution of high yield variety seeds with improvement of distribution system, which is information dissemination and sharing among production farmers, collectors and actual users.

(2) Promotion of Small Scale Business for Soybean-processed Food

With respect to promotion of small scale business for soybean-processed food, it should be supported as promotion issue to be rapidly taken up for the future development of food processing industries due to the fact that it is the new field and insufficient support from the government of Burkina Faso and donors. As mentioned earlier, soybean processing industries are considered local consumption of locally produced type of industries so that great impact to rural economy is expected as they contribute significantly to cash income and creation of employment for rural women. However, it is difficult to say that merits of soybean are not well utilized due to the fact that cottage industries and women processing groups are lack of knowledge and skills on food processing and are limited to produce variety of processed food. Thus, targeting Tofu related processing food which are major food item for small scale business for soybean-processed food, it is necessary to expand small scale business for Tofu related food by improving knowledge and skills on Tofu related food as well as sensitization of merit of soybean processed food for creation of better business environment.

(3) Establishment of Inter-professional Organization for Soybean Filière

With respect to establishment of inter-professional organization for soybean filière, the soybean core group (group noyau) has been created already by 24 organization representatives from soybean filière supported by DGPER. However, function and collaboration of stakeholders in the filière are weak and therefore there is no collaboration system to jointly tackle common issue in each sub-sector and between subsectors. This promotion issue is considered issue to be urgently tackled since it supports both sides of organization and system for developing two value chains of processing materials of feed and processing materials of food for soybeans. Thus, it aims in the end at establishment of inter-professional organization by organizing stakeholders through support for capacity strengthening of the core group, facilitation of collaboration and cooperation among filière stakeholders and efforts to solve problems in each sub-sector and between subsectors.

Now then, with respect to extension and development of seed variety by usage, it will not be selected for promotion measures because it should be tackled from long term perspective.

9.3 Pilot Activity for Preparation of Extension Material for Improved Processing Techniques of Tofu Brochettes

9.3.1 Outline of Pilot Activity

(1) Background and Objective

Pilot Activity will select Tofu brochettes as target product, which is the major product of women groups and cottage industries occupying the majority in soybean-processing business. Then, it should be facilitated by improving processing techniques of Tofu brochettes not only to promote the reduction of labor inputs, increase of rate of return and reduction of processing costs but also to attempt diversification of products, increase of sales volume and profit through utilization of by-products (Okara) obtained in process of Tofu brochette processing. Also, it will provide the support for assurance of customers which is the one of largest problems in Tofu-related food processing business.

Based the implementation results of the above activities, the training will be provided to women groups and cottage industries, and the extension material for improved processing techniques of Tofu brochettes will be prepared for the final objective. On the other hand, the results of Pilot Activities will

be publicized and disseminated through participation in agriculture/trade fairs and utilization of mass media.

(2) Related Promotion Measures and Testing Hypothesis

“Promotion of small-scale soybean processed food business” is selected as promotion issues in soybean food processing value chain. Then, in order to facilitate “expansion of Tofu related food processing business”, “improvement of techniques and knowledge on Tofu related food processing” and “sensitization of soybean processed food” are selected as promotion measures. In Pilot Activities, “sensitization of soybean processed food” will be implemented in small scale by use of mass media and through conduct of training for small-scale food processing industries, and on the other hand as parts of activities for “improvement of techniques and knowledge on Tofu related food processing”, the under-mentioned five (5) hypotheses will be tested in relation with improved processing techniques of Tofu brochettes and the assurance of customers.

- a) Yield volume of Tofu and nutrition in soy milk will be increased by changing from prevailing raw wring techniques for processing soy milk by small scale food processing industries in Burkina Faso to internationally conducted heat-up wring techniques for processing soy milk.
- b) More volume of good-tasting Tofu will be produced by changing from prevailing coagulant of tamarind juice (acid) by small scale food processing industries in Burkina Faso to locally-available other coagulants (salt).
- c) Work efficiency will be improved by introducing locally-manufactured simple equipment for Tofu forming and soy milk wring which are presently made using the hands by small scale food processing industries in Burkina Faso.
- d) ”Okara” that are presently disposed or sold cheaply as feed will be able to be commercialized as local preference food.
- e) The stable buyers will be assured by customer diversification as Tofu brochettes are generally sold by order-based sales and itinerant trade.

In regard to soybean processed food, particularly for tofu making, the JICA team (Japanese people) is very familiar with Tofu and has much more experience and knowledge than Burkina Faso and other donors so that this promotion measure is implemented as the pilot activity. Particularly, improved processing techniques for soy milk is core technique for all Tofu related food processing techniques and therefore it is expected that this will greatly contribute to “expansion of Tofu related food processing business”.

(3) Approach of Pilot Activities in Vale Chain

Soybeans were introduced and extended in the 1980s in Burkina Faso as high nutrition agriculture crop. Since the 2000s, soybean production has been rapidly increased for materials of feed processing and after 2008 for agriculture crop for food security of Burkina Faso. Currently, the major sales market is for feed soybean market particularly for poultry farming but there is also soybean market for food processing. The soybeans are distributed to the market of domestic, neighboring countries and EU as materials for feed and food processing. With respect to the domestic market, the largest problem is the shortage of in-country soybeans distribution volume against its demand. On the other hand, there is the problem in lack processing and marketing capacity of food processing industries and in lower recognition rate of the general consumers on soybean processed food for value chain for processing food of soybeans.

The pilot activities will adopt approach for food processing industries and retail sellers in value chain for soybean processed food.

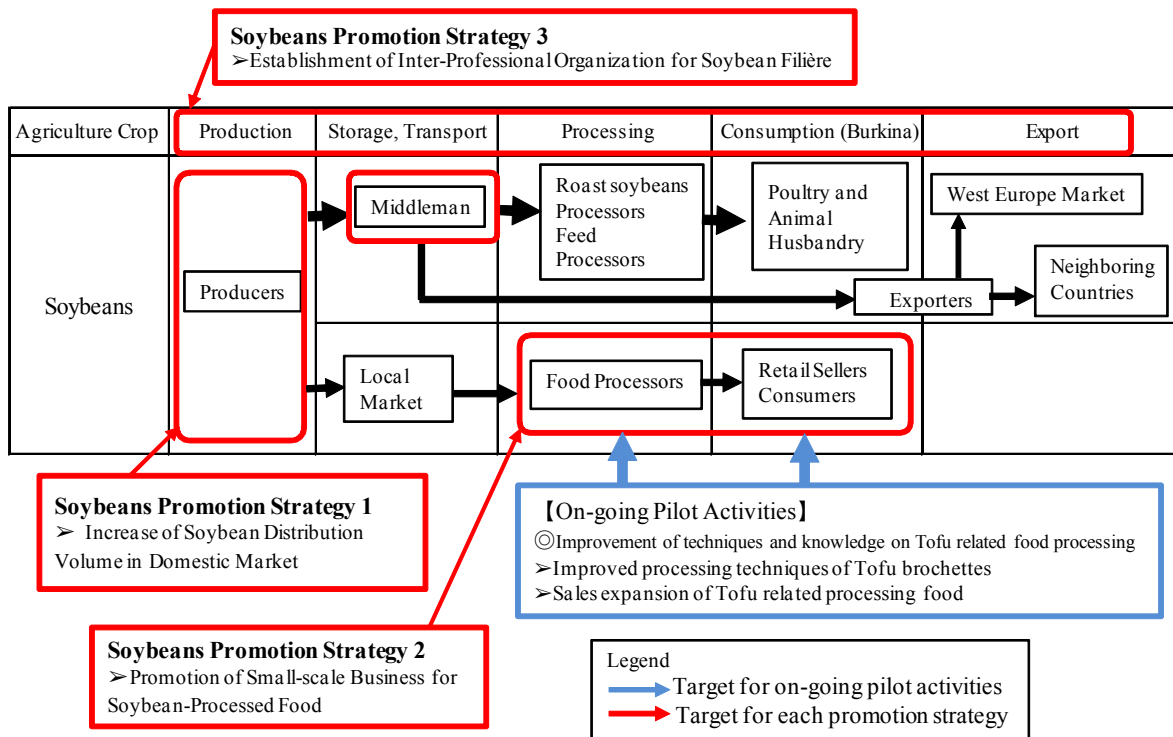


Fig. 9.3.1 Approach of Pilot Activities in Value Chain for Soybean

(4) Contents of the Pilot Activity

1) Target Area

The target areas are Léo in Sissili province, Centre-Ouest region.

Sissili province is ranked at fourth in top 10 provinces of the total national production during the period. Further, its production has been increased by more than 20 times from 21 tons in 2003 to 4,250 tons in 2012. Thus, Sissili province is the major production area closest to Ouagadougou, the largest consumption area in Burkina Faso.

2) Target Group

The target group is the Association les Amis de la Nature (ASAN: Women Group) in Léo in Sissili province.

Léo is famous of soybeans food processing and lots of soybean food processing groups are located there. ASAN is one of these women groups and has close relation with former ESOP which has tried advanced techniques such as soybean cultivation and processing. Therefore, ASAN will be a stronghold to disseminate new knowledge and techniques.

Outline of ASSOCIATION LES AMIS DE LA NATURE (ASAN)

<Name >: ASSOCIATION LES AMIS DE LA NATURE (ASAN)

<Date of Establishment>: 12th November, 2010 (Léo, Sissili Province)

<Objective of Establishment>: Its objective is to control poverty and drought through the protection of the environment and the valorization of dry season cultures. The association therefore sets the following objectives:

- Initiate a network of producers into market gardening and breeding;
- Develop nursery creation

- Contribute to forest management
- Promote activities and train underprivileged populations in the following areas:
 - Health: sexually transmitted disease (IST), HIV/AIDS and other diseases
 - Education and literacy
 - Hydraulic, agriculture, breeding and agro-forestry
- Participate in the town embellishment, forest redevelopment and restoration
- Contribute to the cleanness of towns through recycling waste
- Contribute to poverty control and participate in social and economic development
- Support the commercialization of agricultural products
- Contribute to young girl self-employment

<Organization Structure>: The association includes about 25 members. The association is managed by a board of 5 members and a control committee including 2 persons who are elected during the general assembly. The board members are consisted of President, Secretary, Treasurer, Management, and information.

<Financial Resources>: The association resources come from the members' contribution (3,000 FCFA/year), resources from their social and economic activities, subsidies, donation, legacies and support from international organizations.

<Collaboration>: The association can be twinned with another association of the same nature in Burkina, Africa and in the world, if this twinning does not undermined their interests.

3) Implementation Period

May 2014 to January 2015

4) Implementation Organizations

DGPER and JICA team

5) Content of Activities

In order to attain the purpose of pilot activities above, i) improvement of processing techniques for Tofu brochettes, ii) support for assurance of stable income source, iii) dissemination of effects of pilot activities, iv) preparation for extension material of improved Tofu processing techniques.

i) Improvement for Processing Techniques for Tofu Brochette

Tofu related food processing business will be attempted in efficiency of their operation by improving current Tofu processing techniques.

Table 9.3.1 Processing Techniques for Tofu Brochette

Operational Efficiency	Processing Techniques to be improved
Improved Yield Rate of Soy Milk	Change the current raw wring techniques (raw soy past) to heat-up wring techniques (boiled soy past) for processing soy milk
	Introduction of new coagulants beside tamarind juice (salt coagulants)
Improved Labor Productivity	Introduction of heat-up wring equipment to reduce labor input and to avoid dangerousness of heat treatment for boiled soy past.
	Introduction of Tofu forming equipment to reduce labor input and to avoid dangerousness for Tofu forming at a high temperature.
Improved Rate of Return	Try to diversify Tofu related food by utilizing by-product which are produced in Tofu processing process, and are presently disposed or sold cheaply as feed.
	Try to commercialize food utilizing Okara.

ii) Support for Assurance of Stable Income Source

Currently, the significant problem for many small scale industries of soybean food processing is assurance of stable income source. The pilot activities will support ASAN by providing the following activities.

Table 9.3.2 Contents of Support for Assurance of Stable Income Source

Stable Income Source	Contents of Support
Supply to Lycée Bérékia	To deliver Tofu related food to dormitory of Lycée Bérékia in Léo city.
Supply to centers of NGO "Compassion"	Based on discussion with the branch of NGO in Léo, Tofu brochettes will be delivered to the interested centers out of 5 centers in Léo city.
Establishment of food stand for Tofu related food	By establishing food stand (kiosk) of ASAN in Léo city, sales place will be secured and functioned as antenna shop for soybean related food.

Outline of Activities of NGO "Compassion"

- There are 5 centers in Léo city and 7 centers in Sissili province. All of them are located in Christian church.
- Program of NGO are 1) Children Development Support Program (target for poor family), 2) Children Survival Program (support for pregnant women and nursing others), 3) Leadership Development Program (support for top performers to attend university: grant for tuition fees), 4) Complementally Interventions Program (improvement for facilities in the centers)
- Under Children Development Support Program, lunch, tuition fees (primary school: 1,000 FCFA, junior secondary school: 1,500 FCFA), educational materials and etc. are provided. In addition, care for children abuse, medical fees and treatments, medicine for poor families are provided if they are necessary.

iii) Dissemination of Effects of Pilot Activities

The effects of the pilot activities will be disseminated through participation into agriculture fairs and by utilizing mass media such as newspaper, radio and TV.

iv) Preparation for Extension Material of Improved Tofu Processing Techniques

The extension material for improved Tofu processing techniques will be prepared as a final output of the pilot activities and will conduct training for cottage industries and women's processing groups.

9.3.2 Results and Implementation Situation of Pilot Activities

(1) Improvement for Tofu Brochettes Processing Techniques

1) Change of Raw Wring to Heat-up Wring to Produce Soy Milk

The both methods of raw wring and heat-up wring are shown in the table below. The difference of the both methods is the point on how to make soymilk whether by wring raw soy past or by wring boiled soy past. The raw wring method is widely used by small scale soybean food processing industries (women's group and cottage industries) in rural area and urban area in Burkina Faso. On the other hand, heat-up wring method is the method that is planned to be introduced by the pilot activities.²⁷

²⁷ According to the limited literature survey, raw wring method to produce soy milk is used not only in Burkina Faso but also in West Africa countries such as Nigeria, Tog, and Benin. On the other hand, heat-up method is used generally not only in Asian countries but also American and European countries which processes Tofu..

Raw Wring	Soybeans → Washing → Soaking → Grinding → Raw soy past → Wring → Soy milk and Okara
Heat-up Wring	Soybeans → Washing → Soaking → Grinding → Raw soy past → Heating → Wring → Soy milk and Okara



Fig. 9.3.2 Raw Wring Method and Heat-up Wring Method to Produce Soy Milk

For the benefits of heat-up wring method, it is expected improvement of extraction rate of nutrients into soy milk by heating soy paste with over 60 °C and deactivation of lipoxygenase (enzyme for green-smelling) and trypsin-inhibitor (more breakdown of protein).

This time, together with ASAN, 1kg of soybeans is soaked for 12 hours, and then is ground and added with 10 L of water. Soy milk is produced by both wring methods. The different two types of soy milk are analyzed by Institut de Recherche en Sciences Appliquées et Technologies (IRSAT). The analyzing results are the followings.

Table 9.3.3 Comparison of Nutrient Component between Raw Wring Method and Heat-up Wring Method

	Protein	Lipid	Carbohydrate	Total
Raw Wring Method	1.07%	0.42%	0.79%	2.28%
Heat-up Wring Method	1.23%	0.93%	0.84%	3.00%
Rate of Increase	115%	221%	106%	132%

Source: IRSAT (13 June, 2014)

Further, together with ASAN, Tofu is processed by different wring methods. The followings are experiment results on how much Tofu are produced using different wiring method.

Table 9.3.4 Comparison of Tofu Production Volume between Raw Wring Method and Heat-up Wring Method

Soybeans	Wring Method	Okara	Coagulant	Tofu
5 kg of soybeans were soaked for 10 hours. They were ground and added with 50 L of water.	Raw wring	11 kg	Tamarind Juice	About 7.5 kg
	Heat-up wring	11 kg		About 10.0 kg

Source: ASAN (8 July, 2014)

Based on the two experimental results above, it can be concluded that the heat-up wring method is higher productivity than raw wring method in term of extraction of nutrients and Tofu production volume. This result indicates that more yield and much nutrient of Tofu is produced in the same amount of soybeans by changing to heat-up wring method.

2) Introduction of New Coagulants

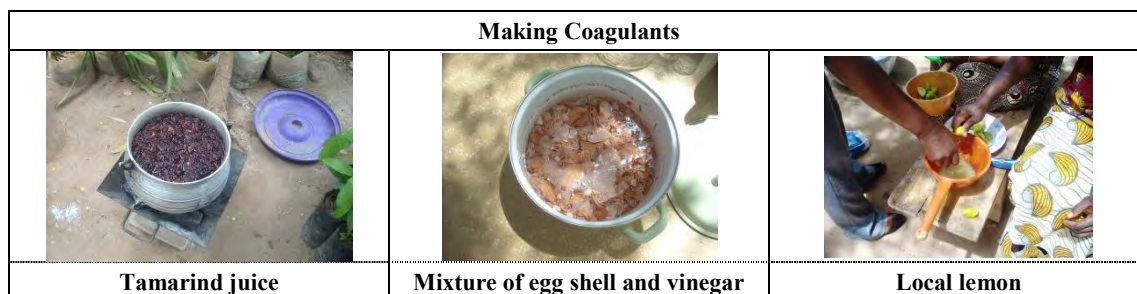
Tofu is a food made by coagulating heated soy milk. There are two methods of coagulation, salts and acids, in coagulating mechanism. As shown below, there are a number of coagulants under each coagulation method and each coagulant has different characters. The coagulant mixture in the same coagulation method is used commercially.

Table 9.3.5 Coagulation Methods and Coagulants for Tofu

Method	Mechanism	Coagulants
Salt Coagulation	Coagulation occurred along cross-linking between cation (positively charge ion) such as Mg^{2+} or Ca^{2+} with protein molecules in soymilk. Furthermore, it is caused decreasing of protein solubility to form curds.	Magnesium Chloride ($MgCl_2$)
		Calcium Sulfate ($CaSO_4$)
		Magnesium Sulfate ($MgSO_4$)
		Calcium Chloride ($CaCl_2$)
Acid Coagulation	It coagulates protein at isoelectric pH. In solution, acid donates proton (H^+ ion). At isoelectric point, reaction between positives charge of H^+ ion with negative charge of protein functional group will result a neutral charge. In that condition, protein solubility is decrease and gel is formed.	Glucono delta-lactone (GDL)
		Acetic acid (example: vinegar)
		Citric acid (example: tamarind juice, lemon juice)



The tamarind juice is widely used as coagulant by small scale soybean food processing industries (women's group and cottage industries) in rural area and urban area in Burkina Faso. However, the small industries which has received assistance from foreign donors (example: Soja Sante) are used to import Calcium Sulfate from France. The private company "Laboratoire Aina" in Ouagadougou has imported Calcium Sulfate from Germany and sells it but it is very expensive (55,000 FCFA/500g).

Thus, together with ASAN, several coagulants beside Tamarind juice, 1) Calcium Sulfate, 2) local lemon, 3) commercialized vinegar, 4) mixture of egg shell and vinegar (salt)²⁸, 5) Bisap juice, are used for experimental trials.



Tofu is processed using raw wring method and Tofu is evaluated by 4 items, "yield", "taste", "texture" and "compact". The evaluation results by ASAN members are the followings.

²⁸ When vinegar is applied to egg shell ($CaCO_3$), calcium acetate (salt) will be created in the following chemical reaction. $CaCO_3 + 2CH_3COOH \rightarrow Ca(CH_3COO)_2 + CO_2 + H_2O$

Coagulants	Calcium Sulfate (3.5g/1L of soy milk)	Local Lemon (2 lemon juice/1L of soy milk)
Yield	About 1,400g	About 1,380g
Taste	Taste of tofu	A little flavor of lemon
Texture	Smooth	Rough
Compact	Soft	Firm
Picture		
Comments	Women like more lemon coagulant Tofu (7 persons) than Calcium sulfate coagulant Tofu (4 persons). But after cooking to brochettes, women prefer brochettes made by Calcium sulfate coagulant Tofu.	




Coagulants	Vinegar (165ml/9L soy milk)	Mixture of egg shell and vinegar (600ml/9L)	Bisap Juice (Proper quantity)
Soy milk	9L	9L	14.5L
Yield	About 1,850g	About 1,900g	About 1,850g
Taste	No favor	Tofu taste	Little bit blackish
Texture	Smooth (small holes)	Smooth	Small holes
Compact	Hard	Soft	Very hard
Picture			
Comments	Most of women like Tofu using coagulants of mixture of egg shell and vinegar but do not like Tofu using coagulants of Bisap juice.		

Fig. 9.3.3 Evaluation of the New Coagulants by ASAN Mambers

The experimental results show that there is no significant difference in yield volume, tasting- sour for lemon coagulant, blackish for Bisap coagulant, much labor requirements for mixture of coagulant of mixture of egg shell and vinegar, most Tofu-like Tofu for coagulant of Calcium Sulfate. Considering price of coagulant, requirements of labor inputs to make coagulant, and condition of final product (brochettes), conventional tamarind juice is the most suitable coagulant for the small scale Tofu processing industries (women's groups and cottage industries)²⁹.

3) Introduction of Heat-up Wring Equipment and Tofu Forming Equipment

It is common practice to work using with hands to make Tofu (Tofu forming and wring for soy milk) for small scale Tofu processing industries (women's groups and cottage industries) in rural area and urban area as shown the pictures below.



²⁹ Coagulation of soymilk protein is the most important step in Tofu-making process. It depends on the complex interrelationship of variables, soybean variety and chemistry composition, soymilk cooking temperature, soymilk volume, solid content and pH, coagulant type and amount, coagulant concentration, method of adding and mixing coagulant into soymilk, and coagulation time.

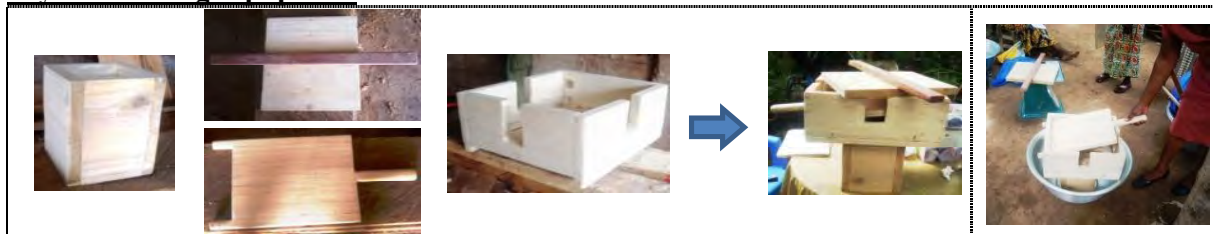
Thus, taking up changing heat-up wring method to raw wring method, equipment for Tofu forming and heat-up wring, which must be simple and cheap and can be manufactured everywhere, is to be developed from point of view of reduction of labor burden and times, further of prevention from burning. Moreover, it can reduce waste of Tofu in case of sale in brochettes shape due to quadrangular prism form of Tofu by using Tofu forming equipment.

First of all, considering situation of work using with hands, prototypes of equipment of Tofu forming and soy milk wring are made on an experimental basis. Then, based on comments of ASAN members and actual usefulness of equipment, they are finalized by putting improvements. Both of equipment is manufactured by a carpenter in Léo city taking into consideration their dissemination and sustainability.

Tofu Forming Equipment



Soy Milk Wring Equipment



4) Utilization of By-product (Okara) in Tofu Processing Process

Okara (soy pulp) is residuals of soy milk which are extracted from soy paste, and presently disposed or sold cheaply as feed³⁰ even though it is very high nutrition value. Thus, Okara are targeted and Okara-based food, sun-drying (heat-up wring), dry powder (cooking ingredient), deep-fry and cookie, are experimentally cooked for the means of improvement of value added.



As Okara is not consumed as food material in Burkina Faso, there is no Okara-based food. Therefore, study on Okara-based food is conducted by using internet. Then Okara food, which is good-taste for the common Bukina people, is experimentally prepared by using local available food materials with simple cooking utensil in a plain cooking method. At present, Okara cookie (3 pieces at 50 FCFA) are sold at food stand (kiosk: antenna shop) as described later.

³⁰ The trypsin (prevention from digestion) in soybeans should be removed by heating up in order to make soybeans animal feed. In a word, Okara produced by raw wring method is necessary to be heated up for feed.

(2) Support for Assurance of Stable Income Source

1) Supply to Lycée Bérékia

During implementation period of the pilot activities, as the final approval has not been granted by Lycée Bérékia in Léo city, soybeans processing food has not been delivered by ASAN.



Lycée Bérékia

2) Supply to Centers of NGO “Compassion”

Tofu brochettes have started to deliver once per week (Thursday) to the under-mentioned center of NGO “Compassion” in Léo city at July 10, 2014.

< Delivery > : Children Development Center (CDE. BF 503)
 < Owner of Center > : Temple EL-Shaddai (Christian Church)
 < Outline of Activities > : This NGO looks after 252 children with 3-5 years who live within 3km radius every Thursday from 07:00 to 15:00³¹. Then, NGO teaches children (religion, physical education, sentiment, social education) and provides snacks and lunch. The most of staff are basically volunteers from common peoples.
 < Delivered Food > : Snack at 10:00 AM (Tofu brochettes)
 < Reason of Selection > : High nutrient value. Children like Tofu brochette. Sandwich, biscuits and candies were provided before.
 < Number > : 300 brochettes (50 FCFA per one)



Tofu brochettes

Exterior of Center

Distribution

One for child

So far, 200-650 of Tofu brochettes and soy milk yoghurt at a one-time has been delivered irregularly to 3 centers out of 5 centers located in Léo city. It is necessary individual network in receiving sales amount and new orders from the centers of NGO “Compassion”. The problem is that business is obstructed since member of ASAN are not acquainted with the contact staff. The human relationship becomes very important in cultivating new clientele.

The goods are sold at working place by ASAN. The profits in the working place during 9 October – 27 December, 2014, are shown in the table below. This sales amount to the centers of NGO “Compassion” is also included in this table.

Table 9.3.6 Sales and Profit of ASAN (October to December 2014)

Unit: FCFA	October	November	December	Total
Sales	91,100	118,250	53,450	262,800
Expenditure	48,425	92,275	18,650	159,350
Profit	42,675	25,975	34,800	25,975,288,000

Source: ASAN account book

The sales and expenditure include the following items.

³¹ The primary schools and kindergartens are holidays on Thursday and Sunday in Burkina Faso in week. Therefore, this NGO looks after children on Thursday that is school holiday.

Sales:	Grinding fees, ice, Tofu brochettes, Tofu, Soy milk yoghurt, Okara, Water, Soybeans, Bisap, Soy juice, Others
Expenditure:	Materials, Gas, Transport, Seasonings, Wages, Fire wood, Repairing, Notebooks, Others

3) Establishment of Food Stand for Tofu Related Food

The Léo city office granted approval and authorization on opening food stand (kiosk) of ASAN on 26 August, 2014, and then ASAN has started the business since October 2014. Food Stand is located alongside the main roads.



< Business hours >: Monday – Saturday (07:00 - 20:00)

< Sold good >: Tofu brochettes, Tofu brochettes (major food), Soy juice, Tofu Sandwich, Okara cookie, cold water, Coffee, Tea, etc.

< Sales system >: Shifting system by 2 women (morning and afternoon)

The profits in Food Stand during 20 October – 31 December, 2014, are shown in the table below.

Table 9.3.7 Sales and Profit of Kiosk (October to December 2014)

Unit: FCFA	October	November	December	Total
Sales	23,100	55,350	62,550	141,000
Expenditure	15,450	46,050	28,431	89,931
Profit	7,650	9,300	34,119	9,300,143,169

Source: ASAN account book

So far, the sales amount and profits have steadily increased as shown above. The problem is that Food Stand (kiosk) is not well-known in the public and the business activities are not worked well (visits to the offices).

(3) Dissemination of Effects of Pilot Activities

It was planned for dissemination of effects of pilot activities that the sales goods were exhibited in food stand which was annexed to film festival “SIAO”, which is held in biannually. But it was cancelled due to the outbreak of Ebola Fever in the West Africa. Since then, its information dissemination through participation into agriculture fair has not been conducted because of political disturbance in Burkina Faso.

As described later, “Training for Improved Tofu Processing Techniques” was organized in Léo city on 14 January, 2015, and the techniques were taught to the participants of women’s processing industries.

(4) Preparation of Extension Materials for Improved Tofu Processing Techniques

1) Extension Manual for Improved Tofu Processing

The following extension manual for improved Tofu processing techniques is prepared as a final output of pilot activities.

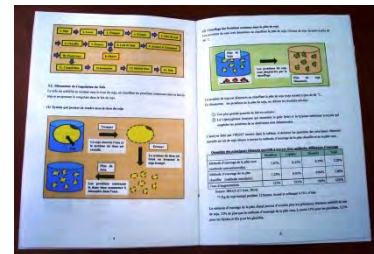
Extension Manual for Improved Tofu Processing

Table of Contents

1. Introduction
2. Constituents and Benefits
 - 2.1. Constituents of Soybeans
 - 2.2. Benefits of Tofu
3. How to make Tofu
 - 3.1. Necessary Materials and Process
 - 3.2. Tofu Coagulation Mechanism
 - 3.3. Variety of Coagulants
4. Tofu Making Process

Appendix:

1. Picture of Heat-up Wring Equipment and Picture of Tofu Forming Equipment
2. Benefits and Recipes of Okara
3. New Coagulants



2) Implementation of Training for Improved Tofu Processing Techniques

As described already, “Training for Improved Tofu Processing Techniques” was held between 10:00-14:00 on 14 January, 2015, for women’s processing industries (outside: 3, inside: 21) who are making Tofu brochettes outside and inside of Léo city. The “extension manual for improved Tofu processing techniques” was distributed to each training participant as reference material. This manual was used in the training, and after explanation of the whole processing, each process was explained with demonstration. The women’s processing industries participated in demonstrations. Mossi language was used in the training instead of French³².



Training Scenery

As the manual was prepared in French, some women are difficult to understand. It is needed to translate into major local languages in the future while using the French manual for trainers.

9.3.3 Lessons Leaned and Issues

(1) More yield of high nutrient Tofu is produced by changing soy milk wring method.

At present, small scale soybean food processing industries (women’s group and cottage industries) in Burkina Faso use raw wring method in order to produce soy milk by wring raw soy past this is produced by grinding soaked soybeans. This time, pilot activities introduces heat-up wring method in order to produce soy milk by wring boiled soy past that is produced by heating grinded soybeans soaked.

The Institut de Recherche en Sciences Appliquées et Technologies (IRSAT) analyzed nutrient component of two different soy milk which was produced by both wring methods. The analyzed results show that heat-up wring method produces more nutrients than raw wring method, which

³² Mossi and Gourounsi of local languages are spoken in Léo city. In this training, Mossi language was used due to the trainer.

component of 15% of Protein, 121% of Lipid, 6% of Carbohydrate. Also, 5kg of soybeans are used to produce Tofu by heat-up method and raw wring method with ASAN, and the volumes of Tofu are weighted. As a result, heat-up method produces about 10 kg of Tofu and raw wring method produces about 7.5 kg of Tofu.

As a conclusion, it is confirmed that more yield and much nutrient of Tofu is produced in the same amount of soybeans by changing to heat-up wring method from raw wring method when small scale soybean food processing industries in Burkina Faso make soy milk.

For side effect of heat-up wring method, trypsin (prevention from digestion) in soybeans will not be necessary to be removed by heating again since Okara which is residuals of soy milk which is extracted from boiled soy past is heated up different from Okara produced by raw wring method.

(2) Tamarind juice is the most suitable locally available Tofu coagulant.

The small scale soybean food processing industries in Burkina Faso use tamarind juice of citric acid in aid coagulation method for Tofu coagulant. The pilot activities produces Tofu in raw wring method by applying several coagulants, beside tamarind juice, 1) Calcium Sulfate (salt), 2) local lemon (acid), 3) commercialized vinegar (acid), 4) mixture of egg shell and vinegar (salt), 5) Bisap juice (acid). Each Tofu is evaluated by 4 items, “yield”, “taste”, “texture” and “compact” by ASAN. The summary of evaluation results by ASAN members are the followings.

Tamarind juice \doteq Calcium Sulfate > Mixture of egg shell and vinegar > Local lemon > Vinegar, Bisap juice

Further, considering price of coagulant, requirements of labor inputs to make coagulant, and condition of final product (brochettes), it is confirmed that conventional tamarind juice is the most suitable coagulant for the small scale Tofu processing industries (women’s groups and cottage industries). Also, the liquid wrung from Tofu making using tamarind juice as a coagulant can be sold as soy juice after adding seasoning, different from other coagulants.

(3) Introduction of soy milk wring equipment and Tofu forming equipment are effective in improving working efficiency.

The small scale soybean food processing industries in Burkina Faso work using with hands to make Tofu (Tofu forming and wring for soy milk). Thus, the pilot activities develop soy milk wring equipment and Tofu forming equipment, which are simple and cheap and can be manufactured in everywhere, from point of view of reduction of labor burden and times, further of prevention from burning.

First of all, analyzing situation of work using with hands for Tofu processing, prototypes of equipment of Tofu forming and soy milk wring are developed on an experimental basis. Then, based on comments of women’s processing group (ASAN members) and actual usefulness of equipment, carpenter in Léo city finalizes them by putting improvements and betterment. Both of equipment are popular in improving working efficiency among ASAN members

For side effect of Tofu forming equipment, it can reduce waste of Tofu in case of sale in brochettes shape due to forming quadrangular prism form of Tofu.

(4) It is necessary to study ways for promotion of utilization and improvement of value adding.

Even though Okara which is produced by-products of Tofu processing is very high nutrition value, so far it is disposed or sold in the rough cheaply for feed. The pilot activities introduce and cook experimentally Okara-based food recipe, “sun-drying (heat-up wring)”, “dry powder (cooking ingredient)”, “deep-fry” and “cookie”, for the means of improvement of value added.

At present, Okara cookies (3 pieces at 50 FCFA) are sold at food stand (kiosk: antenna shop) and the sales amount have been steadily increased. From now on, it is hoped that the small scale soybean food processing industries including ASAN try experimentally and commercialize the Okara-related food which is good-taste for the common people of Burkina Faso. On the other hand, the more Tofu is produced, the more Okara is produced. The most of produced Okara are disposed since all of Okara are not consumed as materials for food processing. For this purpose, it is necessary to find out good ways to use other usage of large amount of Okara beside materials of food processing, like adding value for feed and fertilizers.

(5) Diversification of customers contributes to stable income source.

Usually most of Tofu brochettes are sold in an itinerant trade and on receipt of orders. The pilot activities support diversification of sales customers by delivering goods to NGOs working in the local place and establishing food stand (kiosk)

As stated earlier, diversification of customers contributes to the steady increase of sales amount and profits. However, diversification of customers requires for strengthening of capacity (accountant, processing/selling system, organization management) and improvement of marketing capacity for women's processing groups as it contributes to increase of sales amount and number of customers. Particularly if the members are students and wives, they are required schedule adjustments and cooperation with their family member. Further, diversification of customers enlarges stratum of consumer for Tofu related food and therefore it is necessary to sensitize merits of soybean processed food to various stratum of consumer.

9.3.4 Feedback to Promotion Plan

The pilot activities improve Tofu processing techniques, conduct food processing by use of by-product (Okara), show operational improvement of Tofu related food processing business and increase of profits by diversification of customers. Then, extension manual of improved Tofu processing techniques is prepared as a final output of the pilot activities. This is implemented in advance "project for improvement of knowledge and techniques on Tofu related food processing" in "program for expansion of Tofu related food processing business". From now on, it is expected that dissemination of effects of the pilot activity by using the extension manual will contribute to the expansion of Tofu related food processing business. Particularly newly-introduced soy milk processing techniques is considered core techniques in manufacturing Tofu related food and therefore will be utilized widely other all Tofu related food processing.

Moreover, experience and knowledge to train women's processing groups by using the extension manual will be used when the project is implemented in the future.

9.4 Promotion Plan for Soybean

9.4.1 Framework for the Promotion Plan

(1) Principle of Planning

At the start for formulating promotion plan for soybean, firstly, three (3) pillars for formulating plan are established for promotion of the related industries by soybean production in the country. Two pillars are development of each value chain for feed processing and food processing, and one pillar is the organizing of soybean filière stakeholders to facilitate development of two value chains.

As for value chain of feed processing, promotion measure is formulated from point of view of supplying needed soybeans smoothly to the domestic market for actual users such as feed processing industries and animal feeding farmers (including poultry). It results in changing in attitude of not selling soybeans by producing but producing of soybeans for sales.

As for value chain of food processing, promotion measure is formulated from point of view of improving value added on soybeans that are produced as target crop for food security. To this end, Tofu related food processing business is promoted by improving knowledge and techniques for soybean food processing and at the same time sensitization of soybean processed food.

Lastly, as for organizing soybean filière stakeholders, it is propelled to organize stakeholders aiming at tackling common issue of stakeholders but not to organize stakeholders aiming at establishing organization of stakeholders.

(2) Target Duration

The target duration is 5 years after its start.

(3) Target Area

The Plan targets the high production areas of soybeans, namely Est region, Centre-Est region, Centre-Ouest region, Centre-Sud region, Hauts-Bassins region, Sud-Ouest region, Cascades region and Central region. The total production of 8 regions is account for about 93% of national production during the period 2002-2013.

(4) Vision

The plan selects 3 promotion measures to facilitate promotion of in-country related industries by soybean production. Then, by propelling each measure stated in the plan, soybean distribution volume in the domestic market is expanded in response to growing demand of the actual users, and small scale business for soybean food processing to generate income and employment is developed and organizing of stakeholders to be able to tackle issues of soybean filière is progressed. As a result, soybeans production is to be increased because soybeans consumption by the general consumers is increased as soybean related industries such as feed processing industries, animal breeding formers and small scale food processing industries are developed. Therefore, vision for the plan is placed on “improvement of income for soybean production farmers through promotion of soybean related industries”.

Also, the plan focuses on mainly two value chains in the country, but if soybeans supply volume in the domestic market is increased, increase of exporting soybeans to sub-regional countries is expected. In this case, soybean production farmers will be benefitted since soybean production is further increased.

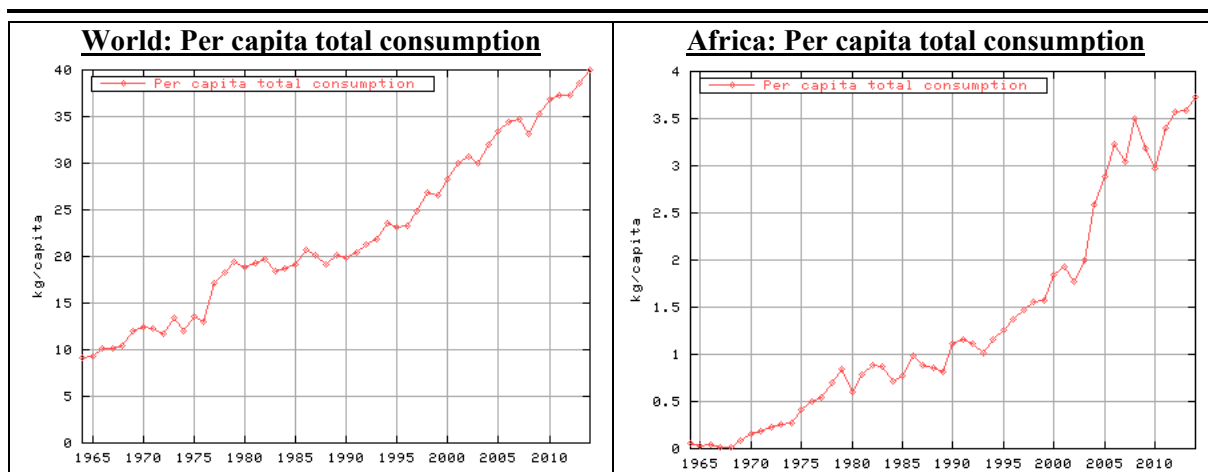
(5) Goal

The implementation of the plan leads to promotion of soybean related industries and then to be resulted in increase of annual soybean consumption (= production) per capita in Burkina Faso. To this end, as an indicator to show degree of achievement and realization of vision of the plan, increase of annual soybean consumption (= production) per capita in Burkina Faso is utilized for the target of the plan.

Here, assuming that soybeans produced in Burkina Faso are all consumed in the country, annual consumption (= production) per capita is at about 1.39 kg in 2012³³.

The annual total soybean consumption per capita for world and Africa is the followings.

³³ Population of Burkina Faso is about 17,482,000 people in 2012 (UNDP “Report on Human Development 2013”). Soybean production is 24,305,000kg (FAOSTAT).



Source: USDA: PS&D Online December 2014; USBC: International Data Base, August 2006

Fig. 9.4.1 Total Soybean Consumption per Capita for World and Africa

Soybean consumption per capita of Africa (3 kg/capita) in 2010 is accounted for about 8% of that of world (37 kg/capita), and soybean consumption per capita of Burkina Faso (2012: 1.4 kg/capita) is accounted for about 46% of that of Africa.

Assuming that the plan is implemented till 2020 and annual soybean consumption per capita of Burkina Faso is increased at the same level of that of Ghana (2.0 kg in 2012: MARHASA), about 44,000 tons of soybean production is needed³⁴.

The average yield per ha of Burkina Faso for past 5 years (2009-2013) is at 1.21 t/ha (FAOSTAT) so that about 36,363 ha of cultivation area is necessary to produce about 44,000 tons. As cultivation area was 22,198 ha (calculated in FAOSTAT) in 2012, about 14,168,000 ha of cultivation area is necessary. Seeing from production, as about 24,000 tons (FAOSTAT) was produced in 2012, about 20,000 tons are necessary to be increased till in 2020. It conclusion, the plan sets its target to increase 1.8 times more of soybean production and 1.6 time more of cultivation area.

9.4.2 Promotion Strategies and Programs

The promotion strategies and programs to achieve the vision above are stated below. Following the promotion measures mentioned in the section 9.2.2, the promotion strategies for soybean are 1) Increase of distribution volume of soybeans in domestic market, 2) Promotion of small scale business for soybean-processed food and 3) Strengthening of soybean filière.

(1) Increase of Distribution Volume of Soybeans in Domestic Market (Promotion Strategy 1)

To realize “Promotion Strategy 1: Increase of Distribution Volume in the Domestic Market”, “Program for Increase of Supply Volume in the Domestic Market” is established. This program increases soybean supply volume in the domestic market by implementation of two projects described below.

On the start of implementation of the program, two projects are implemented in the same area and same time to improve synergistic effect.

1) Improvement of Soybean Productivity and Increase of Soybean Production Volume

The production farmers have the limitation to expand cultivation area because of lack of agricultural materials, completion of land use with food crops and cash crops and problems of distribution labor input. These problems are reduced by distribution of soybean seeds free of charge and by

³⁴ According to United Nations, population of Burkina Faso is estimated at about 22 million people in 2020.

introduction of soybeans as crop for cotton crop-rotation system. As a result, cultivation land for soybeans is ensured. For this purpose, it should support for efforts of DPARHASA to distribute soybean seeds free of charge to each commune. Also, efforts of SOCOM which distribute soybean seeds free of charge to cotton growing farmers in the eastern regions as rotation crop are applied for SFITEX and Faso Coton. High yield varieties are introduced for the free seed distribution system to improve soybean productivity and increase the production volume.

DGPV, DPARHASA, SOCOMA, SFITEX and Faso Coton should create database of area and production farmers whom soybeans are distributed free of charge. This database will be utilized for activities to improve distribution system.

With respect to procurement cost of certified soybean seeds from INERA, counterpart fund of KR-1 and KR-2 of Japanese government may be utilized. The seeds to be distributed through DPARHASA will be free of charge and seeds to be distributed through 3 cotton companies will be subsidized.

2) Improvement of Distribution System

In order to supply produced soybeans smoothly into the domestic market, it is necessary for production farmers to reduce sales risk (price and buyers) and for collectors to reduce transaction cost. Among measures for reduction of sales risk for production farmers and of transaction cost for collector, only information sharing and establishment of accumulation point and collection period between collectors and production farmers will be taken up as a measure to be tackled urgently.

For this purpose, DPARHASA in major soybean production area as being center of participants should set up matching meetings before soybean harvesting period for information exchange and sharing on production volume of production farmers (group), purchasing volume of collectors, price and delivery point/ place/way with participation of local collectors, production farmers (groups) and the wishing processing industries.

In these matching meetings, database to be created by PASA, SOCOMA, SFITEX and Faso Coton for area and production farmers whom soybeans are distributed free of charge will be utilized. Further, it is necessary beforehand to create database of information on formula feed processing industries, livestock industries, poultry farming, food processing companies, urban collectors in the consumption area, as well as on major collectors in each province and region. This kind of creation of database and information sharing among soybean filière stakeholders will be conducted by activities in the program for support for organizing soybean filière. Particularly, the important issue in the matching meeting is credibility of the participants so that DPARHASA should carefully select the participants.

(2) Promotion of Small Scale Business for Soybean-processed Food (Promotion Strategy 2)

To realize “Promotion Strategy 2: Promotion of Small Scale Business for Soybean-processed Food”, “Program for Expansion of Tofu related Food Processing Business” is established. This program expands Tofu related food processing business by implementation of two projects described below.

1) Sensitization of Soybean-processed Food

Since Burkina Faso has a short history of soybean cultivation, soybean processing is the new field and support from the government of Burkina Faso and donors are insufficient, degree of recognition for soybean processed food is lower in the general consumers. To this end, consumption of soybean processed food is still limited in the domestic market. Actually, lessons learned from the pilot activities show that understanding for soybean processed food is a key to diversifying consumers by small scale soybean-processed food processing industries. Therefore, the advantages of high nutrition and healthy food are sensitized to the general consumers through mass media such as

newspaper, TV. And radio, etc., school education, agriculture extension, participation in trade fairs, organization of soybean fair, etc. This project is jointly implemented with support to soybean core group described later.

2) Improvement of Knowledge and Techniques on Tofu related Food Processing

The cottage industries and women processing groups in the rural area do not well utilize, beside soybean Soumbala, the merits of soybean due to lack of knowledge and techniques on food processing and limitation of variety of soybean processed food.

Thus, the extension materials are prepared in simple and practical way in order to improve business operation and to increase profits, including introduction the new tofu related food, in response to the common issues such as diversification of proceeded food and increase of sales volume, reduction of labor input, improvement of profitability, creation of secure market, improvement of hygiene, etc., by improving knowledge and techniques on Tofu related food which are major food item for small scale business for soybean-processed food. Next, by using extension materials, tofu related food is expanded through i) support of establishment of new business of tofu related food, ii) support of adaptation of tofu related food in food processing industries, iii) guidance for improvement of business operation and increase of profits in tofu related food processing industries. In addition, it is facilitated to organize soybean filière stakeholders by establishing networks among the stakeholders above.

(3) Strengthening of Soybean Filière (Promotion Strategy 3)

To realize “Promotion Strategy 3: Strengthening of Soybean Filière”, “Program for Support of Organizing Soybean Filière” is established. This program organizes Soybean Filière stakeholders by implementation of the two projects described below.

1) Strengthening of Capacity and Function of the Soybean Core Group

The soybean core group (group noyau) has been created already by 24 organization representatives in soybean filière supported by DGPER but the activities have not been conducted.

Thus, by supporting efforts of DGPER, the inactive soybean core group is reactivated prepares action plan for promotion of soybean filière. Then, based on the plan, it implements activities, conduct monitoring and evaluation and revise the plan. The action plan includes creation of database on filière stakeholders of soybean production organizations, feed prosing industries, livestock industries, poultry farming, food processing industries and collectors as well as of major local collectors in each region and province. Then, information such as created database is up-loaded in homepage for the public and support is provided to make networking of stakeholders. In addition, sensitization of soybean processed food is actively implemented as stated before. Through these activities, capacity of function of the soybean core group (group noyau) is strengthened.

2) Promotion of Organization and Cooperation of Filière Stakeholders

Since soybeans are the new crops and their production volume is not large, organization of filière stakeholders is not so progressed. The government of Burkina Faso has provided organizing supports but it is not sufficient enough so that supports are no more than forming groups and have not reached to establishment of umbrella organizations and collaboration of stakeholders.

Thus, it is promoted to organize filière stakeholders through collaboration with the soybean core group whose organization capacity is strengthened by the project above, together with support for efforts of the DGPER. It is aimed to establish collaboration system for filière stakeholders through strengthening function and collaboration of stakeholders in sub-sector and facilitating cooperation

of stakeholders between sub-sectors by support of reviewing policies, systems and structures which are common issues among filière stakeholders. As examples of common issues among filière stakeholders, for farmer organizations, there are issues of strengthening of bargaining power, improvement of negotiation power, efficient acquisition of techniques and information, etc. For feed processing industries, there are common issues of reduction of custom duties on feed materials and cheeks, slack of establishment of soybean quality standards and feed composition standards. For production farmers and collectors, there is issue of careful selection of impurities. However, discussion between producers and collector and sensitization to producers for cleaning impurities are important. It is difficult to introduce cleaning machineries to producer's level from point of view of fund and increase of production cost.

9.4.3 Projects

(1) Project for Increase of Supply Volume in the Domestic Market

1) Background and Objective

As soybean demand is rapidly growing in the domestic market, it is necessary to increase urgently soybean supply volume for the domestic market, considering constrains of production farmers and collectors. Therefore, 2 projects, "Improvement of soybean productivity and increase of soybean production volume by distribution of free certified seeds" and "Improvement of soybean distribution system by reduction of sales risks of production farmers and transaction cost of traders", in program for increase of supply volume in the domestic market are implemented together in the same area at the same time as one project.

As a process of this project, firstly, one province each is selected from responsible areas of each cotton companies. The project is implemented for 2 years in small scale on trial in the selected provinces. Lessons learned and issues are extracted from the implementation results to reflect them in the full scale implementation. Simultaneously, seed production farmers are supported. After that, the full scale project is implemented in the whole target area for 3 years.

The project aims in increasing soybean supply volume in the domestic market to meet the demand for soybeans for feed materials that is increasing quickly in Burkina Faso.

2) Target Area

Major soybean production provinces in the 8 regions (Est, Centre-Est, Centre-Ouest, Centre-Sud, Hauts-Bassins, Sud-Ouest, Cascades, Central) that are target area of this promotion plan

3) Stakeholders and Target Group

Stakeholders: DGPER, DGPV, DRARHASA, DPARHASA ,SOCOMA, SFITEX, Faso Coton, INERA, etc.

Target Group: Production farmers, Collectors, Users in the consumption areas etc. in the target provinces.

4) Activities and Actors

Table 9.4.1 Activities and Actors of Project for Increase of Supply Volume in the Domestic Market

Activity	Actor	Contents of Activity
1. Selection of target provinces for pilot	DGPV, DGPV, DRARHASA, DPARHASA, SOCOMA, SFITEX, Faso Coton	Each province will be selected out of responsible soybean production provinces of SOCOMA, SFITEX and Faso Coton
2. Preparation of list on wishing participants		List of stakeholders (production farmers, cotton growing farmers, collectors, etc.) in each province is prepared. Also, list of wishing actual users in consumption area.
3. Distribution of seeds		Seeds are procured from INERA, etc. and distributed them to production wishing farmers through DRARHASA/DPARHASA, SOCOMA, SFITEX and Faso Coto in target province. The list for received farmers is prepared.
4. Provision of trainings and technical instruction on soybean cultivation and support for seed production farmers		DRARHASA/DPARHASA provides technical training for wishing production farmers (distribution of technical sheet for soybean cultivation techniques). Producers who hope to produce seeds are supported.
5. Organization of matching meetings for stakeholders		Information exchange and sharing is conducted by participants by each DRARHASA/DPARHASA in the target 3 provinces.
6. Evaluation of implementation results in each province		The lessons and issues are extracted for full scale implementation.
7. Selection of target provinces for full scale		The target provinces are selected in the responsible soybean production provinces of SOCOMA, SFITEX and Faso Coton.
8. Preparation of list on wishing participants		List of stakeholders (production farmers, cotton growing farmers, collectors, etc.) in each province is prepared. Also, list of wishing actual users in consumption area is renewed.
9. Distribution of seeds		Seeds are procured from INERA, etc. and distributed them to production wishing farmers through DRARHASA/DPARHASA, SOCOMA, SFITEX and Faso Coto in target province. The list for received farmers is prepared.
10. Provision of trainings and technical instruction on soybean cultivation		DRARHASA/DPARHASA provides technical trainings for wishing production farmers. (distribution of technical sheet for soybean cultivation)
11. Organization of matching meetings for stakeholders		Information exchange and sharing is conducted by participants by each DRARHASA in the target provinces.

5) Implementation Schedule

Table 9.4.2 Schedule of Project for Increase of Supply Volume in the Domestic Market

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Selection of target provinces for pilot	DGPER, DGPV, DRARHASA, DPARHASA, SOCOMA, SFITEX, Faso Coton	■				
2. Preparation of list on wishing participants		■	■			
3. Distribution of seeds		■	■			
4. Provision of trainings and technical instruction on soybean cultivation (including seed production support)		■	■			
5. Organization of matching meetings for stakeholders		■	■			
6. Evaluation of implementation results in each province.		■	■			
7. Selection of target provinces for full scale				■		
8. Preparation of list on wishing participants				■	■	■
9. Distribution of seeds				■	■	■
10. Provision of trainings and technical instruction on soybean cultivation				■	■	■
11. Organization of matching meetings for stakeholders				■	■	■

6) Expected Effectiveness

It is expected that production is increased in the soybean production provinces in the responsible provinces of SOCOMA, SFITEX and Faso Coton. And then produced soybeans are supplied smoothly to the users through the collectors who are already matched beforehand. The network for stakeholders is established and database for soybean production farmers, and collectors and users (feed processing industries in the urban area) are created in the target provinces.

(2) Project for Sensitization of Soybean-processed Food

1) Background and Objective

As the degree of recognition of soybean processed food in the general consumer is low in Burkina Faso, the consumption volume is still limited in the domestic market. Upon this, it aims to stimulate the domestic consumption of soybean processed food and also to sensitize the general consumers in advantages of soybean processed food in order to create better environment for expansion of Tofu related food processing business. This project is implemented actively by the soybean core group as one of activities of “Strengthening of Capacity and Function of the Soybean Core Group”

2) Target Area

It covers the whole of Burkina Faso and focuses on two major cities, Ouagadougou and Bobo-Dioulassor

3) Stakeholders and Target Group

Stakeholders: DGPER, Soybean Core Group

Target Group: General consumers in Burkina Faso

4) Activities and Actors

Table 9.4.3 Activities and Actors of Project for Sensitization of Soybean-processed Food

Activity	Actor	Contents of Activity
1. Formulation of implementation plan for sensitization	DGPER, Soybean Core Group	The implementation plan for sensitization for 2 years is formulated.
2. Preparation of sensitization materials for each medium		The optimum sensitization materials are prepared appropriated for newspapers, radio, TV, magazines, school education and agriculture extension.
3. Implementation of the plan		The sensitization activities are conducted by each medium and reviewed based on the evaluation results.
4. Participation in general fairs		The soybean-processed products are advertised through participation in the domestic fairs.
5. Holding soybean fair		The fair for soybean-processed products is organized in Ouagadougou once a year.

5) Implementation Schedule

Table 9.4.4 Schedule of Project for Sensitization of Soybean-processed Food

Activity	Responsible Organization	1 st Year	2 nd Year
1. Formulation of implementation plan for sensitization	DGPER, Soybean Core Group	■	
2. Preparation of sensitization materials for each medium		■	
3. Implementation of the plan for sensitization		■■■■■■■■■■	■■■■■■■■■■
4. Participation in general fairs		■■■■■■■■■■	■■■■■■■■■■
5. Holding soybean fair		■	■

6) Expected Effectiveness

It is expected that small scale business for soybean-processed food (group) are created in various areas of the country as merit of high nutrition value and healthy food is penetrated in each stratum in society of Burkina Faso and customer interest in soybean processed food is raised. Also, it is expected to contribute that information sharing among soybean-processed food processing industries are facilitated and soybean processed food are introduced and disseminated to the various area of the country through participation in many type of fairs and organizing soybean fairs. On the other hand, capacity and function of the soybean core group is strengthened by conducting actively planning and implementation of this project.

(3) Project for Improvement of Knowledge and Techniques on Tofu related Food Processing

1) Background and Objective

The small scale soybean -processed food processing industries are lack of knowledge and techniques on soybean -processed food processing and there soybeans are not fully utilized as variety of soybean processed food is limited. Thus, in order to expand usage of soybean processed food, targeting Tofu related processing food which is major item for small scale soybean -processed food processing industries knowledge and techniques of Tofu related food processing. Then, by preparing and introducing extension materials for tofu related food, including introduction of the new tofu related food, it aims to support for expansion of tofu related processing business for improvement of business operation and profitability. Together with this, with respect to Tofu related food processing, quality of soybeans, food additive such as coagulation, manufacturing method and

standards for conservation methods are formulated.

The results of research on actual condition for Tofu related food processing industries to be conducted in several areas are uploaded in homepage as described later and are utilized as tools to create networks of Tofu related food processing industries.

2) Target Area

The target area is designed for the area where most of tofu related food processing industries are located in the target 7 regions of the promotion plan.

3) Stakeholders and Target Group

Stakeholders: DGPER (DTAN, DPEFA), DRARHASA, DPARHASA, Soybean Core Group, ABNORM, etc.

Target Group: i) newly established tofu related food manufacturers, ii) manufacturers to intend to process tofu related food, iii) manufacturers who are processing tofu related food.

4) Activities and Actors

Table 9.4.5 Activities and Actors of Project for Improvement of Knowledge and Techniques on Tofu related Food Processing

Activity	Responsible Organization	Contents of Activity
1. Processing trial and commercialization of new Tofu related food and introduction of knowledge and techniques	DGPER, DRARHASA, DPARHASA, ABNOR, Soybean Core Group, Women Groups, Cottage Industries	The new tofu related food accepted by the consumers in Burkina Faso is developed and introduced.
2. Formulation of standard on soybean and soybean processed food		Standards for soybean quality, food additive, manufacturing method and conservation methods are established.
3. Preparation of extension materials for Tofu related food		The extension materials of tofu related food are prepared through results of workshops that the manufacturers participate.
4. Implementation of survey on actual condition of Tofu related food processing industries in several areas.		The database is created through research on actual condition of Tofu related food processing industries in several areas.
5. Formulation of extension plans on Tofu related food in several areas		Based on results of research, extension plans on Tofu related food in several areas are formulated.
6. Implementation of the extension plans		Extension activities for tofu related food are conducted in the areas where the research is conducted.
7. Follow-up activities for individual industries.		Visits are conducted to the participants in workshops and individual guidance is conducted.

5) Implementation Schedule

Table 9.4.6 Schedule of Project for Improvement of Knowledge and Techniques on Tofu related Food Processing

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	
1. Processing trial and commercialization of new Tofu related food and introduction of knowledge and techniques	DGPER, DRARHASA, DPAHASA, ABNOR, Soybean Core Group, Women Groups, Cottage Industries	██					
2. Formulation of standard on soybean and soybean processed food.		██████████					
3. Preparation of extension materials for Tofu related food		██					
4. Implementation of survey on actual condition of Tofu related food processing industries in several areas.		██████████					
5. Formulation of extension plans on Tofu related food in several areas.		████████████████████					
6. Implementation of the extension plans			██				
7. Follow-up activities for individual industries.				██			

6) Expected Effectiveness

It is expected to contribute to diversification of sales items and increase of sales volume for soybean-processed food and to operational improvement and improvement of rate of return for Tofu related food processing industries (women's group) by developing and extending Tofu related food which are fitted to tastes of the people of Burkina Faso based the established standards. As a result, it is expected to expand cash income and number of employment by small scale business for soybean -processed food processing.

(4) Project for Strengthening of Capacity and Function of the Soybean Core Group

1) Background and Objective

The soybean core group (group noyau) was created in May 2012 by 24 organizations concerned with support of DGPER but has not conducted substantial activities up to now.

Thus, by supporting efforts of DGPER, as well as by supporting for reactivation of inactive soybean core group to prepare and implement action plan for promotion of soybean filière, and it is aimed at strengthening capacity and function of the group. The soybean core group will implement actively to sensitize soybean-processed food.

2) Target Area

The target area is set in Ouagadougou where the members of soybean core group are easily assembled.

3) Stakeholders and Target Group

Stakeholders: DGPER, DOPAIR, Ministry of Animal Resources, etc.

Target Groups: Soybean Core Group

4) Activities and Actors

Table 9.4.7 Activities and Actors of Project for Strengthening of Capacity and Function of the Soybean Core Group

Activity	Actor	Contents of Activity
1. Formulation of 2-year action plan.	Soybean Core Group	The 2-year action plan is formulated for promotion of soybean filière
2. Implementation of the action plan and monitoring		Based on the 2-year action plan, the activities, monitoring and evaluation and modification of the action plan are implemented. The capacity strengthening trainings are provided to the soybean core group if necessary.

5) Implementation Schedule

Table 9.4.8 Schedule of Project for Strengthening of Capacity and Function of the Soybean Core Group

Activity	Responsible Organization	1 st Year	2 nd Year
1. Formulation of 2-year action plan.	Soybean Core Group	■	
2. Implementation of the action plan and monitoring		■	■

6) Expected Effectiveness

It is expected that since the project is implemented by the soybean core group, its capacity and function are established for nucleus for creation of future inter-professional organization for soybean filière. Further, it is expected to promote networking with filière stakeholders by taking part in the activities of other projects.

(5) Project for Promotion of Organization and Cooperation of Filière Stakeholders

1) Background and Objective

The support for organizing filière by the government of Burkina Faso DGPER is not sufficient and its supports are no more than forming individual groups and have not reached to establishment of umbrella organizations and collaboration of stakeholders.

Upon this, it is promoted to organize soybean filière stakeholders in collaboration with the soybean core group which is strengthened its functions by the project above, together with support for efforts of the government of Burkina Faso. This project provides support for the implementation of the promotion plan from aspect of system and institution on the one hand and for reviewing common issues for stakeholders such as policies, systems and structures. Through providing such supports, it is aimed to establish collaboration system for filière stakeholders by strengthening function and collaboration in stakeholders in sub-sector and facilitating cooperation of stakeholders between sub-sectors.

2) Target Area

The target area is designed for the whole of Burkina Faso in general and the target 7 regions of the promotion plan in particular.

3) Stakeholders and Target Group

Stakeholders: DGPER, DOPAIR, DRARHASA, DPARHASA, Chamber of Agriculture, Chamber of Commerce, Soybean Core Group, etc.

Target Groups: Soybean production farmers, Actual users (soybean food manufacturers, feed

manufacturers, industrial goods manufacturers, etc.), Animal breeders and Poultry farmers, etc.

4) Activities and Actors

Table 9.4.9 Activities and Actors of Project for Promotion of Organization and Cooperation of Filière Stakeholders

Activity	Actor	Contents of Activity
1. Organization of the filière stakeholders	DGPER, DOPAIR, DRARHASA, DPARHASA, Chamber of Agriculture, Chamber of Commerce, Soybean Core Group	Organizing soybean filière stakeholders is promoted in cooperation with the soybean core group.
2. Formulation of action plans		Action plans of each sub-sector are formulated.
3. Implementation of the action plans and monitoring		Based on the action plans, the activities, monitoring and evaluation and modification of the action plans are implemented. The capacity strengthening trainings are provided to the organizations, if necessary.

5) Implementation Schedule

Table 9.4.10 Schedule of Project for Promotion of Organization and Cooperation of Filière Stakeholders

Activity	Responsible Organization	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1. Organization of the filière stakeholders	DGPER, DOPAIR, DRARHASA, DPARHASA, Chamber of Agriculture, Chamber of Commerce, Soybean Core Group					
2. Formulation of action plans						
3. Implementation of the action plans and monitoring.						

6) Expected Effectiveness

It is expected to be solved problems in sub-sectors, between sub-sectors and for whole sector by soybean filière stakeholders. By this effort, it is also expected to facilitate networking towards for creation of future inter-professional organization for soybean filière through strengthening capacity and function of organizations of stakeholders.

9.4.4 Implementation Structure and Project Cost

(1) Implementation Structure

DGPER serves as overall coordination institution for three programs and has responsibility of execution and supervision of the whole plan under this promotion plan. Also, DGPER regularly organizes coordinating meeting with implementation organizations and stakeholders and then conduct coordination/ planning, communication and problem-solving.

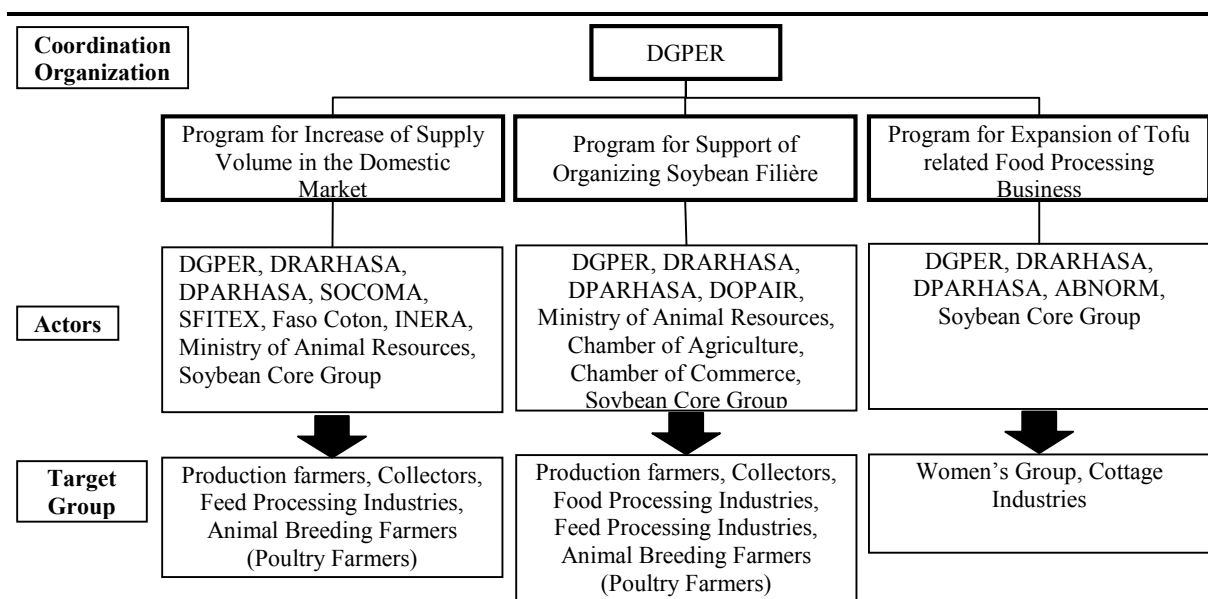


Fig. 9.4.2 Implementation Structure for Soybean Promotion Plan

(2) Important Notices on the Implementation

1) Program for Increase of Supply Volume in the Domestic Market

On the implementation of the program for increase of supply volume in the domestic market, the followings should be taken notices.

- a) DGPER, DRARHASA, DPARHASA, SOCOMA, SFITEX, Faso Coton, INERA, Ministry of Animal Resources and Soybean Core Group are major actors of this program.
- b) SOCOMA, SFITEX and Faso Coton distribute soybean seeds to cotton growing farmers (groups) and create list of distributed farmers in their responsible soybean production provinces. Also, they provide technical instruction for soybean cultivation according to the farmers' needs.
- c) The on-going seed distribution activity to the production farmers (groups) is expanded in DPARHASA responsible provinces, and technical instruction for soybean cultivation is provided according to the farmers' needs. DPARHASA, together with DRARHASA, prepares database on soybean production farmers and local collectors. Also, they organize matching meetings for stakeholders before harvesting. Ministry of Animal Resources provides supports for creation of database on feed processing industries and animal breeding farmers (poultry) in the consumption areas. The soybean core group supports for creation of database, and opens it on homepage. INERA multiplies certified soybean seeds in receipt of request of DGPER.
- d) It is important to agree about subsidy to the 3 cotton companies for seed distribution and multiplication of certified seeds by INERA through conducting fully discussion and coordination with concerned organizations including DGPER and DGPV.

2) Program for Expansion of Tofu related Food Processing Business

- a) DGPER, DRARHASA, DPARHASA, ABNORM and Soybean Core Group are major actors of this program.
- b) DGPER implements the activities in collaboration with DRARHASA and DPARHASA. On the other hand, the soybean core group implements actively "Project for Sensitization of Soybean-processed Food" and opens the results of survey on actual condition of Tofu related food processing industries in several areas on homepage.

-
- c) With respect to “Project for Sensitization of Soybean-processed Food”, mass media as tools of sensitization is described. However, it is paid attention to the stratum for sensitization (house wives, farmers, students, infants, etc.) and to local languages to disseminate.
 - d) With respect to “Project for Improvement of Knowledge and Techniques on Tofu related Food Processing”, it should not limit for Tofu related processed food. For example, “Soy meat” is possible to be introduced that tastes are liked by the people of Burkina Faso. It must conform to follow the established standards at the start of processing Tofu related food.

3) Program for Support of Organizing Soybean Filière

- a) DGPER, DRARHASA, DPARHASA, DOPAIR, Ministry of Animal Resources, Chamber of Agriculture, Chamber of Commerce and Soybean Core Group are major actors.
- b) Conforming “law on filière inter-professional organization for agriculture, forestry, fisheries and livestock (loi 050-2012/AN)”, DGPER, DRARHASA, DPARHASA, DOPAIR, Chamber of Agriculture and Chamber of Commerce organize stakeholders of producers, processors, distributors/exporters, etc. at each level of commune, district, province and region based on “concept note for organizing agriculture filière” prepared in 2010 by DGPER. Ministry of Animal Resources supports feed processing industries and animal breeding farmers (poultry) in organizing them and conducts meetings to discuss the common issues for these businesses. The soybean core group supports in organizing filière stakeholders and conducting the meetings.
- c) The soybean core group should implement actively “Project for Sensitization of Soybean-processed Food” in “Project for Strengthening of Capacity and Function of the Soybean Core Group”.
- d) In addition, the soybean core group supports in creating database of soybean filière stakeholder in “Project for Increase of Supply Volume in the Domestic Market”.
- e) The soybean core group is a main actor of collaboration such as opening of homepage for information sharing of the results of survey on actual condition of Tofu related food processing industries in several areas under “Project for Improvement of Knowledge and Techniques on Tofu related Food Processing”.
- f) The soybean core group supports the government of Burkina Faso (DGPER) for the current efforts of organizing production organizations and food processing industries and conducts information sharing and dissemination in homepage through creation of database in “Project for Promotion of Organization and Cooperation of Filière Stakeholders”.

(3) Project Cost

The estimated project cost for implementation of this promotion plan for soybean is shown in the table below.

Table 9.4.11 Estimated Project Cost of the Promotion Plan for Soybean

[Unit: FCFA]

Project		1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
1. Increase of Supply Volume in the Domestic Market	Improvement of Soybean Productivity	44,892,000	44,892,000	217,752,000	217,752,000	217,752,000	743,040,000
	Improvement of Distribution System						
2. Sensitization of Soybean-processed Food		36,355,000	23,105,000				59,460,000
3. Improvement of Knowledge and Techniques on Tofu related Food Processing		89,903,000	95,501,150	63,185,850	26,000,000	16,500,000	291,090,000
4. Strengthening of Capacity and Function of the Soybean Core Group		36,960,000	30,060,000				67,020,000
5. Promotion of Organization and Cooperation of Filière Stakeholders			46,560,000	141,811,200	82,291,200	70,905,600	341,568,000
Total		208,110,000	240,118,150	422,749,050	326,043,200	305,157,600	1,502,178,000

* Allowance and transportation fee of MARHASA officials and hired staffs are included. Their salaries are not included.

9.4.5 Conclusion

- (a) Soybeans are difficult to cultivate in the regions under Sahel climate zone (annual average rainfall of 300-600 mm) in Burkina Faso but are possible to cultivate in the area where rainfall are higher than Sahel climate zone. The major soybean production areas are largely divided into traditional cultivation areas (Est region, Centre-Est region) and cotton growing areas.
- (b) However, soybeans have more advantages for the small-scale farmers as soybeans are relatively easily cultivated, high redeemable crop, possible to store longer period, and contribute to fertilization of soil (prevention of deterioration of soil). Further, soybeans are placed important crop since one of agriculture crops for national food security designated by MARHASA. On the other hand, comparing with other crops, and also have high induction effects for those industries
- (c) In this manner, recently the production of soybeans in the country has been rapidly increased due to increase of demand for high quality and inexpensive ingredient of animal feed and increase of consumption of soybean processed food for high nutrition and healthy food. Indeed, the annual national production has been increased by 9.6 times from 2,533 to 24,305 tons for 11 years from 2002 to 2012. Also, recently many small scale soybean processed food processing industries and feed processing industries (roasted soybeans) have been established. Particularly food processing industries contribute for rural women to precious cash income sources. It is expected that soybeans demand in the domestic market is increased as the merit for high quality and inexpensive ingredient of animal feed is from now on understood and penetrated by and in animal breeding famers (poultry).
- (d) Certainly, the soybean consumption has been rapidly increased worldwide, and it is anticipated from now on that the consumption of meat, dairy products and eggs will be increased due to economic growth and change of eating habits. It is certain that soybean demand is continuously increased allover the world. However, it is difficult to export Burkina Faso soybeans in terms of price and quality³⁵. To this end, target markets for Burkina Faso soybeans are first for growing domestic market, then sub-regional markets for ordinary soybeans and niche market in West Europe for non-GMO organic soybeans.
- (e) As the production farmers responses soybean liver demand in the country, and then according to the related industries develops, trade volumes is increased so that soybean production is increased. As a result, by farming virtuous circle of development of soybean related industries and increase of production, it is expected to increase income for soybean production farmers.

³⁵ International price (annual average) in 2014 was 46.5 cents/kg. This will convert to about 256 FCFA/kg with 1USD=0.84Euro and 1Euro=655 FCFA. On the other hand, collectors buy at 260 FCFA/kg from the production farmers in the Burkina Faso and in Ouagadougou retail price was at about 300 FCFA/kg. (December 2014).

Chapter 10 Implementation Structure

10.1 Implementation Structure

For smooth implementation of the M/P, “Project implementation unit” is established to implement the M/P. DGPER supervises it technically.

Composition and Function of the Project Implementation Unit

Composition

The project implementation unit consists of a unit chief and temporally transferred staffs.

Unit Chief: Senior staff of MARHASA, who has wealth of knowledge on agricultural economics and the rank of project manager.

Staff: Temporally transferred staffs from general directorates of MARHASA and DRARHASAs shown in the Fig. 10.1.1.

Function

- i) Reporting regularly to DGPER and the Section in charge of promotion of market oriented agriculture
- ii) Prioritizing the promotion plans of the 4 crops (programs and projects) that are proposed in the M/P and which budgets are accepted.
- iii) Formulating detailed implementation plans of the programs and the projects prioritized in the above ii)
- iv) Implementing, managing and monitoring the projects in accordance with the implementation plans formulated in the above iii)
- v) Reviewing the implementation results

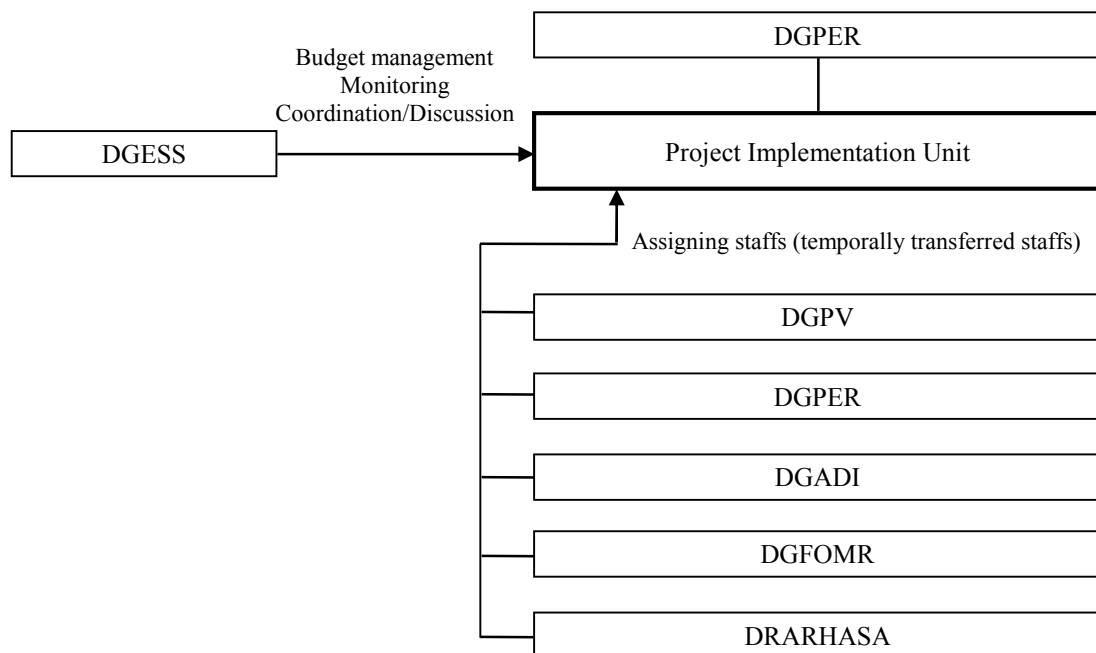


Fig. 10.1.1 Implementation Structure (draft)

Chapter 11 Recommendations

11.1 Recommendations for Each Agricultural Product

11.1.1 Mango

- (a) The promotion plan for fresh mango exports proposes targeting the markets of non-EU Europe, Mediterranean countries and Persian Gulf countries where current exports are still limited. It is also proposed to accelerate the sales promotion by exporters. “Project for Acceleration of APEMAB’s Activities to Gather Export Marketing Information in order to Determine the Target Countries” is considered to be a priority project since it is the starting-point.
- (b) The promotion plan for dried mango exports strongly recommends improving hygiene/food safety in the drying facilities to fulfill the requirements of EU Regulation to assure the current outlet as well as to export to new market of developed countries. “Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs” is considered as a priority project.
- (c) CIR-SNV PROJECT (commenced in July 2014) has the budget to procure small equipment and tools and PTRAMAB has submitted the proposal for the Japan-made equipment for ATESTA dryer modification used in the pilot activity in January 2015. This project has a plan to support the improvement of 10 facilities. Major inputs of CIR-SNV PROJECT are trainings and they cover processing, hygiene and quality improvement.
Thus, there is overlap with this Promotion Plan. It is recommended that DGPER starts the dialogue with CIR-SNV PROJECT to propose the implementation of a part of this Promotion Plan by CIR-SNV PROJECT.
- (d) In the value chain of fresh/dried export, exporters play important roles of funding and improving the quality. The serious problem for them to expand the exports is a limited fund. Regarding financial support, MEBF provided a fund for development of export potential endowed by World Bank but the fund ran out in January of 2013. No fund for export promotion exists currently. Although it may be the area to be covered by MICA, it is recommended to launch the export promotion fund at an early date.
- (e) Some of the development issues can be solved with financial support only (i.e. no technical support is required). In this case, the Promotion Plan assumes that financial support for exporters and processors is to be implemented by donors’ funds and/or government budget. It is recommended that DGPER requests donors to incorporate the financial supports into their projects.

11.1.2 Strawberry

- (a) The promotion plan for strawberry consists of two programs as prospecting new markets and preservation and expansion of cultivation. The program of prospecting new markets has two projects such as strengthening marketing capacities for sub-regional markets and commercialization with added value by producers to the domestic market. The program of preservation and expansion of cultivation has 3 projects such as selection of the adaptable varieties, introduction of the forcing culture and strengthening the secondly production area. The promotion plan aims at prospecting the sub-regional and domestic markets through preservation and expansion of strawberry cultivation. To reach the objective, the two projects, “project for strengthening marketing capacities for sub-regional markets” and “project for selection of the adaptable varieties”, are selected as priority projects out of the five projects. It is better to implement these projects simultaneously.
- (b) Although strawberries are a speciality product in Burkina Faso, the information of strawberry

cultivation is not gathered. INERA and MARHASA need to collect the information of varieties and cultivation techniques. To keep strawberries as a speciality product in Burkina Faso, it is also necessary to give the technical advice to the producers.

- (c) It is better that INERA propagates the runner plants of adapted varieties for renewal. It is expected that the producers can regularly renew the runner plants procured in Burkina Faso. It is difficult for producers to import new varieties from Europe by themselves. The producers need to be supported in the procurement procedure and finance.
- (d) It is difficult for producers or exporters to develop new market for export. DGPER needs to collect the information of targeted markets in regularly from diplomatic establishments abroad and CCI-BF and provide it.
- (e) Burkinabe strawberries need to be promoted at international exhibitions for prospecting markets of sub-regional countries. However, the participation cost of international exhibitions is too expensive for producers and exporters. MARHASA needs to have a support system for promotion activities of producers and exporters as grant.
- (f) As a part of diversification of market oriented agricultural products, DGPER needs to promote the fresh vegetables to prospect niche markets based on the experience of strawberry promotion activities.

11.1.3 Onion

- (a) Implementation of the “Project for extension of the rainy season onion cultivation” as soon as possible is recommended as the priority project. Although establishment of the onion storehouses is supported continuously by several organizations, assistance for the rainy season onion cultivation by donors were completed several years ago. Extension of the rainy season onion cultivation is possible by using existing information. It is important to start the extension activities as soon as possible since the producers can get benefit from the extension activities.
- (b) In recent years, import quantity of onions from the outside of sub-region to Burkina Faso and the sub-region are increasing. In addition, it will increase more with increase of the population and the income. Therefore, the selling quantity of domestic onions in the off-season should be increased with implementation of this plan and promotion of the onion sector as soon as possible. And Burkina Faso should get ahead of other export countries of onions in the sub-region in the off-season market
- (c) The seed supply companies have basic information about the cultivation of rainy season onions and experience of instruction of the cultivation techniques to producers. It is effective to use the seed supply companies for improvement and extension of the cultivation techniques of the rainy season onions.
- (d) Since the support for establishment of storehouses needs large budget, the budget should be carefully prepared. In addition to the government budget, 2KR counterpart fund, financial support of donors, etc. should be considered for the budget.
- (e) Regarding the techniques of cultivation and storage, recommended techniques at present should be extended while the research and development are continued. Examples of the techniques of cultivation to be researched are suitable varieties for diversification of cropping season and set planting. Reduction of establishment cost of the storehouses is one of the research issues.
- (f) The promotion of the onion sector should be implemented with considering from research and development, production, distribution to sales as one body. Therefore, the concerned organizations are many such as DGPER, DGPV, DRARHASA, INERA, etc. It is important that

all organizations should cooperate with each other in the implementation. And DGPER should coordinate the organizations in the stakeholders meeting.

- (g) Although this promotion plan is for promotion of onions, it can be referred for other agricultural products targeting domestic or sub-regional market. As well as onions, promotion plans for other agricultural products should be formulated with analysis of promotion issues and measures through value chain analysis.
- (h) The target area of this promotion plan includes the northern part of Burkina Faso where the precipitation is low and there are many producers, who are relatively poor.

11.1.4 Soybean

- (a) Since responding to growing soybean demand for feed materials in the domestic market is an urgent issue, it is recommended that “Project for Increase of Supply Volume in the Domestic Market” is early implemented as a priority project. This project consists of early stage for 2 years and latter stage for 3 years. The early stage should be implemented early.
- (b) Since soybeans are the new agriculture crop, except for production, reliable data on sales, processing and export/ important in the country as well as data on production, distribution and trade in the sub-regional countries are not sufficient. Also, there are no data on actual users, for example number of feeding chicken (broilers and layers) and poultry farmers, consumption feed, import data on broiler meat, eggs, chicks and import volume of feed. Therefore, in order to promote soybean filière for the future, it is necessary to collect such basic statistical data and share them with stakeholders.
- (c) From view point of long term perspective, in order to increase production of good quality soybeans, it is indispensable to increase yield per ha (productivity) and to conduct technical development for quality improvement and extension. Also, suitable varieties should be introduced from neighboring countries in response to various needs for production farmers and actual users. Therefore, trial cultivation of Nigerian varieties by INERA should be continued and selected varieties should be extended.
- (d) Further, as soybeans are the new agriculture crop which production has been rapidly increased, standards and regulations have not been created yet by the government of Burkina Faso. For insistence, soybean quality standards for sales and quality standards for soybean feeding materials and roast soybeans have not been established yet. Therefore, it is urgently necessary to set forward establishment of such standards and regulations for distribution and processing.
- (e) The lack of working capital is a problem for producers’ organizations and distribution/ processing industries. Since demand for the soybeans is high, it is surely to obtain cash by easily selling to buyers. However, they have problem not to prepare capital (cash) enough to buy agriculture inputs and soybeans. Therefore, it should be examined that application of “Warrantag” (warehouse financing) for soybeans which has been conducted for cow-pea.
- (f) With respect to poultry industries, which is one of soybean related industries, if price of soybeans is continued to be high in Burkina Faso due to short supply of soybeans, prices of chicken meats and eggs in Burkina Faso may increase. This might be resulted in importing chicken meats and eggs from America and Brazil. Or there might be higher possibility to import soybean cakes from sub-regional country markets and international market. Therefore, it should facilitate urgently to promote two value chains for feed processing and food processing in the country and also it is necessary to set forward collaboration and cooperation of soybean filière stakeholders in order to support for such promotion.
- (g) Upon this, it is important that MARHASA supports the development and promotion of soybean

related industries in collaboration and cooperation with Ministry of Animal Resources, MICA, etc. which are supporting soybean filière.

11.2 Recommendations on General Remarks

In Burkina Faso, import, mainly industrial products and food, is still increasing with increase of population. On the other hand, the major export products of Burkina Faso are gold and cotton and these two accounts for about 90% of export. Although the export value of gold has quickly increased since 2007, Burkina Faso still has had deficit of the trade balance.

In recent years, export values of agricultural products such as sesame and cashew nuts are increasing. It means that changes for diversification of export products and increase of export value have started. However, proportion of trading agricultural products in Burkina's agricultural products is still low in both of export and domestic market. In case of Burkina Faso where agriculture is still a major industry, there is some possibility to realize economic growth and improvement of trade balance by promoting distribution of agricultural products to the international, sub-regional and domestic markets. In order to promote distribution of agricultural products to domestic and foreign markets, it is essential to activate activities of private sector while role of the Government is to develop the stable environment by developing laws and systems.

(1) Consideration on Actors in Value Chains

Various activities should be done to increase export of agricultural products and strengthen competitive of domestic agricultural products against imported agricultural products. Although it is good to improve productivity through strengthening production stage, it is difficult to sell them without meeting needs of markets (buyers and consumers) and considering distribution. It is necessary to form value chains through strengthening actors in the process from producers to buyers with meeting the needs. In the promotion plans, systems to strengthening actors in value chains of each agricultural product are proposed by using experiences of the pilot activities.

- a) Through the Project, it was verified that rainy season onions can be cultivated by simple improvement of cultivation techniques of dry season onions, market channels of dry season onions can be used for the rainy season onions and sales price of the rainy season onions are almost same as that of imported onions. These have significance. Based on this experience, it is expected that production of the rainy season onions increase, they replace the imported onions and they are exported the sub-regional market by implementing same activities as the pilot activity in other areas.
- b) Although the strawberry is one of specialties of Burkina Faso, prospecting new markets is an issue. In the Project, entering supermarkets in Abidjan, which are big cities in the sub-region, was realized in collaboration between producers and exporters. Abidjan and Accra are remarkably developing markets and also needs of supermarkets for agricultural products are various and not only the strawberry but also fresh vegetables (tomato, lettuce, haricot, cabbage, onion, etc.) Supermarkets in Burkina Faso also have such needs. Therefore, not only expansion of the strawberry export but also trades of the fresh vegetables in domestic and foreign markets are expected.
- c) In the Project, trades with Japanese import companies were realized as a trial of expansion of sales outlets of dry mango through interview of requirements with Japanese buyers, improvement of production techniques in Burkina Faso and production of required products. It is expected that this experience is used for not only sales of value added dry mango but also finding high-end markets for niche products in the international market.

In the above 3 activities, mainly producers in the onion value chain, producers and exporters in the strawberry value chain and processors in the dry mango value chain were strengthened. Actors to be

strengthened in value chains depend on agricultural products and situation of value chain formulation. Especially, producers have constraints on market information, technical information and access to funds. It is important to consider situations of actors well for development of value chains.

(2) Consideration on Point of View of Industrial Development

Since soybeans can be variously used such as feed, processing/nutrient food, oil etc., various value chains regarding soybeans are formulated. Therefore, soybeans can contribute to promotion of the related industries such as feed processing, livestock, oil refining, small scale processing by women, etc. Soybean value chain development should be promoted by the Government with positioning the soybean as a strategic crop of industrial development.

In the Project, it was understood through value chain analysis from production to consumption that the soybeans were a promising crop which had effect of industrial promotion by related actors and created new values by leading other industries. Although the soybean is a new crop in Burkina Faso, they have various small value chains in the domestic market. The major value chains are for livestock feeds (feed processing and livestock) and for processed foods (infant foods and tofu related processed foods). It is expected that development support for these domestic value chains, 1) value chain for livestock feed and 2) value chain for small scale food processing on the basis of the point of view of female entrepreneurs and female companies support, leads promotion of rural economy and industrial development.

Material supply type products are included in the exported agricultural products. Although export quantities of these products are large, most of the value is added in the import countries since the products do not have processes to add value such as processing in Burkina Faso. In promotion of agricultural products, it is important to consider the point of view of domestic industrial development as well as the trade values.

(3) Consideration on the Sub-regional Market Where Economic Growth is Expected

In the sub-regional countries including Burkina Faso (ECOWAS), it is expected that markets of agricultural products and value added foods will grow well in future with population increase, urbanization, increase of the middle class and improvement of income. However, there are several types of countries at present. Consumption structure starts changing with economic growth in some countries. On the other hand, import structure is still same as before, cereals are major import products, in some countries. Although tariff is exempted among the ECOWAS countries in principle, the consumption structures in each country should be considered well.

(4) Consideration on Niche Market

To date, cotton export has contributed to economic growth in Burkina Faso. Diversification of agricultural products following the cotton is essential for further economic growth of Burkina Faso. In recent year, it may be difficult that bulk type agricultural products for export such as cotton will appear in future although export quantity of sesame is increasing. Under such situation, consumption structures start changing in matured markets and raising country markets in the international market and in the sub-regional market. Formulation of various niche markets has been started in such markets. It is important to find many various niche markets in future.

(5) Promotion of Market Oriented Agriculture

In the Project, “market oriented agriculture” was applied as a development approach. The approach is that agricultural products and processed products that meet needs of target markets are produced and sold since agriculture is business. Continuous support is important that small scale producers can practice the market oriented agriculture in value chains since the small scale producers support the Burkina’s agriculture.

In addition, many donors and NGOs have supported market oriented type projects although MARHASA was an implementation organization of this Project. A committee crosscutting the Government should be established to promote the “market oriented agriculture” well in balance while MARHASA manages the committee.

(6) Issues on Implementation of This Project

To implement this project, a taskforce team was established in DGPER and study and planning were conducted. However, procedures to obtain cooperation from other general directorates and regional directorates took long time although the cooperation was indispensable for this Project since the Project covered whole filière.

In addition, there were many opportunities that participation of other staffs, who were staffs of MARHASA but not member the taskforce team, in the taskforce meetings was better. However, the participation was not realized.

For example, data of soybeans regarding distribution, processing and sales in Burkina Faso, import and export are not prepared.

ATTACHMENT

1. Breakdown of Project Cost of Promotion Plan A-1
2. Minutes of Meetings of the Joint Coordination Committee A-8

1. Breakdown of Project Cost of Promotion Plan
Promotion Plan for Mango: Breakdown of Project Cost

(1) Fresh Mango

1) Project-type support (Technical and financial support)

Project	Activities	Items	Unit cost	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount		
Project for Acceleration of APEMAB & Activities to Gather Export Marketing Information	1 Preparing a long list of target countries Collecting information for export marketing	Member meeting (10 exporters, 2 times)	5,000 FCFA/person-time	20 person-time	100,000									100,000	
		Travel allowance	25,000 FCFA/person-day	10 person-day	250,000										250,000
		Operating expenses of APEMAB	100,000 FCFA/lot	1 lot	100,000										100,000
	2 Preparing a short list	Member meeting (10 exporters, 2 times)	5,000 FCFA/person-time	20 person-time	100,000										100,000
		Travel allowance	25,000 FCFA/person-day	10 person-day	250,000										250,000
		Operating expenses of APEMAB	100,000 FCFA/lot	1 lot	100,000										100,000
	3 Collecting phytosanitary information	Travelling costs to long-listed countries (Persian Gulf countries)	2,500,000 FCFA/person	2 person	5,000,000										5,000,000
	4 Determining the target countries	Member meeting (10 exporters, 2 times)	5,000 FCFA/person-time	20 person-time	100,000										100,000
		Travel allowance	25,000 FCFA/person-day	10 person-day	250,000										250,000
	Subtotal					6,250,000									6,250,000
	Project for Acceleration of Export Promotion by APEMAB through Establishment of Contribution System on Fresh Mango Exports	1 Establishing a task-group to study the possibility Studying by a task-group * 2 months	Member meeting (10 exporters, 2 times)	5,000 FCFA/person-time			20 person-time	100,000							100,000
			Travel allowance	25,000 FCFA/person-day			10 person-day	250,000							250,000
Operating expenses of APEMAB			100,000 FCFA/lot			2 lot	200,000							200,000	
Member meeting (10 exporters, 4 times)			5,000 FCFA/person-time			40 person-time	200,000								200,000
Fee for external experts (2 persons, 4 times)			100,000 FCFA/person-day			8 person-day	800,000								800,000
Travel allowance			25,000 FCFA/person-day			16 person-day	400,000								400,000
Operating expenses of APEMAB			100,000 FCFA/month			2 month	200,000								200,000
Making of report			* To be conducted by task-group				0								0
Printing of report			5,000 FCFA/copy			50 copy	250,000								250,000
2 Installing a committee for system designing and a secretariat office			Office furniture/equipment, etc.	1,500,000 FCFA/lot			1 lot	1,500,000							1,500,000
		Operating expenses of APEMAB	100,000 FCFA/month			2 month	200,000							200,000	
3 Designing a collection system by the committee		Salary for secretariat staff (1 person) ^(*)	750,000 FCFA/month			6 month	4,500,000	9 month	6,750,000					11,250,000	
4 Reporting and discussing with the members		Fee for consultant (1 person, 15 days/month)	1,500,000 x 50% FCFA/month			6 month	4,500,000	9 month	6,750,000					11,250,000	
5 Preparing for the operation * 15 months		Fee for external expert (1 person, 1 time/month)	100,000 FCFA/person-day			6 person-day	600,000	9 person-day	900,000					1,500,000	
		Operating expenses of the committee	100,000 FCFA/month			6 month	600,000	9 month	900,000					1,500,000	
		Meeting (10 persons, 1 time/month)	5,000 FCFA/person-time			60 person-time	300,000	90 person-time	450,000					750,000	
		Travel allowance	25,000 FCFA/person-day			24 person-day	600,000	36 person-day	900,000					1,500,000	
		Paper forms (slip, ledger sheet, etc.), Office equipment	1,500,000 FCFA/lot					1 lot	1,500,000					1,500,000	
6 Starting the operation		Salary for secretariat staff (1 person) ^(*)	750,000 FCFA/month							3 month	2,250,000			2,250,000	
7 Monitoring, reviewing and improving the system * Monitoring period : 3 months (Apr. - Jun.)		Fee for certified accountant (1 person)	1,500,000 FCFA/month							3 x 50% month	2,250,000			2,250,000	
		Fee for external expert (1 person, 1 time/month)	100,000 FCFA/person-day							3 person-day	300,000			300,000	
		Operating expenses of the committee	100,000 FCFA/month							3 month	300,000			300,000	
		Meeting (10 persons, 1 time/month)	5,000 FCFA/person-time							120 person-time	600,000			600,000	
		Travel allowance	25,000 FCFA/person-day							48 person-day	1,200,000			1,200,000	
Subtotal							15,200,000		18,150,000		6,900,000		40,250,000		
Total					6,250,000		15,200,000		18,150,000		6,900,000		46,500,000		

(*1) Salary for secretariat staff is to be paid by donor during the period from 3. Designing a collection system to 7. Monitoring and reviewing.
 Payment of travel allowance for meeting is limited to a participant who requires an overnight stay. Meetings is to be held at Bobo-Dioulasso.

2) Subsidy assistance (Financial support)

Domain, Intended Activities	Target Actor	Amount per case (FCFA) ^(*)	Number of cases	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
				Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount			
Acceleration of sales promotion by exporters														
Taking part in trade fairs/exhibitions in the target countries, Preparing sales promotion tools	Exporters	1,500,000	25	0	0	7	10,500,000	6	9,000,000	6	9,000,000	6	9,000,000	37,500,000
Inviting buyers from the target countries	Exporters	1,000,000	5	0	0	2	2,000,000	2	2,000,000	1	1,000,000	0	0	5,000,000
Increase of production area by small-medium producers														
Organizing new producers into groups and training them on orchard management	Exporters	1,250,000	5	2	2,500,000	3	3,750,000	0	0	0	0	0	0	6,250,000
Introducing Global GAP newly	Exporters	1,250,000	5	2	2,500,000	3	3,750,000	0	0	0	0	0	0	6,250,000
Installation of small-scale conditioning facility for air mangoes														
Installing small-scale conditioning facility for air mangoes	Exporter who have started exportation to the target countries	15,000,000	5	0	0	1	15,000,000	2	30,000,000	2	30,000,000	0	0	75,000,000
Total					5,000,000		35,000,000		41,000,000		40,000,000		9,000,000	130,000,000

(*1) 50% is assumed for subsidy rate. No costs of fund procurement and fund operation are included.

(2) Dried Mango

1) Project-type support (Technical and financial support)

Project	Activities	Items	Unit cost	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount		
Project for Improvement of Hygiene to Meet the EU Regulation on the Hygiene of Foodstuffs	1	Explanation of the project and selection of candidate facilities													
	1)	Preparing a long list of candidate facilities	Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000								50,000	
	2)	Explaining about the project	Explanatory meetings	5,000 FCFA/person-time	50 person-time	250,000								250,000	
			Travel allowance	25,000 FCFA/person-day	15 person-day	375,000								375,000	
			Printing of explanatory papers	1,000 FCFA/copy	50	50,000								50,000	
	3)	Surveying the candidate facilities	Travel allowance for surveyors (3 persons, 2 weeks)	25,000 FCFA/person-day	42 person-day	1,050,000								1,050,000	
			Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000								50,000	
	2	To let the processors understand the requirements of the EU regulation													
	1)	Seminar on the EU regulation	Making of teaching materials / handouts	* To be conducted by expert/project office		0									0
	2)	Observation of advanced processing facility ^(*)	Seminar (25persons, 2 times)	5,000 FCFA/person-time	50 person-time	250,000									250,000
			Travel allowance	25,000 FCFA/person-day	10 person-day	250,000									250,000
			Printing of teaching materials / handouts	3,000 FCFA/copy	70 copy	210,000									210,000
			Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000									50,000
	3	Improving the processing facility/equipment													
	1)	Explaining the support scheme, Selection of target facilities	Explanatory meeting	5,000 FCFA/person-time	30 person-time	150,000									150,000
			Travel allowance	25,000 FCFA/person-day	5 person-day	125,000									125,000
	2)	Preparing the whole implementation plan, Notification and building the agreement	Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000									50,000
	3)	Preparing cost estimation materials and renovation plans		* To be conducted by expert/project office		0									0
	4)	Implementing the renovation	Construction materials, Wage for workers, etc.	2,000,000 FCFA/facility	8 facility	16,000,000	9 facility	18,000,000	8 facility	16,000,000					50,000,000
	5)	Monitoring in the processing season		* To be conducted by expert/project office		0		0		0					0
	6)	Implementation of additional works	Cost for additional renovation	100,000 FCFA/facility	8 facility	800,000	9 facility	900,000	8 facility	800,000					2,500,000
	4	Enhancing the preventive measures against contamination risks in the operation													
	1)	Training on preventive measures against contamination risks ^(*)	Training	0		0									0
	2)	Implementation of preventive measures	Samples of working clothes	20,000 FCFA/copy	45 copy	900,000									900,000
	3)	Monitoring and on-site instruction		* To be conducted by expert/project office		0									0
	5	Improving the management system of hygiene control													
	1)	Organizing the working group for improvement of hygiene management	Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000									50,000
	2)	Preparing the program for training and on-site instruction	Allowance for working group members (5 person x 3 days)	25,000 FCFA/person-day	15 person-day	375,000									375,000
	3)	Preparing teaching materials and handout for the training	Allowance for working group members (5 person x 10 days)	25,000 FCFA/person-day	50 person-day	1,250,000									1,250,000
	4)	Preparing teaching materials for worker education	Allowance for working group members (5 person x 4 days)	25,000 FCFA/person-day	20 person-day	500,000									500,000
	5)	Printing of teaching materials	Printing of teaching materials	6,000 FCFA/copy	70 copy	420,000									420,000
	6)	Implementing the training	Training (25 persons, 2 times)	5,000 FCFA/person-time	50 person-time	250,000									250,000
			Travel allowance	25,000 FCFA/person-day	10 person-day	250,000									250,000
	7)	Development of Standard operation procedure		* To be conducted by beneficiaries		0									0
	8)	Education of workers		* To be conducted by beneficiaries		0									0
	9)	Conducting the Risk management based on the HACCP principles		* To be conducted by beneficiaries		0									0
	10)	On-site instruction / consultation		* To be conducted by expert/project office		0									0
	6	Common costs													
	1)	Hiring of local engineer/consultant	HACCP consultant (1 person)	3,000,000 FCFA/month	6 month	18,000,000	3 month	9,000,000	3 month	9,000,000					36,000,000
			Building engineer (1 person, live in Bobo-Dioulasso)	1,000,000 FCFA/month	6 month	6,000,000	12 month	12,000,000	12 month	12,000,000					30,000,000
			Building engineer assistant (2 persons, 9 months/year)	750,000 FCFA/month	18 month	13,500,000	18 month	13,500,000	18 month	13,500,000					40,500,000
	2)	Hiring of foreign expert	Food hygiene control (1 person)	10,000,000 FCFA/month	8 month	80,000,000	4 month	40,000,000	4 month	40,000,000					160,000,000
3)	Progress report meeting	Refreshments	5,000 FCFA/person-time	30 person-time	150,000	30 person-time	150,000	30 person-time	150,000					450,000	
	* 1 time/year, 15 persons, at Ouaga	Travel allowance	25,000 FCFA/person-day	30 person-day	750,000	30 person-day	750,000	30 person-day	750,000					2,250,000	
		Printing of meeting papers	1,000 FCFA/copy	30 copy	30,000	30 copy	30,000	30 copy	30,000					90,000	
	Subtotal				142,135,000		94,330,000		92,230,000		0		0	328,695,000	
Project for Development and Dissemination of Technology for ATETSA Dryer Modification	1	Collecting the user evaluation on the modification technology tested in the pilot activity	Operating expenses of PTRAMAB	50,000 FCFA/lot	1 lot	50,000								50,000	
			Meeting	5,000 FCFA/person-time	30 person-time	150,000								150,000	
			Travel allowance	25,000 FCFA/person-day	5 person-day	125,000								125,000	
	2	Testing another way of modification by use of locally available cheap exhaust fan * Modify 2 dryers (1 dryer x 2 facilities)	Materials and labor	1,000,000 FCFA/unit	2 unit	2,000,000									2,000,000
			Mangoes, gas, labor	40,000 FCFA/time-unit	6 time-unit	240,000									240,000
	3	Exploring the sources of equipment/materials		* To be conducted by expert/project office		0									0
	4	Determination of the technology to be disseminated	Meeting	5,000 FCFA/person-time	20 person-time	100,000									100,000
			Travel allowance	25,000 FCFA/person-day	5 person-day	125,000									125,000
			Printing of meeting papers	2,000 FCFA/copy	60 copy	120,000									120,000
	5	Determination of the quantity of equipment	Operating expenses of PTRAMAB	100,000 FCFA/lot	1 lot	100,000									100,000
	6	Importation of the equipment ^(*) * Duty free importation * Total number of containers: Equipment for 35 dryers/20ft container =>11 containers	Thermometer for 380 dryers (380x2x2)	9,300 FCFA/unit	1,520 unit	14,136,000									14,136,000
			Fan for 300 dryers (300x2)	56,000 FCFA/unit	600 unit	33,600,000									33,600,000
			Plastic tray for 200 dryers (200x20x2)	10,000 FCFA/pc	8,000 pc	80,000,000									80,000,000
			Ocean & inland transportation	2,370,000 FCFA/container	11 container	26,070,000									26,070,000
			Handling, custom clearance at loading port (Japan)	3,650,000 FCFA/lot	1 lot	3,650,000									3,650,000
			Custom clearance, handling at Bobo-Dioulasso	650,000 FCFA/container	11 container	7,150,000									7,150,000
			Exporter's commission (in Japan)	10,000,000 FCFA/lot	1 lot	10,000,000									10,000,000
			Warehouse fee (in Japan)	1,500,000 FCFA/lot	1 lot	1,500,000									1,500,000
			Equipment costs to be covered by the beneficiaries	10% of Equipment costs	1 lot	-12,774,000									-12,774,000
	7	Training on how to make modification, Distribution of the equipment	Training (25 persons., 2 times)	5,000 FCFA/person-time			50 person-time	250,000							250,000
			Travel allowance	25,000 FCFA/person-day			10 person-day	250,000							250,000
			Printing of training materials	3,000 FCFA/copy			70 copy	210,000							210,000
	8	Modification of ATETSA dryers		* To be conducted by beneficiaries		0									0
9	Monitoring		* To be conducted by project office		0									0	
10	Common costs														
1)	Hiring of foreign expert	Modification of dryer (1 person)	10,000,000 FCFA/month	3 month	30,000,000									30,000,000	
2)	Hiring of local skilled worker	Electrician, Carpenter	750,000 FCFA/month	2 month	1,500,000									1,500,000	
3)	Progress report meeting	Refreshments	5,000 FCFA/person-time	30 person-time	150,000	30 person-time	150,000							300,000	
	* 1 time/year, 15 persons, at Ouaga	Travel allowance	25,000 FCFA/person-day	30 person-day	750,000	30 person-day	750,000							1,500,000	
		Printing of meeting papers	1,000 FCFA/copy	30 copy	30,000	30 copy	30,000							60,000	
	Subtotal				198,772,000		1,640,000		0		0		0	200,412,000	

Project	Activities	Items	Unit cost	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount		
Project for Introduction of Smaller Size Dryers	1 Selection of small-size dryer meeting the requirements														
	1) Exploring the sources of dryers		* To be conducted by expert/project office			0	0							0	
	2) Setting up a working group for testing and introducing new dryers	Operating expenses of PTRAMAB	50,000 FCFA/lot			1 lot	50,000							0	
	3) Determination of dryers for testing	Meeting (10 persons, 2 times)	5,000 FCFA/person-time			20 person-time	100,000								0
		Travel allowance	25,000 FCFA/person-day			6 person-day	150,000								0
		Printing of meeting papers	2,000 FCFA/copy			30 copy	60,000								0
	4) Importation of dryers for testing	Cost for dryer, transportation and import custom	5,000,000 FCFA/unit			2 unit	10,000,000								0
		Materials and labor	250,000 FCFA/unit			2 unit	500,000								0
	5) Installing the dryers and conducting test	Mangoes, gas, labor	40,000 FCFA/time-unit			6 time-unit	240,000								0
		Meeting (refreshment) at the testing	5,000 FCFA/person-time			20 person-time	100,000								0
		Travel allowance to attend the testing	25,000 FCFA/person-day			6 person-day	150,000								0
	2 Introduction of the selected dryer														
	1) Selection of the beneficiaries	Operating expenses of PTRAMAB	50,000 FCFA/lot			1 lot	50,000								0
		Explanatory meeting	3,000 FCFA/person-time			50 person-time	150,000								0
		Distribution/receipt of applications	50,000 FCFA/lot			1 lot	50,000								0
	2) Importation of the dryers * Duty free importation	Dryer 30units	2,500,000 FCFA/unit					10 unit	25,000,000		10 unit	25,000,000			75,000,000
		Ocean & inland transportation: 10 unit (2	2,000,000 FCFA/container					2 container	4,000,000		2 container	4,000,000		2 container	4,000,000
		Handling, custom clearance at loading port	350,000 FCFA/container					2 container	700,000		2 container	700,000		2 container	700,000
		Custom clearance, handling at Bobo-Dioulasso	750,000 FCFA/container					2 container	1,500,000		2 container	1,500,000		2 container	1,500,000
	3) Preparing for installation, and installation		* To be conducted by beneficiaries					0			0			0	
	4) Operation of the dryers		* To be conducted by beneficiaries					0			0			0	
	5) Monitoring		* To be conducted by project office					0			0			0	
	3 Common costs														
	1) Hiring of foreign expert	Purchase of machinery (1 person)	10,000,000 FCFA/month			2 month	20,000,000	1 month	10,000,000						30,000,000
		Hiring of local skilled worker	750,000 FCFA/month			2 month	1,500,000	1 month	750,000						2,250,000
		Refreshments	5,000 FCFA/person-time			15 person-time	75,000	15 person-time	75,000		15 person-time	75,000		15 person-time	300,000
		Travel allowance	25,000 FCFA/person-day			15 person-day	375,000	15 person-day	375,000		15 person-day	375,000		15 person-day	1,500,000
	3) Progress report meeting * 1 time/year, 15 persons, at Ouaga	Printing of meeting papers	1,000 FCFA/copy			15 copy	15,000	15 copy	15,000		15 copy	15,000		15 copy	60,000
	Subtotal					0	33,565,000		42,415,000		31,665,000		31,665,000	139,310,000	
			Total			340,907,000		129,535,000		134,645,000		31,665,000	31,665,000	668,417,000	

- (*1) Advanced processing facility in Bobo-Dioulasso is to be visited in a single-day. Transportation fee is to be covered by the participants.
(*2) Training on preventive measures against contamination risks is to be concurrently-conducted with the Seminar on the EU regulation.
(*3) Europe-made equipment is to be explored in the project. The costs data of Japan-made equipment that were obtained in the pilot project is used for the cost estimation.
Payment of travel allowance for meeting is limited to a participant who requires an overnight stay. Meetings is to be held at Bobo-Dioulasso.

2) Subsidy assistance (Financial support)

Domain, Intended Activities	Target Actor	Amount per case (FCFA)*1	Number of cases	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
				Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	
Support to attain the HACCP certification														
Obtaining the HACCP certification	Processors who fulfill the EU regulation on the hygiene of foodstuffs	1,500,000	5	1	1,500,000	1	1,500,000	1	1,500,000	1	1,500,000	1	1,500,000	7,500,000
Support to utilize the waste														
Development of processed food products by use of pulp	Processors who get a foreign partner /NGO support	2,500,000	3	0	0	1	2,500,000	1	2,500,000	1	2,500,000	0	0	7,500,000
Making of biogas facility	Processors who receive the SNV training on biogas	750,000	20	4	3,000,000	4	3,000,000	4	3,000,000	4	3,000,000	4	3,000,000	15,000,000
Enhance the procurement of material mangoes														
Organizing new producers into groups and obtaining the	Exporters	1,250,000	8	4	5,000,000	2	2,500,000	2	2,500,000	0	0	0	0	10,000,000
Introduction of South African dryers														
Introduction of South African dryers	Processors whose current annual production is more than 15 tons, who can prepare the place and install dryer with his/her own resources.	12,500,000	5	1	12,500,000	1	12,500,000	1	12,500,000	1	12,500,000	1	12,500,000	62,500,000
Acceleration of sales promotion by exporters														
Taking part in overseas trade fairs/exhibitions,	Exporters	1,500,000	20	4	6,000,000	4	6,000,000	4	6,000,000	4	6,000,000	4	6,000,000	30,000,000
Inviting overseas buyers	Exporters	1,000,000	10	2	2,000,000	2	2,000,000	2	2,000,000	2	2,000,000	2	2,000,000	10,000,000
			Total		30,000,000		30,000,000		30,000,000		27,500,000		25,000,000	142,500,000

(*1) 50% is assumed for subsidy rate. No costs of fund procurement and fund operation are included.

Notes on the estimated costs of Project-type support (common to fresh and dried mango):

- The project-type support are envisioned to be implemented as donor's aid project. Manner of project operation varies depending on donors. Therefore, manpower costs of project staff, vehicle costs and office expenses are not estimated.
- No manpower costs of Burkinabe officials are included.
- Unit cost of foreign expert does not include the airfare from home country.

Promotion Plan for Strawberry: Breakdown of Project Cost

Project	Activity	Item	Unit Price	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
Strengthen Marketing Capacities for Sub-regional Market	1. Understanding the production and consummation of strawberry	Veune	500,000 FCFA /day	1 day	500,000	1 day	500,000							1,000,000
		Allowance of participants	15,000 FCFA /person·day	15 person·day	225,000	15 person·day	225,000							450,000
		Trnsportation	100 FCFA /person·day	2,200 km	220,000	2,200 km	220,000							440,000
		Allowance of trainers	5,000 FCFA /person·day	15 person·day	75,000	15 person·day	75,000							150,000
	2. Identification of market needs (Survey)	Air ticket (Accra)	400,000 FCFA /person	5 person	2,000,000	5 person	2,000,000							4,000,000
		Air ticket (Abidjan)	400,000 FCFA /person	5 person	2,000,000	5 person	2,000,000							4,000,000
		Allowance(Overseas survey	55,000 FCFA /person·day	40 person·day	2,200,000	40 person·day	2,200,000							4,400,000
		Orverseas survey	550,000 FCFA /time	2 time	1,100,000	2 time	1,100,000							2,200,000
		Venue	200,000 FCFA /day	1 day	200,000	1 day	200,000							400,000
		Allowance of participants	15,000 FCFA /person·day	10 person·day	150,000	10 person·day	150,000							300,000
		Transportation	100 FCFA /km	1,250 km	125,000	1,250 km	125,000							250,000
		Allowance of trainers	5,000 FCFA /person·day	10 person·day	50,000	10 person·day	50,000							100,000
	3. Establishment the marketing strategy	Venue	500,000 FCFA /day	2 day	1,000,000	2 day	1,000,000							2,000,000
		Allowance of trainers	5,000 FCFA /person·day	30 person·day	150,000	30 person·day	150,000							300,000
		Allowance of participants	15,000 FCFA /person·day	30 person·day	450,000	30 person·day	450,000							900,000
		Transportation	100 FCFA /km	1,000 km	100,000	1,000 km	100,000							200,000
	4. Improvement of processing, packaging, packing and transportation	Packing materials	500,000 FCFA set	1 set	500,000	1 set	500,000							1,000,000
		Sample product	350,000 FCFA set	1 set	350,000	1 set	350,000							700,000
		Packaging materials	300,000 FCFA set	1 set	300,000	1 set	300,000							600,000
		Carriage fee	400,000 FCFA set	1 set	400,000	1 set	400,000							800,000
Transportation		100 FCFA /km	1,500 km	150,000	1,500 km	150,000							300,000	
5. Monitoring and reporting	Transportation	100 FCFA /km	1,500 km	150,000	1,500 km	150,000							300,000	
	Miscellaneous	100,000 FCFA set	1 set	100,000	1 set	100,000							200,000	
Subtotal					12,495,000		12,495,000						24,990,000	
Commercialization with Added Value by Producers to the Domestic Market	1. Discussion with stakeholders	Venue	500,000 FCFA /day	2 day	1,000,000	2 day	1,000,000							2,000,000
		Allowance of participants	15,000 FCFA /person·day	20 person·day	300,000	60 person·day	900,000							1,200,000
		Transportation	100 FCFA /km	1,000 km	100,000	2,500 km	250,000							350,000
		Allowance of trainers	5,000 FCFA /person·day	20 person·day	100,000	60 person·day	300,000							400,000
	2. Activities for sales promotio	Transportation	100 FCFA /km	1,500 km	150,000	1,500 km	150,000							300,000
		Sample product	250,000 FCFA set	1 set	250,000	1 set	250,000							500,000
		Packaging materials	200,000 FCFA set	1 set	200,000	1 set	200,000							400,000
		Communication	100,000 FCFA set	1 set	100,000	1 set	100,000							200,000
	3. Monitoring and concluding	Transportation	100 FCFA km	1,000 km	100,000	1,500 km	150,000							250,000
		Miscellaneous	100,000 FCFA set	1 set	100,000	1 set	100,000							200,000
Subtotal					2,400,000		3,400,000						5,800,000	
Selection of the Adaptable Varieties	1. Collection of the characteristic of varieties to be introduced	Allowance	5,000 FCFA /person·day	4 person·day	20,000									20,000
		Transportation	100 FCFA /km	140 km	14,000									14,000
	2. Identification of adaptable characteristic	Communication	50,000 FCFA set	1 set	50,000									50,000
		Allowance	5,000 FCFA /person·day	10 person·day	50,000									50,000
		Transportation	100 FCFA /km	200 /km	20,000									20,000
	3. Implementation of cultivation test in the field	Strawberry Plant	300 FCFA /plant	10,000 plant	3,000,000	7,000 plant	2,100,000							5,100,000
		Fertilizer	100,000 FCFA /person	6 person	600,000	4 person	400,000	4 person	400,000	4 person	400,000			1,800,000
		Pesticide	50,000 FCFA /person	6 person	300,000	4 person	200,000	4 person	200,000	4 person	200,000			900,000
		Irrigation pump fuel	750 FCFA /ℓ	1,500 ℓ	1,125,000	1,000 ℓ	750,000	1,000 ℓ	750,000	1,000 ℓ	750,000			3,375,000
		Cultivation materials	20,000 FCFA /person	6 person	120,000	4 person	80,000	4 person	80,000	4 person	80,000			360,000
		Allowance	5,000 FCFA /person·day	15 person·day	75,000	50 person·day	250,000	50 person·day	250,000	50 person·day	250,000			825,000
		Transportation	100 FCFA /km	500 km	50,000	2,000 km	200,000	2,000 km	200,000	2,000 km	200,000			650,000
		Printing list	1,800 FCFA /copy									120 copy	216,000	216,000
	4. Official registration of varieties	Strawberry Plant	300 FCFA /plant			3,000 plant	900,000							900,000
		Fertilizer	100,000 FCFA set			1 set	100,000	1 set	100,000	1 set	100,000	1 set	100,000	400,000
		Pesticide	50,000 FCFA set			1 set	50,000	1 set	50,000	1 set	50,000	1 set	50,000	200,000
		Cultivation materials	50,000 FCFA set			1 set	50,000	1 set	50,000	1 set	50,000	1 set	50,000	200,000
		Allowance	5,000 FCFA /person·day			30 person·day	150,000	30 person·day	150,000	30 person·day	150,000	30 person·day	150,000	600,000
		Transportation	100 FCFA /km			1,200 km	120,000	1,200 km	120,000	1,200 km	120,000	1,200 km	120,000	480,000
		Irrigation pump fuel	750 FCFA /ℓ			650 ℓ	487,500	650 ℓ	487,500	650 ℓ	487,500	650 ℓ	487,500	1,950,000
Registration fee	250,000 FCFA set									1	250,000	250,000		
5. Establish technical guideline	Printing guide	2,200 FCFA /copy									500 copy	1,100,000	1,100,000	
	Miscellaneous	100,000 FCFA set									1 set	100,000	100,000	
Subtotal					5,424,000		5,837,500		2,837,500		2,837,500		2,623,500	19,560,000

Project	Activity	Item	Unit Price	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount		
Introduction of the Forcing Culture	1. Training for forcing culture of strawberry	Venue	200,000 FCFA /day	1 day	200,000	1 day	200,000							400,000	
		Allowance of participants	25,000 FCFA /person·day	10 person·day	250,000	10 person·day	250,000								500,000
		Transportation	100 FCFA /km	500 km	50,000	500 km	50,000								100,000
		Allowance of trainers	5,000 FCFA /day	10 person·day	50,000	10 person·day	50,000								100,000
	2. Selection of producers	Allowance	5,000 FCFA /person·day	4 person·day	20,000	4 person·day	20,000								40,000
		Transportation	100 FCFA /km	200 km	20,000	200 km	20,000								40,000
	3. Field test for technique of forcing culture	Fertilizer	300,000 FCFA set	1 set	300,000	1 set	300,000								600,000
		Pesticide	200,000 FCFA set	1 set	200,000	1 set	200,000								400,000
		Irrigation pump fuel	750 FCFA /ℓ	1,200 ℓ	900,000	1,200 ℓ	900,000								1,800,000
		Test maaterials	45,000 FCFA set	1 set	45,000	1 set	45,000								90,000
	4. Monitoring and instructing	Allowance	5,000 FCFA /person·day	30 person·day	150,000	30 person·day	150,000								300,000
		Transportation	100 FCFA /km	2,000 km	200,000	2,000 km	200,000								400,000
	5. Analyzing the result and concluding	Venue	500,000 FCFA /day			1 day	500,000								500,000
		Allowance of participants	25,000 FCFA /person·day			50 person·day	1,250,000								1,250,000
		Transportation	5,000 FCFA /person·day			50 person·day	250,000								250,000
		Allowance of trainers	5,000 FCFA /person·day			50 person·day	250,000								250,000
Miscellaneous		100,000 FCFA set			1 set	100,000								100,000	
Subtotal					2,385,000		4,735,000							7,120,000	
Strengthen the Secondly Production Area	1. Selection of target producers	Allowance	2,500 FCFA /person·day	4 person·day	10,000									10,000	
		Transportation	100 FCFA /km	1,000 km	100,000										100,000
	2. Selection and distribution of adapted varieties and cultivation materials	Strawberry Plant	300 FCFA /plant	10,000 plant	3,000,000										3,000,000
		Fertilizer	200,000 FCFA set	1 set	200,000	1 set	200,000								400,000
		Pesticide	100,000 FCFA set	1 set	100,000	1 set	100,000								200,000
		Cultivation materials	50,000 FCFA set	1 set	50,000	1 set	50,000								100,000
		Irrigation pump fuel	750 FCFA /ℓ	1,200 ℓ	900,000	1,200 ℓ	900,000								1,800,000
	3. Training for understanding the characteristic of strawberry market	Venue	500,000 FCFA /day	1 day	500,000										500,000
		Allowance of participants	15,000 FCFA /person·day	10 person·day	150,000										150,000
		Transportation	100 FCFA /km	1,000 km	100,000										100,000
		Allowance of trainers	5,000 FCFA /person·day	10 person·day	50,000										50,000
	4. Exchange of views with producers in Ouagadougou	Minibus rental	200,000 FCFA /car·day			3 car·day	600,000								600,000
		Fuel	700 FCFA /ℓ			1,000 ℓ	700,000								700,000
		Venue	500,000 FCFA /day			1 day	500,000								500,000
		Allowance of participants	25,000 FCFA /person·day			20 person·day	500,000								500,000
		Transportation	5,000 FCFA /person·day			20 person·day	100,000								100,000
5. Monitoring and reporting	Allowance of trainers	5,000 FCFA /person·day			50 person·day	250,000								250,000	
	Transportation	100 FCFA /km	1,200 km	120,000	3,000 km	300,000	3,000 km	300,000						720,000	
	Miscellaneous	50,000 FCFA set	1 set	50,000	1 set	50,000	1 set	50,000						150,000	
Subtotal					5,330,000		4,250,000		350,000					9,930,000	
Total					25,634,000		27,317,500		3,187,500		2,837,500		2,623,500	67,400,000	

Promotion Plan for Onion: Breakdown of Project Cost

Project	Activity	Item	Unit Price	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount		
Improvement of the Cultivation Techniques for the Rainy Season Onions	1. Considering suitable areas and selecting fields for the trial cultivation	Allowance	25,000 FCFA/person·day	18 person·day	450,000									450,000	
		Transportation	110 FCFA/km	2,000 km	220,000									220,000	
	2. Conducting the trial cultivation (0.5ha * 2 place * 3 region)	Seed	220,000 FCFA/ha			3 ha	660,000	3 ha	660,000	3 ha	660,000			1,980,000	
		Manure	280,000 FCFA/ha			3 ha	840,000	3 ha	840,000	3 ha	840,000			2,520,000	
		Agricultural chemicals	120,000 FCFA/ha			3 ha	360,000	3 ha	360,000	3 ha	360,000			1,080,000	
		Chemical fertilizers	317,000 FCFA/ha			3 ha	951,000	3 ha	951,000	3 ha	951,000			2,853,000	
		Fuel for pump	247,000 FCFA/ha			3 ha	741,000	3 ha	741,000	3 ha	741,000			2,223,000	
		Oil for pump	27,000 FCFA/ha			3 ha	81,000	3 ha	81,000	3 ha	81,000			243,000	
		Labour	90,000 FCFA/ha			3 ha	270,000	3 ha	270,000	3 ha	270,000			810,000	
		Allowance	25,000 FCFA/person·day			12 person·day	300,000	12 person·day	300,000	12 person·day	300,000			900,000	
	Transportation	110 FCFA/km			3,600 km	396,000	3,600 km	396,000	3,600 km	396,000			1,188,000		
	3. Considering possibility of sale	Allowance	25,000 FCFA/person·day			6 person·day	150,000	6 person·day	150,000	6 person·day	150,000			450,000	
		Transportation	110 FCFA/km			1,800 km	198,000	1,800 km	198,000	1,800 km	198,000			594,000	
	4. Establishing the cultivation guideline	Printing	100 FCFA/set						15,000 set	1,500,000				1,500,000	
Subtotal					670,000		4,947,000		4,947,000		6,447,000		0	17,011,000	
Extension of the Rainy Season Onion Cultivation	1. Conducting trainings for extension staffs	Venue	5,000 FCFA/person·day							252 person·day	1,260,000	504 person·day	2,520,000	3,780,000	
		Allowance of participants	25,000 FCFA/person·day							240 person·day	6,000,000	480 person·day	12,000,000	18,000,000	
		Transportation of participation	110 FCFA/km							48,000 km	5,280,000	96,000 km	10,560,000	15,840,000	
		Allowance of trainers	5,000 FCFA/person·day							12 person·day	60,000	12 person·day	60,000	120,000	
		Printing of textbooks	250 FCFA/person							120 person	30,000	240 person	60,000	90,000	
	2. Conducting demonstration cultivations (1ha/province)	Seed	220,000 FCFA/ha	18 ha	3,960,000	18 ha	3,960,000	18 ha	3,960,000	36 ha	7,920,000	18 ha	3,960,000	23,760,000	
		Manure	280,000 FCFA/ha	18 ha	5,040,000	18 ha	5,040,000	18 ha	5,040,000	36 ha	10,080,000	18 ha	5,040,000	30,240,000	
		Agricultural chemicals	120,000 FCFA/ha	18 ha	2,160,000	18 ha	2,160,000	18 ha	2,160,000	36 ha	4,320,000	18 ha	2,160,000	12,960,000	
		Chemical fertilizers	317,000 FCFA/ha	18 ha	5,706,000	18 ha	5,706,000	18 ha	5,706,000	36 ha	11,412,000	18 ha	5,706,000	34,236,000	
		Fuel for pump	247,000 FCFA/ha	18 ha	4,446,000	18 ha	4,446,000	18 ha	4,446,000	36 ha	8,892,000	18 ha	4,446,000	26,676,000	
		Oil for pump	27,000 FCFA/ha	18 ha	486,000	18 ha	486,000	18 ha	486,000	36 ha	972,000	18 ha	486,000	2,916,000	
		Labour	90,000 FCFA/ha	18 ha	1,620,000	18 ha	1,620,000	18 ha	1,620,000	36 ha	3,240,000	18 ha	1,620,000	9,720,000	
		Field day	2,500 FCFA/person	1,440 person	3,600,000	1,440 person	3,600,000	1,440 人	3,600,000	2,880 person	7,200,000	1,440 person	3,600,000	21,600,000	
		Instruction fee of private sector	50,000 FCFA/person·day	504 person·day	25,200,000	504 person·day	25,200,000	504 person·day	25,200,000					75,600,000	
	Allowance of extension staffs	5,000 FCFA/person·day							1,008 person·day	5,040,000	504 person·day	2,520,000	7,560,000		
	Transportation	110 FCFA/km	50,400 km	5,544,000	50,400 km	5,544,000	50,400 km	5,544,000	100,800 km	11,088,000	50,400 km	5,544,000	33,264,000		
	3. Technical support for producers	Instruction fee of private sector	50,000 FCFA/person·day			252 person·day	12,600,000	252 person·day	12,600,000					25,200,000	
		Transportation	110 FCFA/km			12,600 km	1,386,000	12,600 km	1,386,000	25,200 km	2,772,000	25,200 km	2,772,000	8,316,000	
	Subtotal					57,762,000		71,748,000		71,748,000		85,566,000		63,054,000	349,878,000
Support for Establishment of the Onion Storehouses	1. Confirming standard of the storehouse	Allowance	25,000 FCFA/person·day	24 person·day	600,000									600,000	
		Transportation	110 FCFA/km	2,000 km	220,000										220,000
	2. Selecting the beneficiaries	Allowance	5,000 FCFA/person·day			144 person·day	720,000	144 person·day	720,000	144 person·day	720,000	144 person·day	720,000	2,880,000	
		Transportation	110 FCFA/km			14,400 km	1,584,000	14,400 km	1,584,000	14,400 km	1,584,000	14,400 km	1,584,000	6,336,000	
	3. Establishing the storehouses	Construction cost	6,000,000 FCFA/storehouse			144 storehouse	864,000,000	144 storehouse	864,000,000	144 storehouse	864,000,000	144 storehouse	864,000,000	3,456,000,000	
	Subtotal					820,000		866,304,000		866,304,000		866,304,000		866,304,000	3,466,036,000
Extension of the Onion Storage Techniques	1. Establishing a technical guideline for onion storage	Allowance	25,000 FCFA/person·day	12 person·day	300,000									300,000	
		Transportation	110 FCFA/km	1,300 km	143,000										143,000
		Printing	100 FCFA/set	1,000 set	100,000										100,000
	2. Conducting trainings for extension staffs	Venue	5,000 FCFA/person·day			228 person·day	1,140,000	228 person·day	1,140,000						2,280,000
		Allowance of participants	25,000 FCFA/person·day			221 person·day	5,525,000	221 person·day	5,525,000						11,050,000
		Transportation of participation	110 FCFA/km			44,200 km	4,862,000	44,200 km	4,862,000						9,724,000
		Allowance of trainers	5,000 FCFA/person·day			7 person·day	35,000	7 person·day	35,000						70,000
		Printing of textbooks	250 FCFA/set			221 set	55,250	221 set	55,250						110,500
	3. Conducting trainings for producers	Venue	5,000 FCFA/person·day			264 person·day	1,320,000	264 person·day	1,320,000	264 person·day	1,320,000	264 person·day	1,320,000	5,280,000	
		Allowance of participants	10,000 FCFA/person·day			240 person·day	2,400,000	240 person·day	2,400,000	240 person·day	2,400,000	240 person·day	2,400,000	9,600,000	
		Transportation of participation	110 FCFA/km			24,000 km	2,640,000	24,000 km	2,640,000	24,000 km	2,640,000	24,000 km	2,640,000	10,560,000	
		Allowance of trainers	5,000 FCFA/person·day			24 person·day	120,000	24 person·day	120,000	24 person·day	120,000	24 person·day	120,000	480,000	
	Subtotal					543,000		18,097,250		18,097,250		6,480,000		6,480,000	49,697,500
Total					59,795,000		961,096,250		961,096,250		964,797,000		935,838,000	3,882,822,500	

Promotion Plan for Soybean: Breakdown of Project Cost

Project	Activity	Item	Unit Price	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount		
Increase of Supply Volume in the Domestic Market	1. Procurement of soybean seeds (Unit price of certified seeds: 350 FCFA/kg, cotton companies pay 50% of the seed cost.)	Distribution quantity (cotton companies) (40,000kg/province/year) (Share of cotton companies is not included in the unit price.)	7,000,000 FCFA/province	3 provinces	21,000,000	3 provinces	21,000,000	14 provinces	98,000,000	14 provinces	98,000,000	14 provinces	98,000,000	336,000,000	
		Distribution quantity (DPARHASA) (10,000kg/province/year)	3,500,000 FCFA/province	3 provinces	10,500,000	3 provinces	10,500,000	14 provinces	49,000,000	14 provinces	49,000,000	14 provinces	49,000,000	168,000,000	
	2. Transportation of soybean seeds (Hiring a truck: 500,000 FCFA/truck, one truck/province, 2days/province)	Hiring cost for truck (one truck/province, 2 days/province, including fuel)	1,000,000 FCFA/province	3 provinces	3,000,000	3 provinces	3,000,000	14 provinces	14,000,000	14 provinces	14,000,000	14 provinces	14,000,000	48,000,000	
	3. Meeting (once/year in each province)	Meeting cost (including allowance, transportation fee, venue fee,	700,000 FCFA/time*province	3 provinces	2,100,000	3 provinces	2,100,000	14 provinces	9,800,000	14 provinces	9,800,000	14 provinces	9,800,000	33,600,000	
	4. Matching meeting (once/year in each province)	Matching meeting cost (including allowance, transportation fee, venue fee,	700,000 FCFA/time*province	3 provinces	2,100,000	3 provinces	2,100,000	14 provinces	9,800,000	14 provinces	9,800,000	14 provinces	9,800,000	33,600,000	
	5. Management cost and reserve fund	20% of costs of above items are divided.			6,192,000		6,192,000		37,152,000		37,152,000		37,152,000	123,840,000	
Subtotal					44,892,000		44,892,000		217,752,000		217,752,000		217,752,000	743,040,000	
Sensitization of Soybean-processed Food	1. Formulation of implementation plan for sensitization	Allowance for participants of meetings (30 participants/meeting, 15 meetings/year)	25,000 FCFA/person*time	600 person*time	15,000,000	300 person*time	7,500,000							22,500,000	
		Transportation fee for participants of meetings (15 participants come from outside of Ouagadougou.)	5,000 FCFA/person*time	300 person*time	1,500,000	150 person*time	750,000								2,250,000
		Management cost and reserve fund (20% of costs of above items are divided.)			2,475,000		2,475,000								4,950,000
	2. Preparation of sensitization of materials for each medium and its implementation	Preparation of TV and radio programs	250,000 FCFA/programs	14 programs	3,500,000	10 programs	2,500,000								6,000,000
		Publish news paper articles	200,000 FCFA/article	10 article	2,000,000	6 article	1,200,000								3,200,000
Preparation of education and extension materials		1,600 FCFA/copy	4,000 copy	6,400,000	2,000 copy	3,200,000								9,600,000	
3. Participation in general fairs	Exhibition cost (including allowance, transportation fee, etc.)	800,000 FCFA/time	2 time	1,600,000	2 time	1,600,000								3,200,000	
4. Holding soybean fair (Ouagadougou)	Fair conducting cost	2,000,000 FCFA/time	1 time	2,000,000	1 time	2,000,000								4,000,000	
Subtotal					36,355,000		23,105,000							59,460,000	
Improvement of Knowledge and Techniques on Tofu related Food Processing	1. Processing trial and commercialization of Tofu related food	Introduction and development cost (a set of cost for introduction and development)	1,000,000 FCFA/set	10 set	10,000,000	10 set	10,000,000	10 set	10,000,000					30,000,000	
		Commission fee (commissioning ABNORM)	15,586,000 FCFA/set		14,903,000		683,000								15,586,000
	3. Preparation of extension materials for Tofu related food	Preparation cost of extension materials	500,000 FCFA/material	5 materials	2,500,000	5 material	2,500,000	5 material	2,500,000						7,500,000
		Printing cost (total 5 materials)	1,500 FCFA/copy	15,000 copy	22,500,000	15,000 copy	22,500,000	15,000 copy	22,500,000						67,500,000
	4. Implementation of survey on actual condition of Tofu related food processing industries (5 target areas)	Surveyor fee	50,000 FCFA/person*day	250 person*day	12,500,000	375 person*day	18,750,000								31,250,000
		Allowance and accommodation fee for surveyors	25,000 FCFA/person*day	250 person*day	6,250,000	250 person*day	6,250,000								12,500,000
		Transportation (rent a car)	25,000 FCFA/car*day	100 car*day	2,500,000	100 car*day	2,500,000								5,000,000
		Fuel cost	750 FCFA/km	25,000 km	18,750,000	25,000 km	18,750,000								37,500,000
	5. Formulation of extension plans on Tofu related food (in above target areas)	Preparation and printing of reports	20,000 FCFA/copy			500 copy	10,000,000	500 copy	10,000,000						20,000,000
		Allowance of related persons	25,000 FCFA/person*day			100 person*day	2,500,000	300 person*day	7,500,000						10,000,000
Transportation fee for related persons		5,000 FCFA/person*day			59 person*day	295,000	150 person*day	750,000						1,045,000	
6. Implementation of the extension plans (in above target areas)	Management cost and reserve fund (20% of costs of above items are divided.)					773,150		1,435,850						2,209,000	
	Workshop cost	700,000 FCFA/time					10 time	7,000,000	32 time	22,400,000	18 time	12,600,000		42,000,000	
7. Follow-up activities for individual industries	Allowance and transportation fee for instructors	30,000 FCFA/person*day					50 person*day	1,500,000	120 person*day	3,600,000	130 person*day	3,900,000		9,000,000	
Subtotal					89,903,000		95,501,150		63,185,850		26,000,000		16,500,000	291,090,000	
Strengthening of Capacity and Function of the Soybean Core Group	1. Formulation of 2-year action plan (in Ouagadougou)	Allowance for the participants of meetings	25,000 FCFA/person*day	350 person*day	8,750,000	150 person*day	3,750,000							12,500,000	
		Transportation fee for the participants of meetings	5,000 FCFA/person*day	100 person*day	500,000	100 person*day	500,000								1,000,000
		Management cost and reserve fund (20% of costs of above items are divided.)			1,850,000		850,000								2,700,000
	2. Implementation of the action plan and monitoring	Monitoring cost (Travel cost for DGPER staffs)	30,000 FCFA/perosn*day	180 FCFA/perosn*day	5,400,000	180 FCFA/perosn*day	5,400,000								10,800,000
		Procurement cost of computer	275,000 FCFA/set	2 sets	550,000										550,000
		Preparation cost of homepage, etc. (up-loading database of filière stakeholders)	100,000 FCFA/set	2 set	200,000										200,000
		Seminar cost	700,000 FCFA/time	4 time	2,800,000	4 time	2,800,000								5,600,000
4. Management cost and reserved fund	Workshop cost (sensitization of soybean processed food)	700,000 FCFA/time	18 time	12,600,000	18 time	12,600,000								25,200,000	
	Management cost and reserve fund (20% of costs of above items are divided.)			4,310,000		4,160,000								8,470,000	
Subtotal					36,960,000		30,060,000							67,020,000	
Promotion of Organization and Cooperation of Filière Stakeholders	1. Organization cost of filière stakeholders	Workshop cost (2 times/year/province, 2 years)	700,000 FCFA/time			48 time	33,600,000	48 time	33,600,000					67,200,000	
		Travel cost for MARHASA staffs (3 persons/time, 3 days/time)	30,000 FCFA/person*day			432 person*day	12,960,000	432 person*day	12,960,000						25,920,000
	2. Formulation of action plans	Workshop cost (2 times/province)	700,000 FCFA/time				48 time	33,600,000							33,600,000
		Travel cost for MARHASA staffs (3 persons/time, 3 days/time)	30,000 FCFA/person*day				432 person*day	12,960,000							12,960,000
	3. Implementation of the action plans and monitoring	Monitoring cost (travel cost for MARHASA staffs) (3 persons/time, 2 days/time, 6	30,000 FCFA/person*day				864 person*day	25,920,000	864 person*day	25,920,000	864 person*day	25,920,000	864 person*day	25,920,000	77,760,000
Workshop cost (2 times/year/province, 2 years)		700,000 FCFA/time				48 time	33,600,000	48 time	33,600,000					67,200,000	
Subtotal							46,560,000		141,811,200		82,291,200		70,905,600	341,568,000	
Total					208,110,000		240,118,150		422,749,050		326,043,200		305,157,600	1,502,178,000	

It is assumed that an action plan implemented in the "project for strengthening of capacity and function of the soybean core group" is the "project for sensitization of soybean-processed food". Therefore, implementation cost of the action plan is included in the "project for sensitization of soybean-processed food". Project cost of the "project for promotion of organization and cooperation of filière stakeholders" does not include implementation cost of the action plan formulated in the project.

2. Minutes of Meetings of the Joint Coordination Committee

MINISTERE DE L'AGRICULTURE ET DE LA
SECURITE ALIMENTAIRE

SECRETARIAT GENERAL

DIRECTION GENERALE DE LA PROMOTION
DE L'ECONOMIE RURALE

PROJET D'APPUI A L'ELABORATION D'UN
SCHEMA DIRECTEUR POUR LA PROMOTION
D'UNE AGRICULTURE ORIENTEE VERS LE
MARCHE

BURKINA FASO
Unité – Progrès - Justice

**RAPPORT DE LA 1^{ère} REUNION DU COMITE DE PILOTAGE DU
PROJET D'APPUI A L'ELABORATION D'UN SCHEMA DIRECTEUR
POUR LA PROMOTION D'UNE AGRICULTURE ORIENTEE VERS LE
MARCHE (PAPAOM)**

Junin 2013



Introduction

Le mercredi 12 Juin 2013, s'est tenue dans la salle de conférence du Ministère de l'Agriculture et de la Sécurité Alimentaire (MASA) la première réunion du comité de pilotage du Projet d'appui à l'élaboration d'un schéma directeur pour la promotion d'une agriculture orientée vers le marché (PAPAOM). Etaient présents à la rencontre les membres statutaires et les membres observateurs (cf. liste de présence en annexe).

L'objectif de cette réunion était de présenter le projet et son niveau actuel de mise en œuvre ainsi que les attributions du comité de pilotage et aux membres du dit comité.

1. Ouverture des travaux

La réunion a débuté à 9 heures avec les mots de remerciements de Monsieur le Secrétaire Général du Ministère de l'Agriculture et de la Sécurité Alimentaire, président du Comité de Pilotage. Dans son allocution, il a rappelé la cohérence des objectifs du projet avec la vision du gouvernement déclinée dans la SCADD et le PNSR. Par la suite la parole a été donnée au représentant résident de la JICA au Burkina Faso. Il a fait observer que l'agriculture est un domaine prioritaire des interventions de la JICA. Cela se traduit par l'accompagnement dans le processus d'élaboration et de mise en œuvre du PNSR. Le président du Comité de Pilotage a ensuite déclaré ouverte la réunion.

Le président du comité de pilotage a ensuite vérifié le quorum de participation avant la poursuite des travaux selon l'ordre du jour suivant.

- Présentation du projet, incluant la présentation de la sélection primaire des produits agricoles
- Présentation des attributions du Comité de Pilotage
- Echanges et recommandations

2. Déroulement des travaux

Le Dr Amadou SIDIBE, Directeur du Développement des Marchés des Produits Agricoles, homologue du chef de l'équipe des experts de la JICA, a présenté le projet et les attributions du Comité de Pilotage.

2.1 Présentation du projet

L'exposé s'est articulé autour des points suivants :

- **Le contexte de l'étude**

Malgré une agriculture occupant le premier plan dans l'économie du pays (86% de la population employée et contribuant à plus de 25% au PIB), le revenu moyen des producteurs reste toujours faible et 46,5% de la population vit en dessous du taux de pauvreté. D'où la nécessité de la mise en place d'une stratégie agricole mieux orientée vers le marché.

- **L'objectif du projet**

- Elaborer un schéma directeur et les plans d'actions pour trois à quatre produits agricoles avec du potentiel;
- Elaborer une stratégie de promotion à l'exportation et/ou de réduction à l'importation pour ces trois à quatre produits agricoles.

- **Le mécanisme du projet**

- Sélection initiale de produits agricoles, considérés comme prioritaires par la Stratégie Nationale pour l'Exportation et par la Stratégie Nationale de Développement des Filières Agricoles, ainsi que de produits avec un potentiel de développement futur.

2

- Sélection primaire des produits agricoles potentiels, effectuée sur la base de sept critères définis par le groupe de travail. Deux à trois produits sont sélectionnés par marché cible (Marché international, sous-régional, national, produits à potentiel). La sélection primaire a été effectuée sur la base des sept critères suivants :
 - o Positionnement en tant que produit prioritaire
 - o Existence et importance de la demande internationale
 - o Existence et importance des exportations par le Burkina Faso
 - o Existence et importance des importations par le Burkina Faso, et possibilités de les remplacer par la production nationale
 - o Taux de rentabilité des exploitations
 - o Evolution de la production sur les dix dernières années
 - o Conditions de culture

Les onze produits suivants ont été sélectionnés par marché cible :

- o Marché international : Mangue, sésame et noix de cajou
 - o Marché sous-régional : niébé et tomate
 - o Marché national : riz et oignon
 - o Produits à potentiel futur : fraise, soja, piment et souchet
- Sélection secondaire des produits agricoles potentiels, devant aboutir au choix de trois à quatre produits sur la base de plusieurs critères, définis par le groupe de travail, ainsi que sur les résultats de l'analyse préliminaire des chaînes de valeur des produits sélectionnés lors de la sélection primaire
 - Analyse de la chaîne de valeur des produits sélectionnés
 - Développement et mise en œuvre des activités pilotes
 - Proposition de projet d'investissement

- **La mise en œuvre du projet**

Elle sera assurée par :

- La DGPER
- L'équipe des experts de la JICA

L'équipe des experts de la JICA et les homologues de la DGPER constituent le groupe de travail du projet.

Les détails concernant les conditions de rapportage ainsi que le calendrier d'exécution du projet ont également été explicités lors de la présentation.

2.2 Présentation des attributions du comité du pilotage

Cette présentation s'est attardée sur les attributions et le fonctionnement du comité de pilotage.

Le Comité de Pilotage a un rôle de consultation dans la mise en œuvre du projet.

A ce titre, il est chargé :

- d'approuver le plan de travail annuel du projet ;
- d'examiner les progrès d'ensemble et les réalisations du projet ;
- d'examiner des questions majeures découlant de la mise en œuvre du projet ;
- d'élaborer les modifications des activités au besoin ;
- discuter de toute autre question pertinente pour la bonne exécution du projet.

2.3 Les échanges

A l'issue des présentations, les membres du comité de pilotage ont fait part de leurs remarques, en particulier sur les points suivants :

1. Produits sélectionnés et critères de sélection

Les participants ont demandé des précisions concernant la base de sélection des vingt-trois produits agricoles. Des intervenants ont également demandé des éclaircissements sur la correspondance entre les niveaux évoqués dans les critères de sélection (de « faible » à « important ») et les données. Les membres du comité ont également rappelé l'importance de considérer chaque maillon de la chaîne de valeur, en prenant bien en compte des aspects tels que les intrants ou la qualité des produits.

Le chef de l'équipe d'étude a apporté des précisions concernant ces préoccupations. La base de sélection initiale de produits agricoles a été identifiée en fonction des produits considérés comme prioritaires par la Stratégie Nationale pour l'Exportation (trois produits dans le champ de l'étude) et par la Stratégie Nationale de Développement des Filières Agricoles (quatorze produits), et complétée avec des produits présentant un potentiel de développement futur (six produits). La logique de sélection est également expliquée dans le rapport préliminaire ainsi que dans le plan de travail.

Les niveaux évoqués, de « faible » à « important », correspondent à un classement de données quantitatives, en particulier pour le niveau de la demande internationale, pour les exportations et les importations. Le taux de rentabilité ainsi que les conditions de culture ont été évalués selon des critères qualitatifs (facilité de production, besoins en eau et en technologies, etc.).

Enfin, le chef de l'équipe d'étude a expliqué au Comité de Pilotage que l'ensemble de la chaîne de valeur de chaque produit sélectionné ferait l'objet d'une analyse (analyse préliminaire pour les produits retenus dans la sélection primaire, et analyse approfondie pour les produits retenus lors de la sélection secondaire).

2. Collaboration avec d'autres services, projets et partenaires techniques et financiers

Les membres du Comité de Pilotage ont fait part de leurs interrogations sur les mécanismes de collaboration avec les projets et programmes actuellement mis en œuvre par le gouvernement et les partenaires techniques et financiers. De la même façon, ceux-ci ont insisté sur l'importance de prendre en compte les travaux réalisés par d'autres structures. Enfin, l'implication d'autres structures au sein du groupe de travail a également été proposée.

Le chef de l'équipe d'étude a expliqué au Comité de Pilotage que le groupe de travail rencontrait certains Partenaires Techniques et Financiers, projets et programmes impliqués dans les mêmes filières et prenait en compte leurs expériences. Après le processus de sélection secondaire, il faudra déterminer si les filières choisies font déjà l'objet d'un

programme, et éventuellement déterminer les possibilités de synergies. Le groupe de travail appellera, lorsque nécessaire, les structures qui sont susceptibles d'apporter leur expérience et d'appuyer le projet.

Le Dr. Sidibe, homologue du chef d'équipe, a également expliqué qu'il est prévu dans l'exécution du projet la mise en place de réunions des parties prenantes. Les parties prenantes sont composées de tous les acteurs (organisations professionnelles, partenaires techniques et financiers, etc.) intervenant dans les filières concernées. Les parties prenantes se réuniront plusieurs fois pendant le projet, dans l'objectif de partager les expériences pour la bonne conduite du projet.

3. Durée et champ du projet, commentaires sur le rapport préliminaire

Les membres du Comité de Pilotage ont demandé des précisions sur la durée et le budget du projet ainsi que sur son champ d'application.

Le chef de l'équipe d'étude a demandé au Comité de Pilotage de se référer au Rapport Préliminaire, dans lequel sont détaillés le calendrier d'exécution ainsi que le budget.

3. Conclusion

Le Comité de Pilotage a donné son accord pour la sélection primaire des produits effectuée par le groupe de travail du projet. Il a également consenti au rapport préliminaire et au plan de travail, présentés lors de cette session.

Les principales recommandations de la réunion sont :

- Mieux explorer les travaux existants ;
- Trouver un mécanisme de collaboration avec les projets et programmes en cours d'exécution pour éviter les chevauchements ou parvenir à une synergie ;

La rencontre a pris fin aux environs de 12h avec les mots d'encouragement du Président du comité de pilotage.

Ont signé :

Le Président du Comité de Pilotage

Moussa KABOR



Le Rapporteur

Dr Amadou SIDIBE



MINISTERE DE L'AGRICULTURE
ET DE LA SECURITE ALIMENTAIRE

SECRETARIAT GENERAL

DIRECTION GENERALE DE LA
PROMOTION DE L'ECONOMIE RURALE

PROJET D'APPUI A L'ELABORATION D'UN
SCHEMA DIRECTEUR POUR LA PROMOTION
D'UNE AGRICULTURE ORIENTEE VERS LE MARCHÉ

BURKINA FASO

Unité – Progrès - Justice

Compte rendu

**3^{ème} session du Comité de pilotage du Projet d'appui
à l'élaboration d'un schéma directeur pour la
promotion d'une agriculture orientée vers le marché
(PAPAOM)**

Juillet 2014

I. Introduction

L'an deux mil quatorze et le vingt quatre juin, s'est tenue dans la salle de conférence de la Direction générale de la promotion de l'économie rurale (DGPER), la 3^{ème} session du Comité de pilotage (COFIL) du Projet d'appui à l'élaboration d'un schéma directeur pour la promotion d'une agriculture orientée vers le marché (PAPAOM). Les points qui étaient inscrits à l'ordre du jour de cette session sont (i) l'adoption du rapport de la 2^{ème} session du COFIL, (ii) la présentation du bilan des activités réalisées depuis la dernière session du COFIL, (iii) la présentation du rapport intermédiaire, (iv) l'examen et l'adoption du Plan de travail et de budget annuel 2014 du projet et (v) les divers.

La session a été présidée par Monsieur Alain TAGNAN, Conseiller technique, représentant Monsieur le Secrétaire général. Il avait à ces côtés, Monsieur le Directeur général de la promotion de l'économie rurale et Monsieur le représentant résident de l'Agence de coopération internationale japonaise (JICA).

I. Déroulement de la session

1. Ouverture de la session

La cérémonie d'ouverture a été marquée par trois interventions :

Dans son mot de bienvenue, Monsieur le Directeur général de la promotion de l'économie rurale a tout d'abord souhaité la bienvenue à tous les participants et situé l'importance du projet pour le Burkina Faso. Par la suite, il a rappelé les quatre filières qui ont été adoptées lors de la 2^{ème} session du COFIL. Pour terminer, Monsieur le Directeur général de la promotion de l'économie rurale a souhaité des échanges constructifs au tour des points inscrits à l'ordre du jour.

Dans son mot, Monsieur le représentant résident de la JICA a d'abord rappelé la problématique traitée par le projet (comment produire pour le marché, quelles sont les conditions de marché pour les différents produits, etc.). Ensuite, il a rappelé les résultats attendus du Schéma directeur et situé l'intérêt des activités pilotes. Il a en outre invité les intervenants dans la mise en œuvre du projet à travailler dans un esprit de collaboration et de communication. Enfin, il a invité les membres du COFIL à des orientations constructives.

Le discours d'ouverture a été prononcé par Monsieur le Conseiller technique. Il a rappelé que le secteur agricole, malgré les conditions difficiles, enregistre des performances intéressantes. La production agricole connaît un accroissement ces dernières années. Cependant, les débouchés sont insuffisants pour absorber les surplus de production. D'où le besoin d'accompagnement de l'Etat et les partenaires au développement. Il a donc remercié la Coopération japonaise pour son appui aussi bien dans le cadre de ce projet que pour les autres interventions dans le domaine de

l'agriculture. Il a terminé en rappelant l'ordre du jour de la session et en remerciant les participants pour leur présence.

2. Vérification des présences

Après la cérémonie d'ouverture a suivi la vérification du quorum. A ce niveau, il a été noté l'absence de deux membres : le représentant de l'APEX-Burkina et le Conseiller JICA auprès du Secrétariat général du MASA. Le président a donc jugé que la session pouvait se tenir au regard du fait que le quorum était atteint.

3. Présentation et adoption du rapport de la 2ème session

A l'issue de la présentation, en plus des observations de formes, les amendements ont porté sur :

- ✓ l'absence de la liste de présence ;
- ✓ l'harmonisation des citations des titres des personnes dans le rapport ;
- ✓ l'absence des recommandations et du point de leur mise en œuvre.

4. Présentation du bilan des activités réalisées

Cette partie a été présentée pour informer les membres du COPIL des activités réalisées entre la 2^{ème} et la 3^{ème} session.

Les observations formulées à la suite de la présentation ont porté sur :

- ✓ le canevas de présentation du bilan : Il a été jugé que le canevas utilisé ne permet pas une bonne compréhension. Il a été proposé de prendre attache avec la DGESS pour disposer d'un canevas type ;
- ✓ le bilan quantitatif : ce bilan devrait se faire par activité réalisée ;
- ✓ la formulation des activités : des verbes d'actions devraient être utilisés ;
- ✓ la non participation de l'oignon au forum international Investir en Côte d'Ivoire (ICI 2014) ;
- ✓ le non déblocage, jusqu'à présent, des ressources financières (contrepartie nationale) ; ressources entrant dans le cadre de la mise en œuvre du présent projet.

5. Présentation du rapport intermédiaire

A ce niveau encore, il s'agissait de porter la substance du rapport aux membres du COPIL et de recueillir leurs observations. Ainsi, à l'issue de la présentation, plusieurs observations ont été formulées et se résument comme suit :

- ✓ consacrer un paragraphe sur les opportunités de marchés et les menaces ;
- ✓ s'inspirer des tentatives d'exportation de la fraise par l'UCOBAM. A ce niveau, envisager la possibilité d'exploiter les infrastructures de stockage à l'actif de la SOBFEL ;
- ✓ voir s'il n'y a pas de concurrence entre la culture de l'oignon en hivernage et les autres cultures en termes de terres utilisées. Il a été suggéré de mettre l'accent sur la conservation ;

- ✓ prendre en compte la région du Centre Est parmi les régions productrices d'oignon ;
- ✓ revoir la méthode de calcul des parts de marché dans le document. Il faudra faire la différence entre population et part de marché ;
- ✓ proposer des activités de promotion de la production de la mangue ;
- ✓ proposer des stratégies de mise en relation entre les zones déficitaires et les zones de production ;
- ✓ tirer les leçons des projets et programmes antérieurs et en cours ;
- ✓ définir une stratégie intégrée de promotion dans le schéma directeur ;
- ✓ définir le rôle du secteur privé dans le schéma directeur.

6. Présentation et adoption du PTBA

A ce niveau, le PTBA qui a été présenté a fait seulement cas des activités pilotes à mener jusqu'en février 2015, date de clôture du projet. A la fin de la présentation les observations ont portés sur :

- ✓ la notion de PTBA : il a été demandé de proposer un PTBA global du projet prenant en compte les autres rubriques autres que les activités pilotes ;
- ✓ la période couverte par le PTBA : a ce niveau, il a été demandé de se conformer à l'année budgétaire du Burkina Faso ;
- ✓ la formulation des activités : les participants ont suggéré d'harmoniser les intitulés, de formuler des résultats quantitatifs attendus et de définir les responsabilités dans la mise en œuvre.

Sous réserve des amendements, le PTBA 2014 du projet a été adopté.

II. Conclusion

A la fin des travaux, deux recommandations ont été formulées. Il s'agit :

- ✓ améliorer le taux d'exécution financière du projet ;
- ✓ suivre pour accélérer le processus de déblocage de la contrepartie nationale du projet.

Ont signé :

Représentant du président du
comité de pilotage



M. TAGNAN Alain

Le rapporteur



DIAWARA B. Ali

Ministère de l'agriculture, des ressources
hydrauliques, de l'assainissement et de la
sécurité alimentaire

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Secrétariat général

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Direction générale de la promotion de
l'économie rurale

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Projet d'appui à l'élaboration d'un schéma
directeur pour la promotion d'une
agriculture orientée vers le marché

BURKINA FASO



Unité – Progrès - Justice

COMPTE RENDU

4^{ème} session du Comité de pilotage du Projet d'appui à
l'élaboration d'un schéma directeur pour la promotion
d'une agriculture orientée vers le marché (PAPAOM)

Avril 2015

I. Introduction

Le 21 avril de l'année 2015 s'est tenue dans la salle de conférence de la Direction générale de la promotion de l'économie rurale (DGPER), la quatrième session du Comité de pilotage (COPIL) du projet d'appui à l'élaboration d'un schéma directeur pour la promotion d'une agriculture orientée vers le marché (PAPAOM).

La présente session était placée sous la présidence de Monsieur NONGUIERMA P. André, Chargé de mission au Ministère de l'agriculture, des ressources hydrauliques, de l'assainissement et de la sécurité alimentaire, représentant Monsieur le Secrétaire général dudit ministère. Il était assisté de Monsieur Denis OUEDRAOGO, Directeur général de la promotion de l'économie rurale et de Monsieur Morishita Hironichi de l'Agence japonaise de coopération internationale (JICA-Burkina Faso).

Les points inscrits à l'ordre du jour de la 4^{ème} session du COPIL étaient :

- présentation du rapport final provisoire ;
- bilan de la mise en œuvre du projet
- adoption du rapport de la 3^{ème} session du COPIL et
- divers.

II. Ephéméride de la session

2.1. La cérémonie d'ouverture

La cérémonie d'ouverture de la quatrième session du COPIL a été marquée successivement par les mots du Directeur général de la promotion de l'économie rurale, du représentant de JICA-Burkina Faso et le discours d'ouverture du président de séance.

❖ Le mot du Directeur général de la promotion de l'économie rurale

Dans son mot introductif Monsieur Denis OUEDRAOGO a tout d'abord, souhaité la bienvenue à l'ensemble des participants pour avoir effectué le déplacement pour prendre part à la session. Il a ensuite situé le contexte de la tenue de cette quatrième session du COPIL. En effet, le Projet d'appui à l'élaboration d'un schéma directeur pour la promotion d'une agriculture orientée vers le marché (PAPAOM), qui a été initié par le Gouvernement burkinabè avec l'appui technique et financier du Japon

pour une durée de 2 ans, tire à sa fin. Ainsi, il est plus que nécessaire pour les parties prenantes, à la suite de la troisième session, de se retrouver dans l'optique de faire le bilan du projet depuis sa mise en œuvre et de donner les grandes orientations sur le rapport définitif provisoire issu des travaux de l'équipe du projet en vue de la préparation de l'atelier national de validation du schéma directeur. Le Directeur général dans son discours, a tenu à remercier également les organisateurs de la session, de même que les membres du groupe de travail pour le travail qui a abouti à cette journée et pour les nombreux efforts consentis pour la bonne marche du projet. Enfin, Monsieur Denis OUEDRAOGO a exhorté les participants à des contributions sans complaisance, mais constructives, pour l'amélioration du schéma directeur.

❖ Discours du représentant de la JICA-Burkina Faso

Monsieur Morishita dans son discours a tenu à remercier l'ensemble des participants et en particulier le président de séance, le DGPER et les membres du groupe de travail DGPER-PAPAOM pour les efforts consentis pour aboutir de la quatrième session du COPIL. Il a, par la suite, fait cas de la situation économique du Burkina Faso marquée par une importation massive de produits alimentaires et/ou agroalimentaires. Le projet PAPAOM s'inscrit dans la perspective d'accroître la production agricole nationale burkinabè en vue d'améliorer la balance commerciale par la baisse des importations en produits alimentaires. En outre, il vise à réduire le niveau de pauvreté par l'amélioration du revenu agricole des producteurs et la hausse du niveau des exportations du pays. Il a également relevé les défis auxquels le Burkina Faso fait face en matière de développement agricole : défis en termes d'amélioration de la productivité, de transformation, de commerce et de paquets technologiques pour la production. Le schéma directeur se veut être un document de référence en matière de promotion d'une agriculture orientée vers le marché au Burkina Faso. Cela traduit tout l'enjeu lié à son élaboration et sa compréhension par les parties prenantes. A la fin de son discours, il a réitéré la disponibilité du Gouvernement japonais à toujours soutenir les activités de développement surtout dans le domaine agricole au Burkina Faso.

❖ Discours du président de séance

Le président de séance, représentant Monsieur le Secrétaire général du Ministère de l'Agriculture, des ressources hydrauliques, de l'assainissement et de la sécurité alimentaire, dans son discours d'ouverture, a tout d'abord souhaité la bienvenue à l'ensemble des participants à la 4^{ème} session du COPIL du PAPAOM. Il a, par la suite, situé le contexte de la mise en œuvre de ce projet qui est marqué par des difficultés de transformation et d'écoulement des produits agricoles. C'est ainsi que le Gouvernement burkinabè avec l'appui technique et financier de celui du Japon a initié cette étude en vue d'accompagner les acteurs du monde rural dans l'émergence de leurs activités de production, de transformation et de commercialisation. Il a également rappelé les objectifs du projet, les processus ayant conduit aux choix des quatre filières d'intervention du projet (mangue, fraise, oignon et soja) ainsi que des plans d'actions proposés par l'équipe d'experts. En outre, Monsieur le président de séance a présenté les points inscrits à l'ordre du jour de la session. Avant de terminer son discours, il a invité les participants à se pencher sans complaisance sur le document pour relever tous les amendements nécessaires afin de lui conférer son nom de schéma directeur pour la promotion d'une agriculture tournée vers le marché. Avant de déclarer ouverte la 4^{ème} session du COPIL du PAPAOM, il a tenu à remercier l'équipe d'experts de la JICA pour le travail abattu.

2.2. La vérification du quorum

A la suite de la cérémonie d'ouverture Monsieur David K. TIEMTORE a procédé à la vérification des présences en appelant les noms des structures membres du COPIL. Il a été noté une absence (la Maison de l'Entreprise du Burkina Faso) et un retardataire qui s'est signalé (le Ministère de l'Economie et des finances). Le quorum étant atteint, le président a autorisé la poursuite de la session en déroulant les points inscrits à l'ordre du jour.

Mais avant le début des présentations un tour de table a permis aux participants de se présenter.

2.3. Présentation des termes de référence

Les TDR sont constitués de six points dont le contexte et la justification, l'ordre du jour, les résultats attendus, la date et le lieu de la session, la prise en charge des membres du COPIL et l'agenda de la session. Après présentation des points à l'ordre du jour (cités ci-dessus) et des résultats attendus de la session par Monsieur Hypolite Z. KABA, les membres du COPIL ont adoptés à l'unanimité les TDR.

2.4. Présentation du rapport final provisoire

Le plan de présentation du rapport final provisoire du schéma directeur est composé de neuf (09) points. Les huit (08) premiers points ont été présentés par Monsieur David K. TIEMTORE, Directeur du développement des marchés des produits agricoles (DDMPA) et le dernier point a été présenté par Monsieur Shigeru TAKAGI, Chef du projet.

❖ Présentation du rapport provisoire

La présentation de Monsieur TIEMTORE s'est articulée autour de deux grands points : les généralités sur le schéma directeur et l'économie du Burkina Faso et les plans de promotion des quatre filières sélectionnées dans le cadre du projet.

Les généralités sur le schéma directeur et l'économie burkinabè ont concerné :

- le positionnement du schéma directeur qui s'inscrit dans le cadre du programme national du secteur rural (PNSR) et dans la stratégie de développement des filières agricoles (SDFA) ;
- l'objectif du schéma directeur qui est l'augmentation des revenus des acteurs du monde rural par la promotion et la diversification des débouchés des produits agricoles burkinabè à travers l'approche chaîne de valeur ;
- l'approche de base du schéma directeur qui est de fournir des produits répondant aux exigences de marché de consommateurs par la collecte d'information ;
- l'approche de promotion des produits par type de marché (marché international, marché sous-régional et marché national) et
- le rappel des quatre filières sélectionnées (Mangue, fraise, soja et oignon) avec leurs débouchés potentiels.

Les 4 derniers points de la présentation ont porté sur les plans de promotion des 4 filières. Pour chaque filière, il a été procédé à une revue du contexte de commercialisation, des objectifs poursuivis, de l'approche de promotion et du planning des activités durant la période de mise en œuvre du projet.

❖ **Présentation des recommandations**

Les recommandations du projet ont été présentées par Monsieur Shigeru TAKAGI. Les points ayant fait l'objet de présentation sont : l'unité de mise en œuvre du projet qui serait la DGPER qui devrait procéder à la création d'un service de promotion d'une agriculture orientée vers marché en son sein ; les activités prioritaires par filières et les remarques d'ordre général.

2.5. Présentation du bilan de mise en œuvre du projet.

Cette présentation qui a été faite par Monsieur Hypolite Z. KABA a concerné le bilan financier de mise en œuvre du projet durant les deux années. Elle a fait le point du bilan financier annuel (montant et taux de réalisation) et le bilan financier global. En effet, le projet connaît une réalisation de l'ordre de 73.70% depuis sa mise en œuvre. Le taux de réalisation émanant de la partie japonaise est de 82.67% tandis que celui du Burkina Faso est de 10.85%.

2.6. Les échanges

A l'issue des différentes présentations, les membres du COPIL ont formulé des observations et à poser des questions d'éclaircissement. Au nombre des observations on peut retenir :

A propos du rapport du schéma directeur :

- l'importance du volume du rapport du schéma directeur ;
- l'absence de résumé exécutif du rapport pour donner un aperçu général de son contenu ;
- la durée de planification des activités de promotion : il a été demandé de recadrer les activités sur une période de cinq ans comme tel est le cas de la plupart des activités des projets s'exécutant au Burkina Faso. En outre, la durée pourrait s'aligner sur celle de la deuxième phase du PNSR (2016-2020) ;

- les fautes dans le document : il a été noté qu'il y a beaucoup de coquilles dans le document qui doivent être corrigées pour faciliter sa lecture ;
- l'absence d'une bibliographie et des sources des données utilisées ;
- la prise en compte insuffisante des aspects liés à la qualité dans le document ;
- l'encrage institutionnel de mise en œuvre du projet : la proposition de création d'un service spécifique n'a pas été acceptée du fait de l'existence d'un service à la DGPER qui a cette mission ;
- le niveau d'organisation des acteurs directs des filières agricoles : il a été demandé de s'assurer des capacités en terme de gouvernance, des organisations des acteurs impliquées dans la mise en œuvre des plans de promotion proposés ;
- la notion d'accroissement de la production : à ce niveau, il a été demandé de ne pas parler d'augmentation des superficies, mais de mettre l'accent sur l'amélioration de la productivité à travers l'intensification ;
- la non prise en compte du Japon comme marché cible des produits à promouvoir : il a été demandé de considérer le Japon comme marché potentiel de la mangue ;
- l'insuffisance des mesures pour promouvoir la consommation nationale des produits burkinabé ;

A propos du bilan financier :

- la rubrique formation au Japon : les membres du comité ont demandé des explications sur la non utilisation de cette rubrique ;
- la rubrique interprétariat : les membres constatent qu'elle est en dépassement ;
- le taux d'exécution financière de la contre partie nationale : les membres du COPIL ont jugé le taux très faible, après deux ans de mise en œuvre.

A ces observations s'ajoutent des questions d'éclaircissement auxquelles la partie japonaise et leurs homologues de la DGPER ont apporté des éléments de réponse. Il s'agit notamment des questions sur la prise en compte de la lutte contre la mouche de fruit, l'introduction des séchoirs tunnels, les variétés de la fraise, les marchés cibles de l'oignon.

Les échanges se sont achevés sur les recommandations suivantes :

- organiser la relecture du schéma directeur en vue de corriger les fautes, les incohérences et de reformuler les parties qui doivent l'être avant l'atelier national de validation ;
- faire un résumé exécutif du schéma directeur en une dizaine de page ;
- Mettre l'accent sur l'amélioration de la productivité des cultures au lieu de l'accroissement superficies de production ;
- prendre en compte la DGPV dans les activités liées à la production (l'identification des variétés) ;
- poursuivre les démarches pour le déblocage du budget correspondant à la contrepartie nationale ;
- développer d'avantage les perspectives et les conclusions du rapport ;
- évoquer les difficultés rencontrées au cours de l'élaboration du schéma directeur.

A ces recommandations, le groupe de travail DGPER-PAPAOM a rassuré les participants que des mesures seront prises dans le sens d'améliorer le contenu du document en intégrant tous les amendements qui ont été portés.

2.7. Présentation et adoption du compte rendu de la troisième session du COPIL

Le compte rendu de la 3^{ème} session du COPIL s'articule autour de trois grands points. Il s'agit de :

- l'introduction ;
- le déroulement de la 3^{ème} session qui est composé de six sous-points ;
- la conclusion

Ces trois points ont été abordés tour à tour par les participants qui ont apporté les différents amendements. A l'issue de cet exercice, le rapport de la 3^{ème} session a été adopté.

3. DIVERS

En divers, le DGPER Le invité les participants à prendre part à la JNP prévue du 23 au 25 avril 2015 à Dédougou dans la région de la boucle du Mou houn.

Conclusion

La 4^{ème} session du COPIL a été riche en contributions pour l'amélioration du document final. Avant de prendre rendez-vous pour l'atelier de validation, le président de séance a réitéré les remerciements de Monsieur le Secrétaire général du MARHASA, Président du comité de pilotage, à l'endroit de tous les participants et a insisté auprès des membres du groupe de travail à se pencher sérieusement sur la relecture du rapport avant soumission à l'atelier national de validation. A la partie japonaise, il leur a réitéré ses remerciements pour la bonne coopération durant la réalisation de l'étude.

Ont signé :

Le président de séance



NONGUIERMA André P.

Le rapporteur



TIEMTORE K. David