Japan International
Cooperation Agency

Ministry of Agriculture
Hydraulics and Halieutics
Burkina Faso

STUDY ON THE SYSTEM TO ALLEVIATE THE LAND DEGRADATION IN BURKINA FASO

FINAL REPORT

March 2004

Japan Green Resources Agency (J-Green)

PREFACE

In response to a request from the Government of the Republic of Burkina Faso, the Government of Japan decided to conduct the Study on the System to Alleviate the Land Degradation in Burkina Faso and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA dispatched a study team headed by Mr. Akira ITO of the Japan Green Resources Agency to the Republic of Burkina Faso between December 2001 and February 2004.

The team held discussions with the officials concerned in the Government of the Republic of Burkina Faso, and conducted field surveys in the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

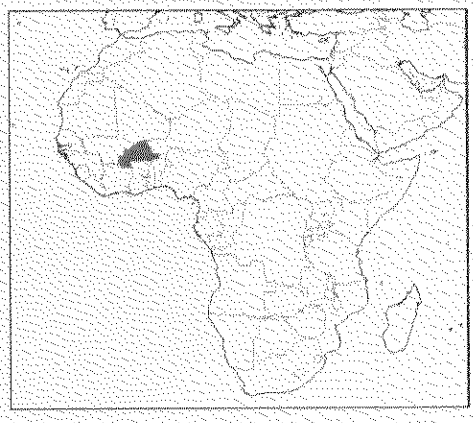
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials of the Government and those concerned in the Republic of Burkina Faso for the close cooperation they have extended to the study.

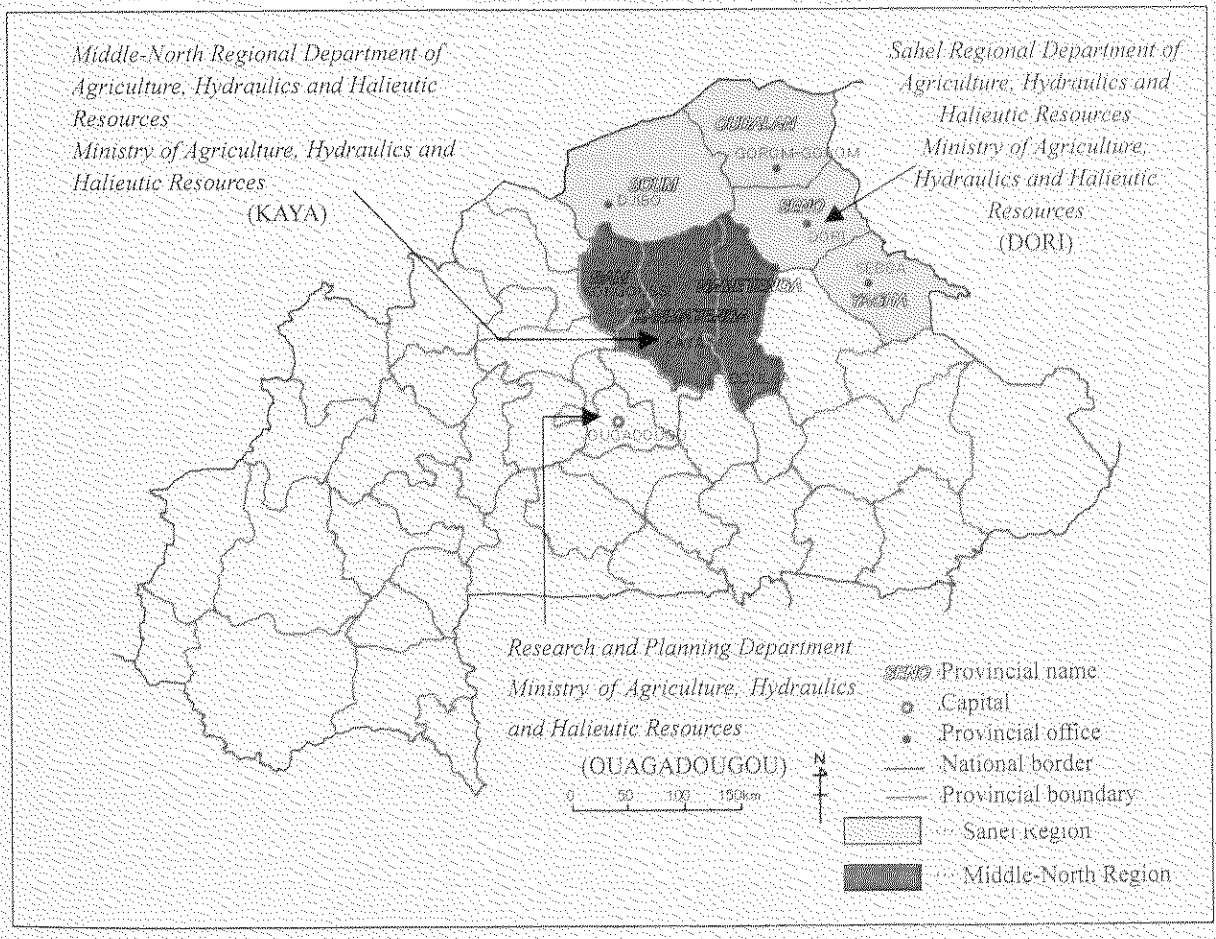
March 2004

Shinki SUZUKI
Vice-President
Japan International Cooperation Agency

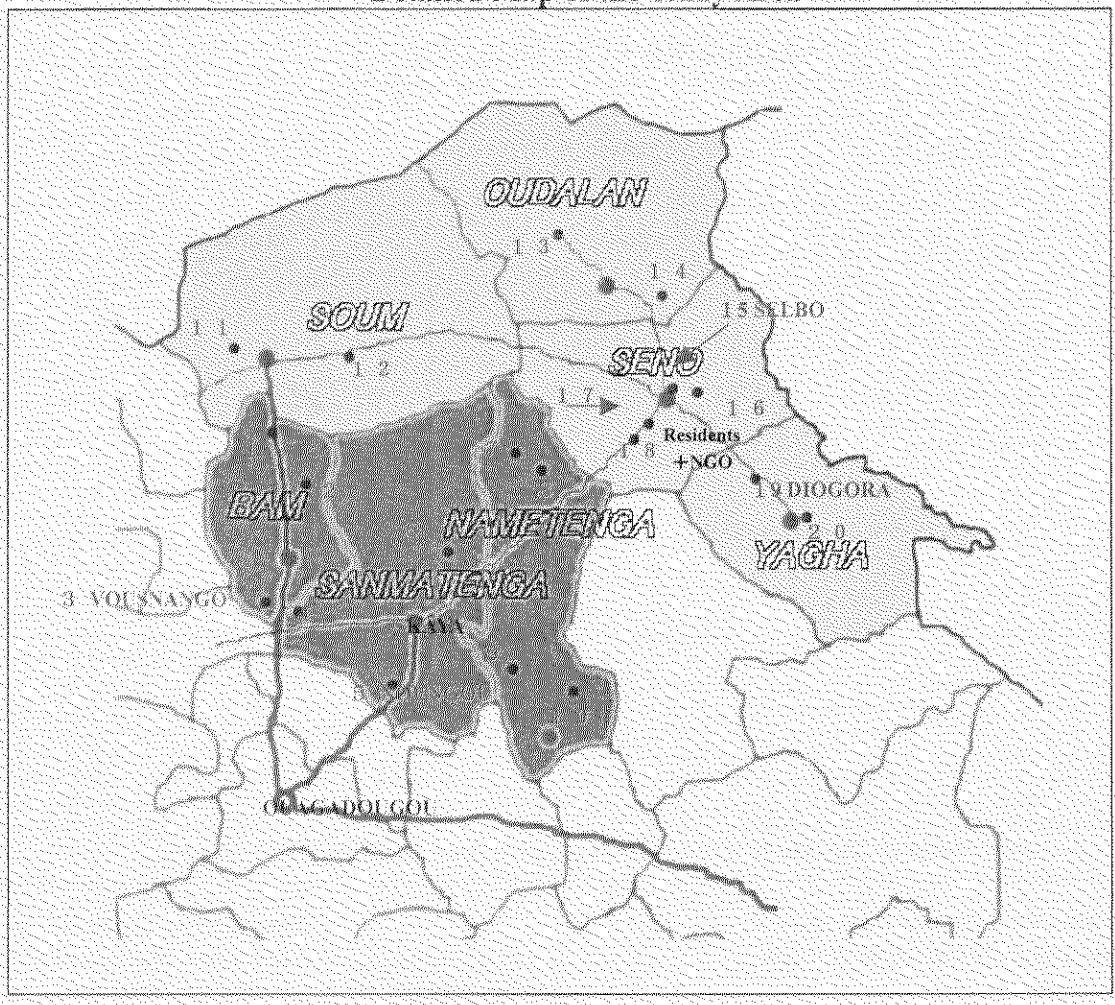
Location Map of the Study Area



Location Map of the Study Area (Sahel Region and Middle-North Region)



Detailed Map of the Study Area



: Road * : Village

Province	No.	Village (Villages covered by the Verification Project are underlined)
BAM	1	NAMSIGUIA
	2	MOMENE
	3	**VOUSNANGO**
SANMATENGA	4	SAORIZI
	5	**NOUNGOU**
	6	ROFENEGA
NAMENTENGA	7	BIRGUIN
	8	HORERE
	9	KOGONERE
	10	FALGUIN
SOUM	11	BORGUIENDE
	12	BELEHEDE
OUDALAN	13	PETOYE
	14	KORIZENA
SENO	15	**SELBO**
	16	BOUDOUNGUEL
	17	M'BAMGA
	18	GANGAOL
YAGHA	19	**DIOGORA**
	20	GUISSIGUIORI

List of Abbreviation

Abbreviation	(Anglaise ou Française etc./ English or French etc.)
ACORD	Association de Coopération et de Recherche pour le Développement
ADRA	Adventist Development and Relief Agency
ADRK	Association pour le Développement de la Région de Kaya
AED	Association Ecclésiastique de Développement
AGS	Action for Greening Sahel
AJACS	Association de Jeunesse d'Action de Coopération et de Solidarité
AMRT	Ateliers Mensuels de Revue Technique
AMURT	Ananda Marga Universal Relief Team
ANAR	Association Nationale d'Action Rurale
APESS	Association pour la Promotion de l'Elevage au Sahel et en Savane
ARSF	Antennes Régionales de Semences Forestières
AVD	Association des Volontaire pour le développement Environnement Auto promotion et Solidarité
AZAP	Agent de Zone d'Aménagement Pastoral
BAD	Banque Africaine de Développement
BHN	Basic Human Needs
BOAD	Banque Ouest Africaine de Développement
BSONG	Bureau de Suivi de ONG
BUNASOLS	Bureau National des Sols
CAF	Comité de Assignation du Fonds
CAP	Conseiller Agricole Polyvalent
CC	Cadre de Concertation
CCD	Convention des Nations Unies sur la lutte contre la Désertification
CCG	Commission de Commune des Gestion
CCR	Cellules de Concertation Régionales
CCTP	Cadre de Concentration Technique Provincial
CDC	Comité Départementale de Concertation
CDG	Comité Départementale de Gestion
CDH	Centre pour le Développement de l'Horticulture Cambreme au SENEGAL
CEBNF	Centre de l'Enseignement de Base et non formule
CECI	Centre Canadien d'Etude et de Coopération Internationale
CESAO	Centre d'Etude Economiques et Sociales d'Afrique Occidentale
CGT	Centre de Gestion et Technique
CIGVT	Commission Intre-Villageoise de Gestion des Terroirs
CLC	Comité Locaux de Concertation
CNSF	Centre National des Semences Forestières
CONAGESE	Counsil National pour la Gestion de l'Environnement
CONEDD	Conseil National pour l'Environnement et le Développement durable
COPOD	Comité de Pilotage des ONG sur la lutte contre la Désertification
CP	Comité de Pilotage
CPAF	Centre Permanent d'Alphabetisation Formation
CPAT	Commission Provinciale D'Amenagement du Territoire
CPCE/OP	Cadres Provinciaux de Concertation et d'Echange de Organisations Paysannes
CPG	Comité Provincial de Gestion
CPVP	Comité Provincial de Validation des Projets
CR	Commune rurale
CRA	Chambre Régionale d'Agriculture
CRC	Cellule Régionale de Concertation
CRVP	Comité Régional de Validation des Projets

Abbreviation	(Anglaise ou Française etc./ English or French etc.)
CRREA	Centre Régionaux de Recherche Environnementale et Agricole
CTI	Comité Technique Interministériel
CVGS	Comité Villageois de la Gestion de Site récupéré
CVGT	Commissions Villageoises de Gestion des Terroirs
DAEP	Direction de l'Approvisionnement en Eau Potable
DAF	Direction de l'administration et des Finances
DANIDA	Danish International Development Agency
DEP	Direction des Etudes et de la Planification
DFR	Direction de la Forestière Rurale
DGEF	Direction Générale des Eaux et des Forêts
DGEP	Direction Générale de l'Economie et de la Planification
DGH	Direction Générale de l'Hydraulique
DHA	Direction de l'Hydraulique Agricole
DIRH	Direction de l'Inventaire des Ressources Hydrauliques
DOPAIR	Direction de l'Organisation des Producteurs et de l'Appuiaux Institutions Rurales
DOS	Document d'Orientations Stratégiques
DPA	Direction Provinciale Agricole
DPAHRH	Direction Provinciale de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques
DPCLR	Direction de la Promotion Coopération et de la Législation Rurale
DPEBA	Direction Provinciale de l'Ensiegnement de Base et de l'Alphabétisation
DPEEF	Direction Provinciale de l'Environnement et des Eaux et Forêts
DPIA	Direction de la Production et des Industries Animales
DPRA	Direction Provinciale des Rescousses Animales
DPV	Direction des Productions Végétales
DRA	Direction Régionale de l'Agriculture
DRAHRH	Direction Régionale de l'Agriculture de l'Hydraulique et des Ressources Halieutiques
DRECV	Direction Régionale de l'Environnement et du Cadre de Vie
DREEF	Direction Régionale de l'Environnement et des Eaux et Forêt
DRED	Direction Régionale de l'Economie et du Développement
DREP	Direction Régionale de l'Economie et de la Planification
DRH	Direction des Ressources Humaines
DRRA	Direction Régionale des Ressources Animales
DVA	Direction de la Vulgarisation Agricole
DVTT	Direction de la Vulgarisation et des Transferts et Technologie
EMA	Equipe Mobile Appui
E/N	Exchange of Note
EP	Equipe Pluridisciplinaire
EU	Européen Union
EWW	Entreprise Works World wide
FAO	Food and Agriculture Organization
FEER	Fonds de l'Eau et de l'Equipement Rural
FENU	Fonds l'Equipement de Nations-Unies
FIDA	Fonds International de Développement Agricole
FND	Fonds National de lutte contre la Désertification
FNGN	Fédération Nationale des Groupe NAAM
FT	Projet Front de Terre / Ceinture Végétale
GRN/SP	Gestion des Ressource Naturelles /Secrétariat Permanent
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IBRD	International Bank for Reconstruction and Developement

Abbreviation	(Anglaise ou Française etc./ English or French etc.)
IDA	International Développment Association
IFAD	International Fund for Agricultural Development
IGB	Institut Géographe au Burkina Faso
INERA	Institut de l'Environnement et de Recherches Agricoles
INRAN	Institut National de Recherches Agronomiques du NIGER
IRSAT	Institut de Recherche en Science Appliquées et Technologies
J-Green(JGRC)	Japan Green Resourses Agency (Corporation)
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
LPDA	Lettre de Politique de Développement Agricole
LPDRD	Lettre de Politique de Développement Rural Décentralisé
M/M	Minutes of the Meeting
MA	Ministère de l'Agriculture
MAHRH	Ministère de l'Agriculture de l'Hydraulique et des Ressources Halieutiques
MARP	Méthode Active de Recherche et de Planification Participative
MBAM	Ministère de l'Enseignement de Base et de l'Alphabétisation
MECV	Ministère de l'Environnement et du Cadre de Vie
MED	Ministère de l'Economie et du Développement
MEE	Ministère de l'Environnement et de l'Eau
M/P	Master Program
MRA	Ministère des Ressources Animales
NGO	Non Governmental Organizations
OCADES	Organisation Catholique pour le Développement et la Solidarité
ODE	Office de Développement des Églises Evangéliques
OJT	On the job training
OP	Organisation Paysanne
PAN	Programme d'Action National
PANE	Programme d'Action National de l'Environnement
PANLCD	Programme d'Action Nationale de Lutte Contre Désertification
PAPEM	Point d'Appui des Essais Multi-locaux
PAPISE	Plan d'Actions et Programme d'Investissement du Secteur de l'Elevage
PAPNA	Projet de développement des Ressources Agro-pasatrales de la Province de Namentenga
PASA	Programme d'Ajustement Sectoriel Agricole
PATECORE	Projet d'Aménagement de Terroirs et de Conservation des Ressources dans le Plateau Central
P-EA/PFNL	Service Promotion des énergie alternatives et des Produits Forestiers Non Ligneux
PCM	Project Cycle Management
PDL/S	Programme de Développement Local du Sanmatenga
PDM	Project Design Matrix
PGFMR	Projet Gestion des Feux en Milieu Rural
PGRN	Programme Gestion Ressource Naturel
PISA	Programme d'Investissement du Secteur Agricole
PISE	Programme d'Investissement du Secteur de l'Elevage
PLA	Participatory Leaning and Action
PNAF	Programme National d'Aménagement des Forêts
PNDSA	Programme National de Développement des Service Agricoles
PNFV	Programme National de Foresterie Villageoise
PNGT	Programme National de Gestion des Terroirs
PNLCD	Programme National de lutte contre la Désertification

Abbreviation	(Anglaise ou Française etc./ English or French etc.)
PRA	Participatory Rural Appraisal
PRPR	Projet Réhabilitation des Pépinières Régionales
PS-CES/AGF	Programme Spécial de Conservation des Eaux et des Sols et d'Agroforestorie dans le Plateau Central
PSB	Programme Sahel Burkinabé
PSO	Plan Stratégique Opérationnel
PSSA	Programme Spécial pour la Sécurité Alimentaire
R/D	Record of Discussion
RAF	La loi portant Réorganisation Agraire et Foncière
RAV	Responsable Administratif Villageois
RECIF	Le Réseau de Communication d'Information et de Formation de Femmes
RNA	Régénération Naturelle Assistée
SAC/MR	Service d'Appui-Conseil aux Monde Rural
SAC/POPA	Service d'Appui-Conseil aux Producteurs et aux Organisations Professionnelles Agricoles
SDECV	Service Département aux de l'Environnement et de Cadre de Vie
SDEEF	Service Département aux de l'Environnement et des Eaux et Forêt
SG	Secrétaire Général
SP/CONAGESE	Secrétariat Permanent du Counsil National pour la Gestion de l'Environnement
SPS	Service Planification et Statistique
SPONG	Le Secrétariat Permanent des ONG
SPRA	Service Provincial des Ressources Animales
SRPPN	Service Restauration et Protection des Ressources Naturelles
SVTF	Service Vulgarisation des Techniques Forestières
S/W	Scope of Works
TAA	Taux d'Adaptation Absolu
TS	Technicien Spécialisé
UAA	Unité d'Animation Agricole
UAT	Unité d'Animation Technique
UBT	Unite de Betaie Toropical
UCADR	Unités de Coordination des actions de Développement Rural
UFC-DORI	Union Fraternelle des Croyants de DORI
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Program
UNSO	United Nations Sudan Sahelian Office
ZAP	Zone d'Aménagement Pastoral
ZAT	Zone d'Appui Technique
ZATA	Zone d'Appui Technique Agricole
ZATE	Zone d'Appui Technique en Elevage

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Summary

I. Introduction

【Background of the Study】

Burkina Faso has suffered severe damage from land degradation due to variable rainfall, population growth, soil erosion and soil degradation. In addition, as there is no system of local administrative organs, measures to alleviate land degradation through the support of residents have not been implemented adequately. In order to improve the above-mentioned situation, the government of Burkina Faso requested Japan to carry out a study to examine a system to promote measures for alleviating land degradation.

【Objectives of the Study】

The Study has the following objectives:

① To examine a system required to implement effectively the measures for alleviating land degradation in Burkina Faso and organize and propose it as the Program for the System to Alleviate the Land Degradation (M/P),

② To implement the human resource development and technology transfer by establishing the M/P.

【Study Area】

Central-Nort region and Sahel region of Burukina Faso.

Popuration 16.4 million., Land area 56,000 km^2, 7Provinces 54Cantons, 1269 Villages

II. Related National Programs

【National Programs】

Land degradation is advancing in Burkina Faso because of the numerous droughts over the past thirty years and the resulting soil degradation. This has also caused poverty, and the government of Burkina Faso has formulated a strategy to handle poverty. In this strategy, the government has declared the need for food security and environmental conservation as important issues. The government has formulated several national programs as guidelines for handling this kind of situation, such as the National Action Program to Alleviate Land Degradation, the National Action Program for the Environment, the Strategic Program for the Study of Agriculture, National Measures for the Agricultural and Stock Raising Industry, National Measures for Forests, and so on.

<National Action Program to Alleviate Land Degradation (PANLCD)>

The item especially related to this Study is following points should be noted.

① Transfer of responsibilities and power of decision relating to the management of natural resources through the promotion of a decentralization policy
② Strengthening of cooperation among government, NGOs and aid organizations
③ Reflection of the opinions of local residents in the measures
④ Utilization of the participatory method in formulating programs

<National Action Program for the Environment (PANE)>

PANE includes five programs: ① Terroir management, ② improvement of the living environment, ③ management of national property, ④ development of environmental qualifications, and ⑤ management of environmental information.

<Strategic Program for the Study of Agriculture (PSRA) >

PSRA was adopted in October 1995 with the aim of supporting the achievement of social and economic development goals to solve environmental problems. Its policy includes adequate recognition of the regional restrictions and potential of agriculture, the securing of food security and the alleviation of land degradation and poverty, taking into consideration better knowledge of the environment and appropriate methods for the sustainable management of resources (soil, water, plants and animals). It aims at relieving the effects of drought on agriculture and vegetation and ensuring the conservation and recovery of the soil.

<Adjustment Program for the Agricultural Sector (PASA) >

PASA is started as a related program of the aforementioned PANE with the support of the World Bank (IBRD: International Bank for Reconstruction and Development). PASA was formulated for the main purpose of: ① modernizing and diversifying production, ② developing food security, and ③ improving the management of natural resources.

<Strategic Guideline Document (DOS) >

A Strategic Guideline Document (DOS: Document d'Orientations Strategiques) has been established as the concrete objective of agricultural development for the promotion of PASA until 2010. The overall objective of DOS is to "continuously ensure agricultural production suited to the demands of residents while maintaining or improving their lives and the state of the environment". It lists the following concrete goals.

From these objectives, it can be seen that DOS is aimed at increasing agricultural production, activating the local market economy and promoting independent private activities.

<Strategic Action Plan (PSO) >

PSO establishes five priority programs and six individual plans with the aim of increasing the yield of cereals, niebe, root tubers, cotton, fruit, vegetables and oil producing plants DOS lists fertilization of the soil, nutrition and food security, modernization of agriculture, support for producers and producers organizations, and systematic support as priority programs.

The rural development strategy in the target area of this Study involves improving productivity by supporting stock raising and food security.

For this purpose, it must contribute to solving the problem of poverty in rural villages through recovery of the fertility of the soil by utilization of organic matter and conservation of water and earth as well as through measures for food security and diversification of cash income.

<Action Plan and Investment Program for the Stock-Raising Sector (PAPISE: Plan d'Actions et Programme d'Invetissement du Secteur de l'Elevage>

It is a program for the stock-raising sector, and which is based on the Ministry of Animal Resources approved a basic action plan consisting of the action plans; ①Improvement of indigenous cows and other livestock, ②Feeding and watering, ③Division of stock-raising area, ④ Livestock hygiene, ⑤ Improvement of pasture and securing of land, ⑥Finance and artificial resources.

<National Forestry Measures>

Recent plans have shifted towards resident-initiated plans that promote the participation of local residents from the planning stage, and continuously entrust responsibility for management of sylvicultural resources to local residents.

As programs related to the management of natural resources, including sylvicultural management, the National Program of Terroir Management (PNGT) etc. have been improved.

The National Village Forestry Program (PNFV: Programme National de Foresterir Villageoise), National Forest Management Program (PNAF: Programme National d'Amenagement des Forets), and Forest Energy Program have been formulated as sylvicultural management programs

【Decentralization】

With the support of the IMF and IBRD, the Government of Burkina Faso started a structural adjustment program .

Promotion of decentralization has the following merits: ① a closer relationship between the providers and the beneficiaries of administrative services, ② simplification and speeding up of administrative affairs and procedures, ③ provision of administrative services suited to local characteristics, ④ improvement of accountability by building a close relationship with the beneficiaries, and ⑤ improvement of local organizations.

However, in order to achieve these merits, it is necessary to enhance the coordinating and supervisory functions of each sector. This Study is closely related to the decentralization policy promoted by the Government of Burkina Faso.

【Ploblems for the National Program】

① Various measures and plans have been formulated, they have no financial support and lack staff. Therefore, they lack effectiveness.
② The shortage of personnels and budget for imlplementing decentralization.

III. Status of Administrative System

【Administrative Organization】

The major administrative agencies of Burkina Faso that are involved in activities at village level related to the program to alleviate land degradation include the Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), the Ministry of Animal Resources (MRA), the Ministry of Environment and Living Environment (MECV) and the Ministry of Economic Development (MED).

In most cases they work individually within each Ministry and few projects are implemented with cooperation between Ministries.

＜Provincial Technical Conference (CCTP)＞

The Provincial Governor is authorized to establish the Provisional Technical Conference (CCTP) as an agency to technically aid the Governor under the government ordinance relating to the application procedure of RAF (Law concerning Reorganization of Land and Agricultural Land). The main role of the CCTP is to assess the development project plans and coordinate the development projects within the Province. However, it cannot be said that the National Program is functioning well, because it is not easy to secure the funds necessary for such activities.

＜Provincial Committee of National Land Development (CPAT)＞

The RAF stipulates that a Committee of National Land Development shall be established at national, regional and provincial levels.

In the Sahel Region, a master plan at regional level has been formulated and the environment for assessing development projects has been improved. The Provincial Committee of National Land Development (CPAT) holds regular meetings to make assessments and approve development project plans and coordinate the projects. However, coordination of the projects involves checking whether the projects are inconsistent with or duplicate existing laws or regulations, the master plan for regional or provincial development, or any other preceding development projects, and is not directly involved in coordination at the stage of implementing the projects according to the project plans.

Membership of the CPAT at the provincial level consists of delegates from the provincial administrative agencies, mayors and national diet members elected in the region or province concerned. So the CPAT lacks speed in the decision-making process. Fund-raising is another problem. The CPAT is not yet established as a system for promoting communication and coordination among the related members at the project implementation stage.

＜Institute of Environment and Agricultural Research (INERA)＞

INERA is a national research institute that was established in 1988 to conduct research for the agricultural, pastoral and sylvicultural industries and natural resource management.
Its main duties are to conduct all research and development of agriculture, stock raising and sylviculture as well as the environment, to spread the R&D results and to conduct monitoring surveys, and also to foster human resources for these and to promote the sustainable management of natural

resources.

One of the present problems is that the techniques and cultivated varieties verified by INERA are difficult to introduce in rural areas where production takes place. The main cause of this problem lies in the closed nature of rural society and the promotion method, and especially in the inconsistency between the techniques being introduced and the needs in the field.

＜National Bureau of Soil (BUNASOLS)＞

Its main duties include creation of soil distribution maps, soil analysis and soil and water conservation activities.

The present activities undertaken by the institute are mainly concentrated on creation of soil distribution maps and soil analysis, and it has not conducted any soil or water conservation activities. In future, BUNASOLS will carry out research in cooperation with the Vegetation Production Department of the Ministry of Agriculture, Hydraulics and Haliuetic Resources or with INERA, into the total area of degraded/corroded soil and soil and water conservation programs and cultivation methods appropriate for the decreased farmland area resulting from the increase in degraded/corroded soil.

＜Promotional Systems＞

In the field of Agriculture, Extension and Guidance Section (SAC/MR) is in charge of promotion of agricultural techniques. SAC/MR comes under the control of the Provisional Office through the Educational Extension Chief and specialist technicians (TS) and provides support for agricultural technique extension and guidance to the technical support zones (ZAT) categorized by Canton and to the technical support units (UAT) for groups of villages

The TS consist of specialist technicians in four fields: ① soil conservation and recovery, ② fostering of rural organizations, ③ vegetable production and ④ food techniques. However, there are many zones and units that have vacancies due to a shortage of technicians.

The agents assigned to each ZAT or UAT are called ZAT or UAT leaders and they are engaged in support activities for extension and guidance of agricultural techniques to rural residents.

The ZAT leaders and the UAT leaders are incorporated into the hierarchical structure in this system, but in practice, due to the shortage of technicians, there are many cases in which ZAT leaders double as UAT leaders.

The departments and personnel engaged in the extension of stock raising are the Central Extension Department at national level, and the animal production specialist technicians (TS) assigned to the Provincial Offices and the leaders of stock-raising technical support zones (ZATE) in charge of Cantons at local level. As a rule, a veterinary group (PV) leader in charge of cattle hygiene is posted with the ZATE leader to each Canton, but in actual fact, in most cases one leader is posted to each Canton to serve as both ZATE leader and PV leader.

The department that administers and controls the extension services for forestry including reforestation activities is the Forestry Technique Extension Department (SVTF) organized within the Village

Forestry Department of the General Department of Water and Forestry under the Ministry of Environment and Living Environment. However, its responsibilities are not yet clear although one year has passed since its reorganization. In fact, the policies for extension are not specified in practical detail and the services are not defined yet. The residents recognize the forest agents as enforcement officials.

<Situation of Reduction for agents>

One agricultural agent controls about 5 to 20 villages, one forest agent about 30 villages, and one stock-raising agent about 20 to 40 villages.

At present, the number of agents is decreasing in the Ministry of Agriculture, Hydraulics and Halieutic Resources as a result of the structural reform program. The state of reduction is as follows:

【Problems for Administrative Organization】

① There are insufficient relationship between concerned Ministries which is the agricultural, stock-raising and sylvicultural sector.

② Agents are not fulfilling their role as contacts for residents because of problems such as the language used in extension activities and lack of personnel.

③ There are insufficient extension tools and the fuel necessary to run.

④ The agents has lack of recognition for administrative services against for residents.

⑤ The agents have not fully recognized how important it is for sustainable rural development to positively enlighten and organize residents. And the technical ability of the agents is unsatisfactory.

【Residents and Agricultural Organizations】

<Residents' Awareness and Ability>

The methodology of implementing these projects has changed in recent years from a top-down system to a bottom-up system based on the participation of residents. To demonstrate the effectiveness of projects in a sustainable manner using the bottom-up system, residents' awareness must be changed and their abilities enhanced with regard to the following points .

① Willingness to participate in development projects

② Approach to consensus building

③ Communication among residents

④ Facility management ability

<Regional Chamber of Agriculture>

The Regional Chamber of Agriculture (CRA) is aimed and planning to do following objectives.

① To transmit the intentions of producers to national and foreign aid projects and NGOs through a representative from each administrative division and to reflect the actual

conditions of the villages in agricultural policies and development activities.

② To actually participate in agricultural development and other projects as the agency representing the residents.

③ To play the role of a medium in technical extension by linking agents and producers.

【Problems for Residents and Agricultural Organizations】

① The residents has less awareness of active rural development.

② There is no mechanism for enabling smooth communication among residents or promoting consensus building.

③ The Regional Chambers of Agriculture has many uncertain factors at this moment regarding whether the CRA can function as originally intended in the light of problems such as funding of its activities.

【Project Implementation Systems of International Organizations】

Donors who are providing assistance over the long term are worried about how to implement their projects and are changing their methods of approach. The problems of the project implementation systems are summarized below.

① In an overview of the project implementation systems, the canton and village levels on the administration side, and especially the agents, are not in a position to bear responsibility for rural development, but are in charge of supporting technical issues and extending national policies. Support for residents is provided by animators employed by the project implementers.

② Since the project implementation systems are determined in accordance with the intentions of the aid organizations and the policies of the related Ministries, they have not been implemented systematically and in a consistent manner. Therefore, there has been a lack of mutual cooperative tie-ups in the agricultural, stock-raising and sylvicultural fields due to the vertical administrative system and there has been insufficient feedback from successful examples of preceding projects to ongoing projects.

③ Village Committees of Terroir Management (CVGT) were established at village level under the Joint Ministerial Ordinance proclaimed in February 2000, and many donors are bringing up the subject of CVGTs in their discussions with regard to their project activities. However, the literacy rate of the residents who make up the CVGTs is so low that donors are spending time on enlightenment activities and training courses to enhance residents' ability.

④ To continue these activities, the donor side has to cover all the costs including personnel expenses. No budgeting steps or measures to support such steps have been taken by the government.

【NGO】

The role of NGOs has shifted from their conventional function of extending the resources and services provided by governmental agencies and aid organizations widely to residents, toward support for independent rural development, and has further expanded to include the function of reconciling the interests of local residents in order to promote independent management and operation of resources, and supporting activities for enlightening and organizing residents. In practice, NGOs are involved in raising the level of local society and forming resident organizations by means of a participatory approach through various programs for human resources development, empowerment of women, literacy education and cereal banks.

【Problems for NGO】

① The financial shortage problems and insufficient cooperation between the administration and NGOs at regional level.

② The problems regarding independent development with respect to "sustainability" after the withdrawal of the project and "extensibility" to other regions.

③ The ploblems few experienced technicians capable of providing technical guidance in agriculture, stock raising and sylviculture.

IV Status and Use of Resources in Study Area

【Rural Society】

<Social system>

The basic social unit of production and consumption of the Mossi tribe is called a "Yiri".

The land belongs to the Yiri leader (usufructuary right) and farming is carried out on his instructions.

Traditional village organizations were abolished during the revolution, but Tenga (village) remained as a unit even after the revolution. The traditional village chief does not have any administrative power. The power of the traditional village chiefs was restricted, but even today they have the authority to lead the villagers.

The majour tribe insahel region Peul has no "landowner" system. They have no common fields like the Mossi and do not act as a group of families. Cereal cultivation is the work of the men who labor in the fields from morning till evening in the harvest season.
Peul are originally nomads. Their sense of economy is based on stock raising, and agriculture is secondary.
The village chief, "Terege" who is appointed by the governor of the canton has an administrative responsibility in both regions.

＜Women's position＞

The women play an important part in production activities and livelihood management, but they have no voice in society in that they have ① no right to make decisions on important matters in their homes or villages due to traditional customs; ② no right of land inheritance; and ③ no right to dispose of assets.
The family budget is controlled by men. Women cannot freely use the income earned through their agricultural and stock-raising activities, and such income is mainly used for family expenditures such as food and children's education.
In addition to their production activities, women are responsible for the household and childcare. In particular, the preparation of meals occupies the greater part of their working hours in a day because they have to grind millet with a mortar and pestle.
The task of drawing water also falls to women. It can take a great deal of time to draw water depending on the location of the water source.
Women play an important role in rural production activities and livelihood management and possess a lot of information on local resources, but many social and time restrictions are imposed on them. It is difficult for women to participate in activities and development for improving living standards.

【Land Use】

The Law concerning Reorganization of Land and Agricultural Land (RAF) stipulates that land is national property and, as a transitional measure for rural land, that "anyone using state-owned land for agriculture, stock raising or sylviculture at the time of proclamation may continue to use it". It was aimed at local management of natural resources.
However, 20 years have passed since the law was proclaimed, but Mossi society still does not abide by

it. The Government is making efforts to set up terroir management organizations in the villages, through which the villagers themselves can establish a natural resources management system for their village. However, the traditional system of Mossi society has not been completely abolished. An official in the Government of Burkina Faso has said that land system reforms must be promoted gradually.
In the Fulbe groups (Peul and Rimaibe blacksmiths etc.) in the Sahel Region, there is no "landowner" as in Mossi society. Today, land use is decided through mutual discussions in the CVGT.

【Agriculture】

The main crops are millet, maize, rice and fonio. Furthermore Niébé, Bambara nuts, yam, potato, cotton, peanuts, sesame and soybeans are cultivated as cash crops. In the Middle-North Region, furthermore cotton and soy beans are cultivated There are legular shortage of the amount of yields for the cereal supply, by the difficulties of insufficiency of demand for the region.

Residents of West Africa have little sense (awareness) of territory, and farmers also have little sense of weights, measures and area. This is a major obstacle to the diffusion of agricultural technology.

【Stock Raising】

The majour livestocks are cattle, sheep, goats, pigs, horses and fowl. Most of the livestocks are dominated by native breeds and improvement has not progressed

Grazing is the way of feeding cattle, goats and sheep. In the rainy season, this is limited grazing with someone on watch to prevent the livestock from damaging the farm products, and in the dry season unlimited grazing in the millet and sorghum fields after the crops have been harvested. This results in the ground being flattened under the pressure of the animals' hooves, reducing the porosity of the soil, with adverse consequences for the next crop, and aggravating surface runoff.

The excessive grazing caused by the imbalance between fodder production and the number of livestock constitutes a major factor in land degradation.

To stop excessive grazing, however, it is necessary to reform the consciousness of the residents who think of livestock as an asset, and it involves problems that cannot be solved simply through administrative guidance. The Ministry of Animal Resources and the Institute of Environment and Agricultural Research (INERA) aim to stop excessive grazing by recommending fattening by keeping livestock in sheds. This indirect method of fattening promotes artificial and natural selection (disposal by sale) of livestock, resulting in a reduction in excessive grazing. The production and utilization of compost using cattle dung and fodder residues available from raising livestock in sheds are promoted to prevent soil deterioration.

【Forest Resources】

The greater part of the Middle-North Region is included in the North-Sudanian zone, where the population density is high, as described previously, and intensive farming is conducted, which may tip the balance against weak vegetation. Once vegetation is lost due to excessive land development, it is

very difficult to recover..

In the north of the Sahel Region, soil deterioration has killed a number of tree varieties and the dead trees have resulted in a growing expanse of bare land. Plants are concentrated on low, undulating ground and perennial plants have decreased while annual plants have increased. Broadleaf trees with high evapotranspiration have decreased and narrow-leaf thorny tree varieties have increased.

In general, it is difficult to develop forestry for wood production as an industry in the Sahel Region. Even if seedling production is increased through establishment of nurseries as operation bases, there will be problems, such as the maintenance and operation of the nurseries and their distant location from the planting areas, resulting in poor reforestation activities.

【Water Source】

Except in the vicinity of large-scale bas-fond, groundwater is only available in a natural state in the rainy season (June to September). Ponds called "buri" have been dug in places, but most dry up in the latter half of the dry season. Therefore, residents have to rely on groundwater for a stable water supply throughout the year.

New surface water development for the purpose of securing domestic water is not very advantageous due to the fact that evapotranspiration is far higher than the yearly rainfall and there is no drastic way of preserving the water quality because livestock can approach easily.
If use is limited to agriculture, surface water development is an effective solution. One method involves drilling near a bas-fond, constructing a bank on the downstream side by piling up the surplus soil, and digging a hollow into which water is induced. Another method involves building a dam in the bas-fond to block the flow of water and accumulate the water in the dam. Both methods are effective in controlling the outflow of surplus surface water.

The groundwater level rises and falls depending on the rainfall, but there are no reports of the groundwater level falling year by year. The amount of water used at present does not exceed the recharge from upstream in most cases and is therefore sustainable. In other words, the groundwater level in the deep layer is stabilized regardless of seasonal changes, and the quality is much better than the surface water or groundwater in the shallow layer.

There are two ways of securing a stable supply of deep groundwater.

① A large-diameter well is dug in relatively low ground such as a bas-fond. Drilling is continued until an adequate water level is secured even in the dry season.

② A borehole is dug and equipped with a pump. This method requires that residents are able to provide sufficient finance and labor for maintenance and that they have access to a reliable maintenance company.

V. Impeding Factors to Alleviation of Land Degradation and Countermeasures

【Impeding Factors and ploblems】

Land degradation is attributable mainly to human factors such as exploitative agriculture and stock raising exceeding the productivity levels of land and vegetation than to the natural factors such as decrease in rainfall. This Study aims at establishing a system for promoting countermeasures against land degradation by allowing residents living on the frontline of land degradation to achieve a higher productivity in agriculture and stock raising, This would allow them converting their lifestyle from an exploitative to a sustainable type.

The impeding factors to promotion of measures to alleviate land degradation in the Study Area can be broadly classified into problems relating to the support system for residents, who are the implementers of the measures, and technical problems in implementing rural development.

The setting up of Terroir Management Village Committees (CVGT) is established by law as a means of managing the natural resources that exist in the Terroir with the voluntary participation of local residents in order to sustain the development of the village. Donors have adopted this participatory-type method centered on CVGTs. The effectiveness of this method is demonstrated by the past activities of donors.

However, for the impeding factors in promotion systems, various frameworks have been tried but no unanimous solution has been found yet. The task to be undertaken in the future is to develop a system that allows residents themselves using the technologies established for rural development to promote countermeasures against land degradation.

【Ploblems on residents supporting systems】

The problems and eeasures on residents supporting systems are summarized below.

Category	Impeding factors	Measures
Problems Relating to Mainly the Agents and Extension System	Shortage of agents	Shortage of agents Cutback of agents is national policy in line with structural adjustment program and solution of shortage is difficult. Therefore, framework for supplementing activities of agents is established.
	Lack of technical ability of agents	Creation of opportunities to acquire skills, such as technical training courses
	Communication between agents and residents	Framework for supplementing activities of agents
		Acquisition of participatory-type development method
	Insufficient educational capabilities	Creation of opportunities to acquire skills, such as technical training courses
		Acquisition of participatory-type development method
	Lack of extension materials	Development and extension of teaching materials
	Lack of means of transportation	Framework for supplementing activities of agents
Problems Relating to Mainly the Administrative Organizations	Lack of cooperation among sectors	Establishment of extension system with cooperation of agricultural, stock raising and sylvicultural sectors
	No contacts for resident support	Establishment of contacts for resident support
	Lack of awareness of present conditions	Establishment of framework for supplementing administration
		Introduction of participatory-type development
	Lack of project implementation supervisory system	Accumulation and systematization of know-how on project implementation
	Shift away from administration-initiated activities	Introduction of participatory-type development
Abilities etc. to be expected to the Residents	Reform of approach to participation	Enlightenment through participatory-type survey method
	Consensus-building capability	Organizing of residents
	Communication among residents	Literacy education
	Operation and management ability of facilities	Improvement of ability by OJT through project implementation

VI. Program for the System to Alleviate Land Degradation (M/P)

【Basic Concept of M/P】

The basic concept underlying formulation of the M/P is to implement measures for the alleviation of land degradation through sustainable production activities in agriculture, stock raising and sylviculture.

① Promoting voluntary participation of residents
② Promoting alleviation of the land degradation through sustainable production activities of agriculture, stock raising and sylviculture
③ Making the most of the current administrative organizations and systems of the Government of Burkina Faso and the capabilities of the NGOs in the country
④ Allowing residents, administrative organizations, and assisting organizations to cooperate with each other methodically

【Formulation of M/P 】

The following framework is proposed for the M/P: ① to strengthen cooperation with and improve the abilities of administrative officials and agents, ② to promote cooperation between the administration and research and study institutions, and ③ to cooperate with NGOs that supplement the functions of the administration.

More concretely, the M/P consists of the following four elements.

① Establishment of village development councils
② Implementation of technical exchange meetings
③ Implementation of a program to improve the abilities of the administration
④ Improvement of the support tools (teaching aids, etc.) used by administration officials, agents and residents

A verification study shall be implemented during the period of this Study to confirm the effectiveness of the proposed framework. Furthermore, part of the M/P shall be implemented by on-the-job training (OJT) through implementation of the verification study.

【System Aspired to in the M/P (Village Development Council) 】

From the viewpoint of ripple effects (deployment across areas), a project must be implemented on the initiative of residents. A framework should be also provided to ① indirectly support the efforts of residents and ② announce and introduce the results to other villages. The M/P does not target specific villages, but proposes establishing a framework with an administrative organ governing the cantons, to which multiple villages belong, at the center (Rural Development Council).

This framework is closely related to the study of the present state of the regions, organization of residents, formulation of projects, and each process of implementation, monitoring and evaluation of the project. Therefore, the framework must be a permanent organization extending from national program level to direct resident support level. For this reason, the framework shall provide the

following: ① cooperation among ministries and government offices, ② cooperation between the administration and resident organizations, and ③ supplementation of the abilities and functions which the administration lacks.

VII. Outline of the Verification Study

【The M/P and the Verification Study】

We summarizied and proposed as the M/P those measures for alleviating the problems in administration, agents, extension systems, etc. for the support of residents. This done, we implemented the experimentally study in order to verify the effectiveness of the M/P, according to the items proposed. Through the experimentally study we did the activities; ① Project implementation management training (Seminars on the Existing Projects), ② Technical Exchange Meetings, and ③ Participatory-type development method training.

At the sametime, we established the Rural Development Activity Coordination Unit as an organization/activity to serve as a starting point for a Rural Development Council to the improvement of the resident support systems.

Additionally, operation manuals and technical materials were created to provide support tools.

【Selection of candidate villages】

As part of the Verification Study to confirm the effectiveness of the M/P, training sessions and workshops have been held and verification projects implemented to verify mastery of the technologies and cooperative activities acquired therein

In order to make understanding of general condition, the 20 villages selected as target villages for the study of natural resources/ socioeconomic situation, nine villages were selected as candidate villages for the verification project. The candidate villages for the verification project were defined as those representative of the region in terms of ethnic makeup, employment and economic conditions, population, etc.

The villages were selected with particular attention to accessibility so that in-depth monitoring could be conducted and so that the implementation of the project would have a demonstrative effect and a ripple effect.

Consideration was given to the final selection of the target, since the project involved the organization of the residents, each of the villages was to have a population below 3,000.

These nine villages were then evaluated as target villages for the verification project on the basis of the results of the field hearing study and regional resources study.

In evaluating the candidate villages for the verification project consideration was given to the villagers' ①desire for development, ②cooperativeness, ③accessbility, ④possibility of water resources development, ⑤history of assistance.
Following table shows the social conditions of the four villages selected.

Items	Vousnango Village	Noungou Village	Selbo Village	Diogora Village
Population	1,863	1,038	2,694	411
Number of hamlets	7	7	5	1
Ethnic group	Mossi, Peul	Mossi, Peul	Rimaïbe, Peul	Rimaïbe
Religion	Animism Islam	Islam, Animism, Christianity	Islam	Islam
Residents' organization	11	8	2	5
Main farm products	Millet, Sorghum	Millet, Sorghum, Maize	Millet, Sorghum, Maize	Sorghum
Number of community halls	2	1	0	0
History of assistance	Yes	Yes	Yes	No
Participation of agricultural agent	Once a week	Once a year	Once a week	Irregular

【Workshop on Promoting Cooperation】

In the first workshop, problems were summed up through the PCM method by the agents themselves. Analysed by region, the results indicated that the main problems or causes were such direct items as the hardships of life in the Sahel Region and such more general items as the degradation of natural resources in the North Central Region. In the Sahel Region, the degradation of natural resources had advanced to such a degree that it threatened the life of villagers. In the North Central Region, on the other hand, the villagers were experiencing the decrease of natural resources that were once available, although their life is not as hard as in the Sahel Region.

As the analysis advanced, it turned out that, despite the difference in the specified main problems, all the problems were interrelated across the sectors of agriculture, stock raising, and sylviculture, and the direct causes were there because the extension technologies of these sectors had not penetrated through to the residents and had failed to yield results

In the second workshop, we did the analysis of those involved to the activities of extension activities and problem analysis for extension system.

The analysis of those involved found common causes across the sectors. Unlike in the first workshop, there was no big difference in the analysis results between the regions. The analysis results seem to indicate problems common to the entire Study Area, rather than problems unique to the villages targeted in the verification project and the cantons in question.

Therefore, the analysis results indicate the measures to be taken in the improvement of the systems for the promotion of land degradation alleviation. It has been pointed out, for example, that the reason "the results of extension do not spread" is that "the extension technologies are not appropriate for the village" or "the agents do not recognize the problems of extension (in the village)." This is one indication that the agents and other staff do not grasp the requirements of the residents.

In the third workshop, we made analysis on the division of roles and cooperation between the mediators in a development project. As this result many participants gained new perceptions.

Through the basic development plan (draft) which NGOs provided support for creating, for example, many participants recognized the lack of joint efforts between administrative organizations and NGOs in the past and reconfirmed the importance of cooperation. Furthermore, some participants said that they came to understand which actor (concerned person) should have which role and participate in what kind of cooperation.

On the other hand, some people said that, considering the present conditions of the area, they have doubts about the feasibility of discussed division of roles and cooperation methods and that they need to be revised.

The following workshops to the fourth, those workshops were held for the opportunity of examination to the activity policies and summarization of the activities for the Unit.

【Rural Development Activity Coordination Unit】

Initially ie. in the early stage of the third study in Burkina as a beginning of the activity of unit, there was some confusion due to a lack of understanding of the aim of its activities and the expectation of financial support from the Study Team. After more meetings were held, the verification project made progress and specific activities were carried out in the village, the Unit began to serve as a platform for the CVGT, agents and NGOs to exchange information for the smooth implementation of the verification project. Further, inaddition to project implementation, the Unit began to assume the role of a liaison point between the residents and the administrationso that the CVGT, for example, would ask for the advice of the administration and NGOs regarding matters related to rural development, such as proper management of natural resources in the village and the rules for shared use of resources with neighboring villages.

The operation of Unit activities, content of discussion and level of support provided to the residents vary depending on the Unit. This is unavoidable to a certain degree because the framework of the Unit largely depends on such personal elements as the qualifications, technical capabilities, experiences, and personalities of its members.

However, the administrative offices and agents can carry out only a limited range of activities because of budget restrictions, while the NGOs, basically carrying out activities within the scope of contracts in the Study, can respond to only a limited range of requests and suggestions from the residents. On the other hand, with the trend towards decentralization and it is not yet clear what kind of support the adminiastration will provide for the policy of making the CVGT a unit of rural development.

For this reason, the attitude of the administrative side is passive when the discussions are made on the agreement with the nearby villages for the management of natural resources or for the formulation of regulations to conserve the resources in the village. More concretely, when the CVGT formulates a draft of agreement, the administrative side takes the attitude that it examines the validity of the draft by referencing to the existing laws or plans and advises by making correction and so on as necessary. In the case of legal regulation, the administrative side should primarily indicate the rough framework and the detail regulations should be determined by the discretion of the CVGT within the indicated scope. However, it can be analyzed that the smallest administrative units not knowing the clarified

roles they should play are malfunctioning when the bottom-up approach mainly consisting of decentralization and CVGT is developing.

The framework of the rural development council proposed by this Study is considered to contribute to the strengthening of functions.

【Seminar on Existing Projects】

The Seminar on the Existing Projects was held in October 2002 for the first time and in August 2003 for the second time.

The First Seminar on Existing Projects selected for consideration the Special Agroforestry Program for Soil and Water Conservation at Central Plateau (Programme Special de Conservation des Eaux et des Sols et d'Agroforestorie dans le Plateau Central: PS-CES/AGF) in which the agriculture, stock raising, and sylviculture agents and NGOs cooperate with each other in comprehensive development of the village. This seminar was held as a fact-finding visit to the village in which the PS-CES/AGF is active.
PS-CES/AGF has a project implementation system in which the Department of Agriculture, Hydraulics and Halieutic Resources, Environment and Living Environment Ministry, Ministry of Animal Resources, Ministry of Middle and High Education and Scientific Research, and NGOs implement rural development projects in cooperation, with a clear definition of their roles.
From the answers to the questionnaire given to the participants, it was verified that they learned many things in this Seminar. In particular, they found it informative to learn about the residents' participation in the establishment of the basic development plan, the effectiveness of water recharge through the installation of infiltration weirs, stone lines and zai, technologies to combat soil erosion, and the presence of an elementary school constructed through the spontaneous participation of the residents. On the other hand, the lack of themes related to stock raising and natural resources management was pointed out, mainly by the stock raising agents.
Further, it was pointed out that, although the activities by teams across multiple sectors were effective, no cooperation between the agriculture and stock raising sectors was found.

Second seminar was held to consider better extension systems, at the two sites under the National Program of Agricultural Service Development, Phase II (Programme National de Developpement des Services Agricoles II: PNDSA II) being implemented in the Sanmatenga Province
PNDSA II had the following problems: ① The program was being implemented in a top-down approach so that the extension activities did not meet the needs of the residents, ② The agents were not providing sufficient education activities for the residents, and ③ The extension activities could not be carried out effectively, mainly due to the low literacy rate of the residents. In the extended period of PNDSA II (1.5 years from 2002), therefore, the private sector, such as NGOs, was incorporated into the operation of the project, and the resident organizations themselves were allowed to select a subproject. However, PNDSA II still has many problems, being limited to the enhancement of software related to the education and training for agriculture and stock raising production and support for the establishment and operation of resident organizations.

The Seminar on Existing Projects had the participants gather in one place and go on a fact-finding visit to one project so that they could recognize and examine the contents, problems and effectiveness of the project. Because of the insufficient number of meetings due to time limitations and problems of

expense, the objective of the Seminar was not achieved in a sufficient way with regard to role division and method of cooperation among those concerned.
It seems effective, for example, to incorporate fact-finding visits to advanced areas in the daily Unit activities and thus learn about the existing projects.

【Technical Exchange Seminar】

The experiment and research organization selected their research themes for themselves, and consequently the selected themes did not necessarily meet the needs of those in the field. The extension activity themes were NOT selected as a result of investigating and summarizing the requests of the farmers and finally adopting the result.

On the basis of an awareness of these problems, the Technical Exchange Meeting was held to provide an opportunity for the Institute of Environment and Agricultural Research (Institut de l'Environnement et de Recherches Agricoles: INERA), the National Bureau of Soil (Bureau National des Sols: BUNASOLS), the National Forest Seeds Centre (Centre National des Semences Forestieres: CNSF) and the administrative officials, agents, etc., in the Study Area to improve their technical capabilities and to strengthen cooperation in extension through the exchange of technical information.

Many of the administrative officials expressed the opinion that they would like there to be more exchange meetings, but INERA, BUNASOLS, and CNSF, while admitting that the exchange of opinions with agents, etc. was important, had a more passive attitude to the exchange meetings mainly because of the cost problems.

With regard to such matters as the distribution of research findings other than those released, photos and digital data, direct guidance to the agents, etc., and the opening up of test fields, , the organizations explained the situation they were in, and raised the problem of expenses.

The implementation of Technical Exchange Meeting allowed the participants to confirm the necessity and effectiveness of incorporating INERA, BUNASOLS, and CNSF into the system to alleviate land degradation. At the same time, in order to construct a system that will continue even after the end of the cooperation programs in this Study, it is necessary to promote the building of consensus between those concerned, including the central government, through study activities.

When the agriculture agents, stock raising agents and forest agents came together in one place and were given an explanation of technologies related to agriculture, stock raising, and sylviculture, the agents. had the chance to hear an explanation on the theory of technologies outside of their own specialty sectors. Although the agents, etc. had attended several cooperation promotion workshops held before this Exchange Meeting and were already acquainted with each other, the theme of these workshops had leant heavily towards administrative matters. Therefore, this Exchange Meeting provided a good opportunity to strengthen a common technical awareness between the agents.

【Training in Participatory-type Development Methods】

Previously, the agents served as a mobile unit promoting national strategies. Currently, however, they are required to have for the capacity, in the framework of activities based on national policies and project support, to not simply give the residents what they need but to empower them so that the residents themselves are able to continue the activities.

Thus, the agents are required to have the ability to facilitate rural development for the residents . On the other hand, they see themselves as a mobile unit promoting national strategies. When the latter perception is strong, the agents direct, rather than facilitate, the residents' activities in the negotiations; The activities are then not directly relevant to the interests of the residents nor do they attain immediate results. In such a case, the activities would cease before the effects manifest themselves. The training sessions so far emphasized the perception that resident participation was necessary in a series of processes for rural development, but lacked a viewpoint on evaluation. In the future, the training participants need to recognize that a program for participatory type development presupposes participatory-type evaluation, which must be systematically incorporated into the program.

There was also a problem in the education and capability improvement of residents and future leaders of local government. The training sessions so far led the agents to believe that simply learning how to use and using the PRA/MARP equipment and tools will bring about participatory-type development. While, ideally, the agents should be able to spread the concept of resident participation to the residents, many of the agents have not clearly understood them yet.

It is necessary to define the role of agents; whether they need to facilitate the residents as animators, or provide only technical guidance as an administrative service. It might be even said that, from the observations made in the training sessions so far, the average agent does not have the capabilities required to take on the task of rural development. Although about 10% of the agents do have such capabilities, the agents on the whole have widely differing levels of education, are lacking in consideration for the weak (gender consideration), and have a low level of problem awareness. In a sense, the agents are no different from the residents. Another problem is that, when an agent is relocated to an area where he does not speak the local language, he is not be able to help the residents. Therefore, it is deemed effective to have educational activities and support for the creation of development plans provided to the residents by community-based NGOs, rather than the agents, in the local language.

【Seminar on the Influence on Nearby Villages】

The eighth regular meeting of the Rural Development Activity Coordination Unit was held in the target villages for the verification project as the Seminar on the Influence on nearby Villages, mainly to ① summarize the activities of the Unit and make them widely known to the residents and ② introduce the effects of the Verification Study to the surrounding villages and allow the target villages for the verification project and the surrounding villages to learn from each other.

The special remarks for each village are as follows:

＜Vounsnango Village＞

Nine persons from the five nearby villages (Yaoghin, Raka, Nianguela, Wattinuma, Bokin, and Pitenga) and about 60 villagers participated.
The participants from the surrounding villages were outgoing in asking questions on how the project was implemented.

During the preparation for prizes for excellent farmers, the Provincial Agricultural Office Chief showed ingenuity by utilizing the subsidy system of the Ministry of Agriculture to procure agricultural tools. This is a commendable example of resident-support measures spontaneously devised by the Unit.

＜Noungou Village＞
The presentations by the villagers weighed too heavily on the content of the support from the Study Team and NGOs, and were filled with requests for the continuation of support. The villagers' preoccupation with the continuation of support was strongly criticised by the canton governor and agents.
The Korsimoro Unit in charge of Noungou was most sluggish in its activities in terms of cooperation between the agents and NGOs and a support system friendly to the residents, because of the long absence of the provincial office chief and the small number of project items to be implemented. Even in the Seminar to summarize the activities, no specific advice was given by the agents and NGOs to the problems encountered by the residents in the implementation of the project.

＜Selbo Village＞
Since people were invited from the neighboring villages that share the pastures with Selbo, they were forward in asking questions mainly on the management of pastures, construction of transhumance roads, and coordination between agriculture and stock raising, which were answered accurately mainly by the CVGT subcommittees.
The Seminar was the most effective in view of the objective of introducing the content of the verification project to the nearby villages.

＜Diogora Village＞
The presentations made by each of the subcommittees in turn dealt from start to finish with the content of support provided in the Study and requests to continue the support. The people from the nearby villages did not make any noteworthy comments except to request the same kind of support. This is an unavoidable result in Diogora, where education to raise the residents' perception of development has been lacking .
In his summary, the provincial office chief made the commendable comment that the significance of the Seminar was to communicate the experiences of the village to other villages, and that the villagers' preoccupation with the continuation of support needed improvement.
Each of the speakers from the subcommittees, being unaccustomed to this kind of meeting, often faltered in their presentations but each time, the chairman gave supplementary explanations. It is also a commendable effect of this Study that the chairman, who at the first regular meeting of the Unit had seemed unreliable as the representative of the village, had become accustomed to meetings after six months' experience, and was able to assist other villagers.

【Verification Project】

The observations made in these verification projects were as follows:

＜Perception of Participatory-Type Development＞

When the verification study supported the establishment of CVGT and formulated the basic development plan, the activity plan was formulated with the participation of the residents. However the contents of the activity plan were assuming the supports of the study and the plan listed the items only. While saying residents have powers of decision in rural development plans implemented as participatory-type "projects", in fact often residents just express their opinions and "participate in the framework of plans prepared by external supporters."

Originally, the "participatory-type approach" is NOT a way of creating an activity plan or participating in operation that presupposes the implementation of a project, but a way of pursuing decision-making to improve the living conditions of the residents themselves. It will take some time for the external supporters and the village residents, who are the main implementers, to truly understand the idea of participatory-type development (that the residents themselves should participate in day-to-day activities for resolving problems) as it requires training through Participatory Learning and Action (PLA).

＜Approach to Gender Considerations＞

The residents and people involved are being educated to be aware of equal opportunities for the weak and for men and women when implementing a project. In some villages the CVGT resident organizations only have one female member.

Representatives of the resident organizations answered that they realized that not enough women were participating, but in reality, they could not force the women to participate and that the problem lay with the awareness of the women themselves. Measures were being taken, such as giving separate literacy education classes for men and women, and separating men, women and youths in meetings to make it easier for them to speak up. Such activities etc. are educating the residents and improving the situation. However, it will take time for the residents to be able to give consideration to gender.

＜Division of Roles Between Those Involved＞

The NGOs that implement projects through contracts come into contact with many residents through their support for residents' activities. Agents, on the other hand, come into contact with and provide technical advice to residents only about once a month in the course of their regular duties. Therefore, agents do not really facilitate rural development for residents, and the residents, in turn, do not depend on them.

What the residents need is for the chance to use the services to be available to everyone. It is necessary for the agents, administrative services and NGOs to clearly define what can be done.

＜Educational Activities＞

To make the land degradation alleviation activities sustainable, it is essential for the residents to understand the activities. It was then found that, if the animators have abundant experience and successfully promote educational activities for the residents, organizations can be formed smoothly even in villages that have never experienced CVGT activities, causing the residents themselves to carry out spontaneous activities.

These activities are also required to enhance the sense of participation among residents and motivate them.
However, these activities are carried out by animators such as NGOs. It is not clear whether the agents have such capabilities and discussions are necessary before they can be required to perform such roles.

＜Importance of Literacy＞
Some of the CVGT representatives lack adequate proficiency in literacy. It was discovered, however, that communication between the unit and the CVGT is possible if the representatives are always accompanied by a literate CVGT secretary. Selbo village had the bitter experience of commissioning operation of the cereal bank to an outsider, who embezzled the funds, causing the cereal bank to collapse. The village worked on the establishment of a new cereal bank in this verification project. Learning from past failure, the CVGT is considering launching its own literacy class in the village with support from an NGO. These two points show that the residents learned through the verification project that literacy is essential to all their activities.

【Outcome Evaluation】
The results of the verification study were assessed on "how the activities in the verification study contributed as a whole to the solution to the impeding factors against the program to alleviate the land degradation". In practice, it was necessary to monitor and assess how the system of supporting the residents was improved through the activities (including the Rural Development Activity Coordination Units, Technical Exchange Meetings and training for the preparatory type development method) in the verification study that was implemented to reinforce ① the tie-ups between administrative officials and agents and the improvement of their ability; ② the tie-ups between the administration and experiment and research organizations; and ③ the tie-ups between the administration and NGOs to complement the administration's functionality. In other words, not only the output of each of the activities but also the outcome of all the activities as a whole was monitored.

The monitoring and assessment was made in the following 4 methods:

① The residents assessed whether the system of supporting them was improved or not.
② The agents and administrative officials made the self-assessment on whether the tie-ups between them necessary to support the residents were reinforced or whether their ability of supporting the residents was improved.
③ NGOs assessed on whether their tie-ups with agents were successful or not.
④ The reports on the activities that were made to Governors of Cantons were reconfirmed with the Governors and assessed from the viewpoint of coordination with the concerned with these activities.

＜Evaluation result＞
The average score was 1.7 to 2.0. The resident support system by the study seemed to be improved and the effects of the study were manifested. However the evaluation indicates that the improvement was not sufficient and the continuous activities to improve the resident support system are necessary.

The outline of the result for each index is shown as follows. The fact that the evaluation result for each index did not vary much just like the evaluation by the residents was symbolic could be

considered that the standard was not established to properly indicate the results numerically.

<Viewpoint of Residents>

The residents answered that the agents were certainly visiting the villages more often than before, but this was only to be expected because the agents needed to visit the villages in order to implement the verification project and were given the incentive of fuel expenses through the Study. However, the agriculture, stock-raising and sylviculture agents were expected to provide support to the residents through cooperation across sector borders, but this goal was not attained.

At present, the agents basically carry out activities in their respective sectors and the residents select the agents depending on the nature of the problem when they request a solution.

However, the framework in which the agents and NGOs cooperate in supporting village development is an effective framework that reduces the distance between the residents and the administration and agents, directly conveys the residents' requests to the administrative officials, etc., and feeds back the examination results to the village.

All the CVGT representatives welcome it as a major change that the administrative officials, agents and NGOs discuss village development in the regular meetings of the unit and coordinate their activities. The residents began to speak up freely at the regular meetings as more meetings were held. Although the system for organizing regular meetings varies from village to village, some villages coordinate opinions at a villagers-only meeting held in advance and express them at a regular meeting and others feed back information through the CVGT subcommittees after a regular meeting. While previously it was difficult to convey the opinions of villagers to the administration, it became easier to do so after the Study. Therefore, the villagers highly evaluate the unit as a framework connecting them to the administration.

<Evaluation by NGOs>

The NGOs were interviewed for their opinions mainly on cooperation with the administration or agents including the unit, improvement in the capabilities of the agents through the Study, and the agents' understanding of the bottom-up approach. The results varied depending on the evaluator. Furthermore, the evaluations did not necessarily agree with those of the Study Team on unit operation.

This seems to have resulted from differences in the technical capabilities of the evaluator or NGO to which the evaluator belonged, past experience of cooperation with the administration, and the sectors to which the verification project was related.

The NGOs, each implementing the project in cooperation with the agents as part of the Study, answered that they were able to carry out some of the activities, such as the explanations for the residents and ascertainment of the local situation, efficiently through cooperation with the agents, but that, generally, cooperation with the agents was not absolutely essential and the project could be adequately implemented by the NGOs alone.

On the other hand, mention was made of cases in which, when more than one NGO carries out activities in one village, lack of sufficient coordination between the NGOs leads to problems, and the usefulness of the unit as a framework for liaison and coordination between the parties involved was

pointed out.

The agents carried out technical extension on specific themes according to the extension programs formulated by the national government. Since many of the government-led development programs in the past did not elicit resident participation, efforts are being made to switch to a resident-led bottom-up approach. However, the NGOs that cooperated with agents concluded that it will take a considerable amount of time for the agents to reform their perceptions.

Furthermore, they also pointed out that the inability to speak Peul in the Sahel Region constituted an obstacle to extension activities and that frequent relocation of agents hindered cultivation of human resources through the Study.

While CCTP, a provincial-level council, did not function, the unit, which was only part of the Study activities, functioned well as an opportunity for cooperation between the administration and NGOs. The framework in which the provincial office chief was assigned the central position in the unit was highly evaluated as an attempt to ensure continuity. The NGOs thought that, in the future, it would be necessary to phase out the intervention of the Study Team in order to establish an independent resident support system.

<Evaluation by Canton Governors>

In the Middle-North Region, the canton governors received minimal information on the Study and showed a high interest in the Study. The unit was highly evaluated as an effective framework to convey the opinions of the CVGT to the administration.

In the Sahel Region, in contrast, the canton governor received insufficient information from the unit members, including the provincial office chiefs and ZAT chiefs, and only knew the fact that the Study was in progress.

Although it is stipulated in the government ordinance that "the canton governor shall coordinate and supervise the administrative organizations in other sectors in the canton," it seems that in reality decentralization of authority is not functioning adequately.

Furthermore, opinion is divided on participation in the unit, as to whether the canton governor should be a permanent member, or whether it is sufficient to provide him with information as required. Considering that the canton office is staffed by only about three persons, it seems more realistic for the unit to regularly provide information.

However, it is also pointed out that since the provincial office chief is not authorized to summon the staff of other ministries, it is preferable for the canton governor to be responsible for unit operation according to the stipulation in the aforementioned governmental ordinance.

<Summary by Study Team>

Considering the administration's financial power, mobility, and technical capabilities such as the participatory-type development approach found in educational activities, training, etc., it seems realistic to assign the central role of rural development to the NGOs, provide project support under the management of the administration, and have the agents assist the administrative officials including the

provincial office chiefs by collecting information in the villages and providing administrative guidance to the residents and technical guidance support according to the extension programs formulated by the government (such as pest control and vaccinations).

Furthermore, it is necessary to assess the progress of the decentralization policies promoted by the Government of Burkina Faso and accordingly propose the promotion of cooperation between the provincial governor, canton governor and technical administrative organizations.

【External Evaluation】

The results obtained from these are outlined below.

- The Rural Development Council is effective. For it to function adequately, however, it is necessary to define the chain of command and take budgetary measures.
- The cooperative relationship with the related Ministries and the involvement of the Governor of each Canton in the Rural Development Council are still open to further discussions.
- This Study is consistent with the development policies of the Government of Burkina Faso. But it is still difficult and premature to evaluate the effects etc..
- The parties concerned are beginning to develop a different perception of participatory-type development. However the agents need on-the-job training to master participatory-type development.

VIII. M/P Reflecting the Verification Study Results

【Verification Study Items to be Reflected on M/P】

Seven items which should be reflected on the M/P as summarized as follows:

- The planning and supervision of rural development projects should be undertaken by Directors of Provincial Offices and Governors of Cantons.
- The information on the actual village conditions that Directors of Provincial Offices have grasped is very limited. The system in which agents make tours to villages in order to grasp the actual village conditions and make regular reports is indispensable for rural development.
- The contact points between residents and agents/administrative agencies in the present extension system are limited to the necessary minimum activities such as extermination of diseases and insect pests, vaccination and illegal tree-cutting regulations. For providing support to residents, it is essential to provide the opportunities for the administration side to have regular hearings of the opinions of residents.
- The Provincial Technical Conference (CCTP) has been established in the Provincial level as a system to promote mutual tie-ups among related administrative agencies and the Governor of each Canton has the responsibility for coordination and supervision of other administrative agencies (such as ZAT, ZATE and SDECV leaders in the agricultural, stock-raising and sylvicultural sector) in the Canton level. However, these systems are not fully functioning.
- The agents for agriculture, stock raising and sylviculture are able to give technical and administrative advice on the matters under their responsibility (such as, for example, extermination of diseases and insect pests for agricultural agents and illegal tree-cutting regulations for forest agents). However, they have poor consciousness of making joint works beyond their own technical ability or fields in order to implement any comprehensive rural development across agricultural, stock-raising and sylvicultural fields.
- It is often difficult for agents and administrative officials to directly support residents in the Sahel Region because of difference of mother languages. Thus, it is indispensable for them to depend on the cooperation of NGOs that are making the activities rooted in local areas and good at local languages.
- It is difficult to expect so soon that agents and administrative officials will be familiar with the Participatory Rural Appraisal (PRA) method to become the implementers of rural development projects, but it is necessary to furnish them with the training for the PRA method continuously in order to deepen their understanding of the significance of the residents' participation in rural development on their initiative.

【Considerations for M/P Recommendation】

In Burkina Faso, the programs related to rural development including promotion of the decentralization and establishment of CVGT by PNGT are being implemented. However, some programs involve a discrepancy between the system and practice aspects and some are still in flux and reflux. Therefore, the following 4 points will be considered in recommending the M/P:

- The contents of the M/P to be recommended should be considered to keep the integrity with

the existing frameworks under any policies and secure the sustainability. In addition, it is conditioned that any activity recommended in the M/P should be shifted to one of the activities under the administrative frameworks if the alternative to it is available on the administration side when the administrative frameworks are complete.

- The organization recommended in the M/P is intended to provide the residents that take the program to alleviate land degradation upon themselves with efficient support through the mutually cooperative relationship among the smallest administrative units in the agricultural, stock-raising and sylvicultural fields and through the cooperation with NGOs.
- The M/P recommends the program to support the move of reorganizing the extension programs promoted by the Government of Burkina Faso including decrease of agents and charged extension of agricultural, stock-raising and sylvicultural techniques under the structural coordination program as well as the release of the extension projects to the private sector.
- In Burkina Faso, 1,500 CVGTs have been established as of the end of 2002. Some of these CVGTs have not kept a given level, in terms of functionality, independent development and organizational appropriateness in representing the public opinions, depending upon their individual backgrounds of establishment and the support received in their establishment. However, the existing CVGTs will be positively used and positioned as the pivots of rural development in the recommended M/P in taking the existing programs by the Government of Burkina Faso into consideration.

【Contents of M/P】

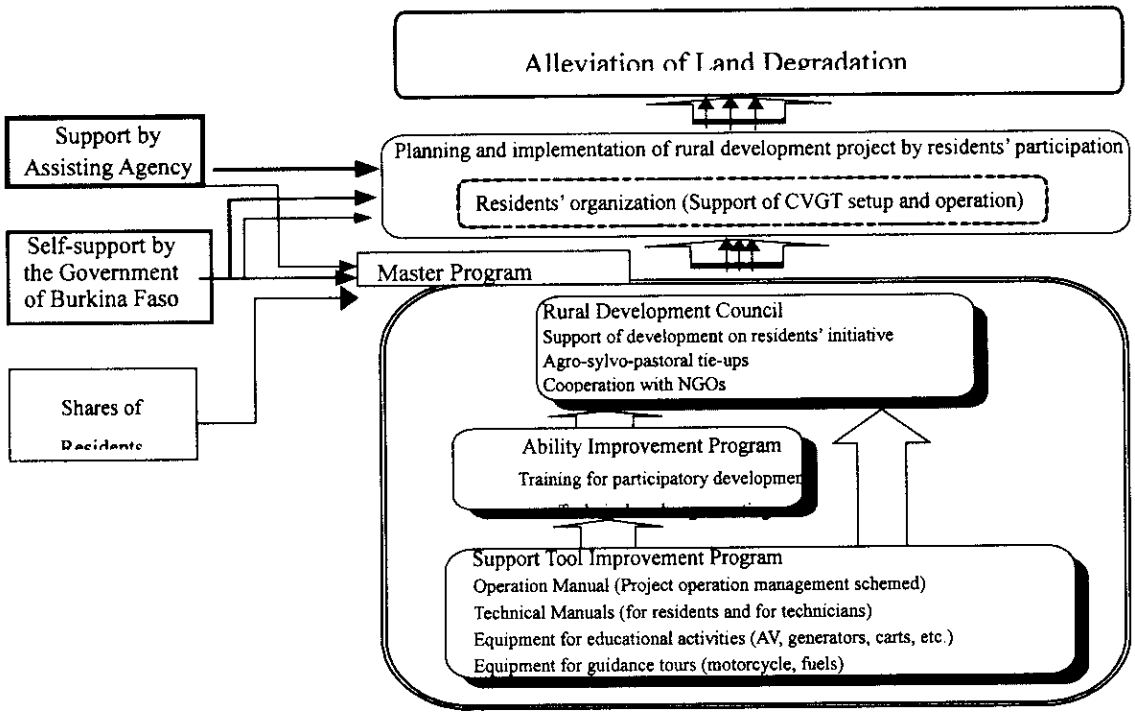
In the M/P, the following three items are recommended:

① Improvement of the residents support system through establishment of Rural Development Council

② Improvement of agents' ability of supporting residents through the ability improvement program

③ Reinforced and more efficient activities for supporting residents through the support tool improvement program

The flow of the process from the Verification Study through the M/P to alleviation of land degradation is summarized in Figure listed below.



【Setup of Rural Development Council】

Setup of Rural Development Council

1. Purpose

The Ministry of Agriculture, Hydraulics and Halieutic Resources will set up the Rural Development Council as the access contact for residents support in promotion of agricultural development, stock-raising development and appropriate management of natural resources such as forests with the cooperation of Ministry of Animal Resources and Ministry of Environment and Living Environment and in the tie-ups with NGOs and using the national budgets and the support of assisting organiztions, in order to contribute to alleviation of land degradation through the sustainable rural development.

2. Basic Policies

① To promote the residents' willingness to development and, therefor, to use the existing residents' organizations such as CVGT and support the setup of CVGT as needed.

② To use agents and forest agents as the access contacts between residents and the administration.

③ To complement the incomplete functions of the smallest administrative units in using NGOs for each individual project for rural development.

3. Functions

The function of the Council is to support the rural development projects including agricultural and stock-raising development and resource management to contribute to the program to alleviate land degradation on residents' initiative.

4. Organizational Structure
   ① Director of Provincial Agriculture, Hydraulics and Halieutic Resources Office (hereinafter Provisional Agriculture Office Director), and technical staff
   ② Agricultural agents (ZAT-leaders and UAT-leaders)
   ③ CVGT representatives
   ④ Stock-raising agents (ZATE-leaders) and forest agents (SDECV chiefs)
   ⑤ NGOs in charge of project implementation
   ⑥ Chief of Rural Society Extension and Guidance Section, Regional Department (SAC/MR Chief)

5. Organizational Character
   ① Positioned as a smallest administrative unit for the support of the rural development projects to be implemented for the program to alleviate land degradation.
   ② Functions as a model to improve the smallest administrative units and to reorganize municipalities under the Government of Burkina Faso. The Rural Development Council will transfer its functions to the administrative system and resolved, if its functions are replaceable by the improved administrative unit.
   ③ The know-how accumulated for the residents support through the activities of the Rural Development Council is deemed to be improved human resources of the members and used within each administrative system.

6. Implementing System
   ① The Rural Development Council will be operated by the Director of Provincial Agriculture Office in close relationship with the Regional Agriculture, Hydraulics and Halieutic Resources Department.
   ② The Director of Provincial Agriculture Office will make positive use of technical staff of the Office and furnish them with On the Job Training in operating the Rural Development Council.
   ③ Rural development projects will be implemented on the initiative of residents.
   ④ The residents support necessary to implement such projects will be provided by NGOs.
   ⑤ Agricultural agents will provide NGOs and residents with administrative guidance and technical support necessary to implement projects.
   ⑥ If the tie-ups with other fields such as stock-raising industry and forest resource management are required, the cooperation of stock-raising agents with forest agents are called for.
   ⑦ The Director of Provincial Agriculture Office will make reports on the program to alleviate land degradation implemented using the Rural Development Council to Provincial Technical Conference (CCTP) and other related agencies, and make requests especially for the cooperation of stock-raising and forest agents to the Director of Provincial Animal Resources Office and the Director of Provincial Environment and Living Environment Office.
   ⑧ Agricultural agents will have regular meetings with the governors of Cantons to report the activities of Rural Development Council, and make requests for the cooperation of stock-raising and forest agents through the governors of Cantons.

7. Activity Items
   ① Support for CVGT setup in the villages in the Study Area
   ② Support for CVGT operation
   ③ Support for implementation of rural development projects
   ④ Monitoring and assessment of rural development projects

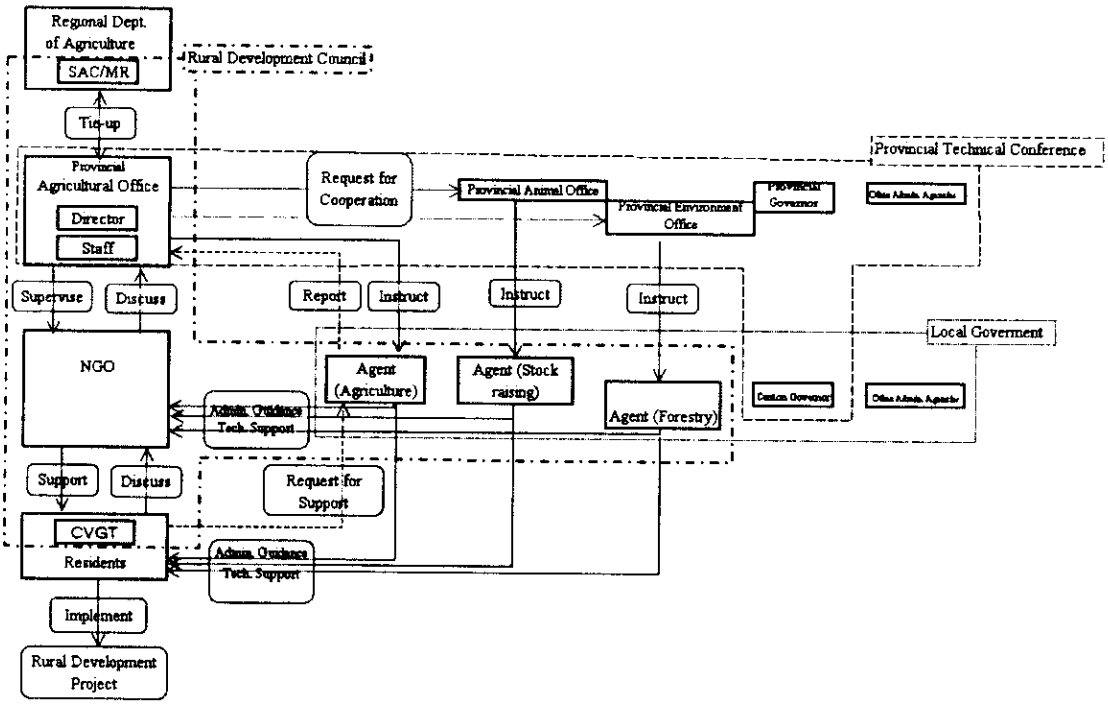
8. Required Period for Establishment of Support System

The period required from the setup of the Rural Development Council in a Canton through the conductance of independent activities until its establishment as the access contact for residents support is estimated to be 4 years and the period for the villages in which the Rural Development Council has already been set up is estimated to be 3 years.

The process of establishing CVGT is roughly estimated to take one year.

The period of implementing a rural development project is one to two years and the period of monitoring and assessment is one to two years.

The conceptual diagram of the system to operate the Rural Development Council is shown in the Figure listed



【Ability Improvement Program】

Ability Improvement Program

1. Purpose

To improve the participation-type development ability of agents as the access contacts to connect between residents and the administration and the rural development support organizations such as NGOs, and to improve technical ability of agents as technical supporters to residents.

2. Target Agents

Agricultural, stock-raising and sylvicultural agents (ZAT-, ZATE-, SDECV- and UAT-leaders)

3. Items of the Program

(1) Training for participation-type development scheme

① Familiarization in lectures with the theory and practice of the participation-type development scheme (including considerations for gender)

② On-the-Job Training through village status surveys using the participation-type development scheme

③ Training of facilitator candidates for the participation-type development scheme through the mock training in which trainees serve as lecturers.

④ Assistance in the extension of the participation-type development scheme that the trained facilitator candidates provide

(2) Technical exchange meetings with INERA and other institutes

①	Introduction of techniques to alleviate land degradation:	Agriculture
②	- ditto -	Stock raising
③	- ditto -	Sylviculture
④	- ditto -	Soil conservation

⑤ Outline introduction of advanced experiments and researches

⑥ Opinions of agents on future trend of experiments and researches to meet the needs of residents

4. Methodology of the Program

(1) Training for participation-type development scheme

① Regional Agriculture, Hydraulics and Halieutic Resources Department will employ a consultant familiarized with the participation-type development scheme to provide the training.

② The training courses as listed in 3. (1) ①~④ will be provided in a series of activity once a year.

③ Training will be provided one year and 2 years after establishment of the Rural Development Council.

④ The period of training will be about 7 day

(2) Technical exchange meetings with INERA and other institutes

① Regional Agriculture, Hydraulics and Halieutic Resources Department will enter into a contract with an INERA branch center to hold the meeting.

② The meeting will be held on the program as 3. (2) ①-⑤ for a one-day schedule once in a year.

③ The meeting will be held one to 3 years after establishment of the Rural Development Council.

【Support Tool Improvement Program】

Support Tool Improvement Program

1. Purpose

This program is intended to complement the functions of the Rural Development Council and the ability improvement program as recommended in the M/P for demonstration of higher effects and to provide equipment and materials necessary for the Council to efficiently make the residents support activities.

2. Items of the Program

(1) Preparation and distribution of operation manuals

The matters to be considered for enforcement of the M/P will be wrapped up as an operation manual based on the knowledge acquired through the process of formulating the M/P. This operation manual will be distributed the concerned with the Rural Development Council.

(2) Preparation and distribution of technical materials

The technical materials for agents' guidance and for technical extension to residents will be prepared and distributed to the concerned with the Rural Development Council as the supplemental materials for efficient extension of techniques to residents.

(3) Installation of equipment for educational activities

As the use of audio-video equipment is effective for educational extension to residents, one complete set of equipment for educational activities consisting of a video deck, a TV set, a generator, a transport vehicle and cheap lodging facility will be deployed in each Province.

(4) Securing of equipment for guidance tours

To make guidance tours to residents with mobility and efficiency, 3 motorbikes will be deployed in each Canton and the fuels for them will also be secured in order to provide administrative guidance and technical support to the residents in UAT(ZAT), ZATE, SEDCV and NGOs.

【Milestones of the M/P】

As a result, the period required for implementation of the M/P will be 31 years until 2037 in the Middle-North Region and 28 years until 2034 in the Sahel Region.

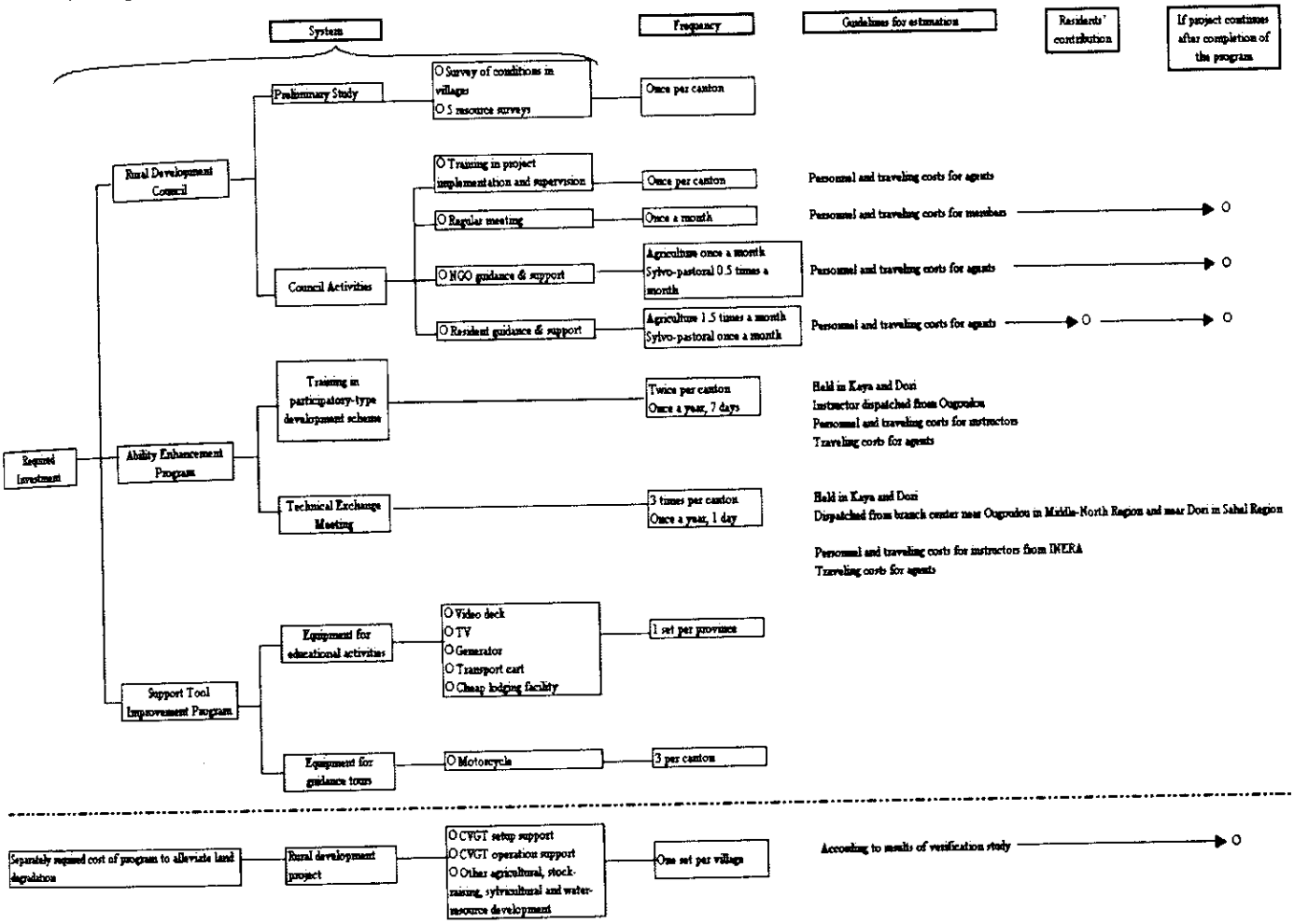
【Number of Villages Subject to the Implementation of the Program to Alleviate Land Degradation 】

At present, each Provincial Agriculture, Hydraulics and Halieutic Resources Office has 3 to 5 technical staff members. In operation of the Rural Development Council, one staff member per Canton assists the Director of the Provincial Office to improve the staff's ability of formulating project plans and supervising the project implementation.

If the required budget is secured after the development project is completed in the target villages in a certain Canton, it will be anticipated that the rural development project to serve the alleviation of land degradation will subsequently be implemented using the Rural Development Council that has been set up. In this case, the program to alleviate land degradation will be implemented in 351 villages by the Rural Development Council that will be improved through the course of implementation of the M/P.

【Required Investment in M/P Implementation】

The investment required for implementation of the M/P has been estimated in accordance with the basic guideline shown in the Figure listed below.



The results of estimation are indicated in the Table listed below, in which the estimated residents' share and the project cost are divided into two categories: the case of establishing the system in all the Cantons in the Study Area and the case of implementing the program to alleviate land degradation in parallel in the Cantons where the system has been established. As a result, the number of villages in which the program to alleviate land degradation will be implemented is also indicated. The residents' share in the required investment and the rural development project cost including the costs of CVGT setup and operation support are also indicated for reference.

(Unit : 1,000Fcfa, village)

	Total		Middle-North Region		Sahel Region	
	Cost	Villages	Cost	Villages	Cost	Villages
System establishment	3,714,537	54	1,914,342	28	1,800,195	26
Residents' share	96,000		49,920		46,080	
Project cost	2,895,000		1,505,400		1,389,600	
Program against land degradation	22,485,880	351	11,621,680	180	10,864,200	171
Residents' share	666,240		343,680		322,560	
Project cost	20,091,300		10,364,100		9,727,200	

IX. Summary of Problems and Proposals

【Problems to be Solved in Phase II】

Following 5 points are remaining problems after the completion of Phase I study.

① Examination of Consistency with Framework of Policies of Burkina Faso Government Relating to M/P
continue to be the issues to be examined in Phase II.
② Enhancement of Activities of Rural Development Activity Coordination Unit
③ Enhancement of Capabilities of Agents
④ Enhancement of Capabilities of CVGTs and Residents
⑤ Necessity of further definition for the criteria and requirements of such Selection of Appropriate NGOs

【Proposals】

We propose these 8 items to the Government of Burkina Faso.

① Cooperation between Related Ministries for Alleviation of Land Degradation
② Reconsideration of Extension System and Improvement of Quality of Administrative Officials
③ Method of Planning and Implementing Projects
④ Decentralization and Securement of Funds
⑤ Settlement Promotion for Alleviation of Land Degradation
⑥ Implementation of Projects through Cooperation with Local Organizations, NGOs, etc.
⑦ Encouragement of Production of Agricultural Products for Export
⑧ Promotion of Literacy Education and Familiarity with Weights, Measures and Area

Chapter 1

Chapter 1 Introduction

1.1 Background of the Study

With drought as the impetus, international measures to alleviate land degradation in the Sahel countries have been implemented mainly by United Nations organizations, but adequate results have not yet been achieved. The importance of voluntary participation by residents in the measures was confirmed in previous cases. On the other hand, however, the Sahel countries have no system of local administrative organs that provide support for residents from a technical and organizational standpoint, and this has inhibited the promotion of measures for alleviation of land degradation.

Burkina Faso, one of the Sahel countries, has suffered severe damage from land degradation due to variable rainfall, population growth, soil erosion and soil degradation. In addition, as there is no system of local administrative organs, measures to alleviate land degradation through the support of residents have not been implemented adequately. In order to improve the above-mentioned situation, the government of Burkina Faso requested Japan to carry out a study to examine a system to promote measures for alleviating land degradation.

1.1.1 Measures for the alleviation of land degradation in the Sahel region of Africa

In addition to natural factors such as drought caused by the reduction in rainfall, land degradation is the phenomenon in which the soil deteriorates due to exploitative production activities that exceed the regenerating ability of local resources, such as exploitative agricultural methods, excessive grazing of livestock and excessive tree cutting in the forests to meet the growth in population. Land degradation affects 25% of the entire land on the earth (3.6 billion ha) and approximately one sixth (1/6) of the entire population of the world. Especially in Africa where the advance of land degradation threatens the very foundations of residents' survival, measures for the alleviation of land degradation constitute an important issue.

International efforts to alleviate land degradation have been conducted mainly under the United Nations Environmental Program (UNEP) under the impetus of the drought in the Sahel region of Africa from 1968 to 1973, but adequate results were not achieved. In order to remedy this situation, in 1992 the United Nations Convention to Combat Desertification (UNCED) passed a resolution to request the General Assembly of the United Nations to adopt an agreement on measures for the alleviation of land degradation. As a result, the Convention on the Combat for Desertification (CCD) was adopted in June 1994 and it was agreed that activities would be conducted with international cooperation.

While international interest in the alleviation of land degradation is growing, some changes have been seen as a result of reflection on previous measures. These include: ① activation of measures with resident participation, ② recognition of the necessity to cooperate with NGOs, and ③ development of mutual coordination on projects through the National Activity Project on the Combat for Desertification (PANLCD: Program Nationale de lutte contre la Desertification). However, the system necessary for accomplishing PANLCD is still inadequate.

1.1.2 Problems in previous efforts

In order to alleviate land degradation, it is necessary to: ① convert agriculture and stock raising, which are the main occupations in the target regions, from exploitative to sustainable agriculture and stock raising, ② maintain and restore the productivity of land where the soil has already deteriorated or is deteriorating, and ③ at the same time, use forest resources and water resources in a sustainable manner. These measures can be said to be one solution to land degradation through the eradication of poverty.

In order for these activities to be implemented continuously and lead to alleviation of land degradation, residents who use the land every day must be duly aware of the soil degradation, its causes and the problems generated by soil degradation, and independently implement the measures.

For this reason, this Study uses the Terroir Management Method based on support for the independent efforts of residents, and tries to alleviate land degradation through the implementation of agriculture, stock raising and rural development projects.

Through the various measures previously conducted by aid organizations, it was confirmed that: ① the independent efforts of residents are indispensable for the alleviation of land degradation, and ② the introduction of the Terroir Management Method[1] is effective for this reason.

On the other hand, the following points came to light when introducing the Terroir Management Method.

- The local administrative organs of the recipient country do not have a system of human and technical support to provide guidance on development at village level.
- In order to compensate for this weakness, NGOs are used in some cases. However, as no methodology which could be used as a guideline for selecting NGOs has been established, at present the NGOs are selected through trial and error for each project.
- A system to coordinate the aid organizations, the government of the recipient country and the NGOs, as well as a monitoring system to manage the progress of projects are still in a state of trial and error.
- Furthermore, in many cases the implementation system of the recipient country at central government level is controlled by different organizations for agricultural, stock raising and sylvicultural activities and for rural development, and there is insufficient cooperation between the organizations.

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[1] Terroir means "a spacious area of farmland or grassland owned and/or used by a certain group, the range of ownership and right of use by that group of which is recognized by other neighboring groups". Terroir does not necessarily coincide with administrative divisions such as villages or hamlets, or with topographical divisions. The Terroir Management Method places the entire responsibility for management of the land resources used by the group with the said group through a series of processes to foster an awareness of autonomy by the Terroir members, improves the natural resources and living environment in the Terroir from a long-term viewpoint, and promotes the drive for regional development.

1.1.3 Request from the Government of Burkina Faso

(1) Background of the request

Burkina Faso is one of the Sahel countries that have suffered from drought and land degradation since about thirty years ago. Farmers and stock raisers constitute the majority of the population of Burkina Faso (approximately 80% of the working population were employed in primary industry in 1991) and agricultural and stock raising production is in an unstable condition for the following reasons.

As the farmers and stock raisers use the land exploitatively through excessive land development and tree felling and excessive cultivation and grazing, the fertility of farmland, pastures and forests deteriorates and the soil becomes degraded. As a result, land becomes prone to damage by wind erosion and water erosion, and it becomes dry and bare causing a reduction in vegetation. When the balance between the production activities of residents and the self-recovery ability of the environment is lost as described above, regional resources such as farmland, forests and ground water decrease and the productivity of the soil drops. (Refer to Figure 1.1.1.) As a result, the living environment of the residents becomes increasingly unstable and the acquisition of sufficient food becomes difficult. Therefore, the residents become poorer and the number of residents working away from home increases.

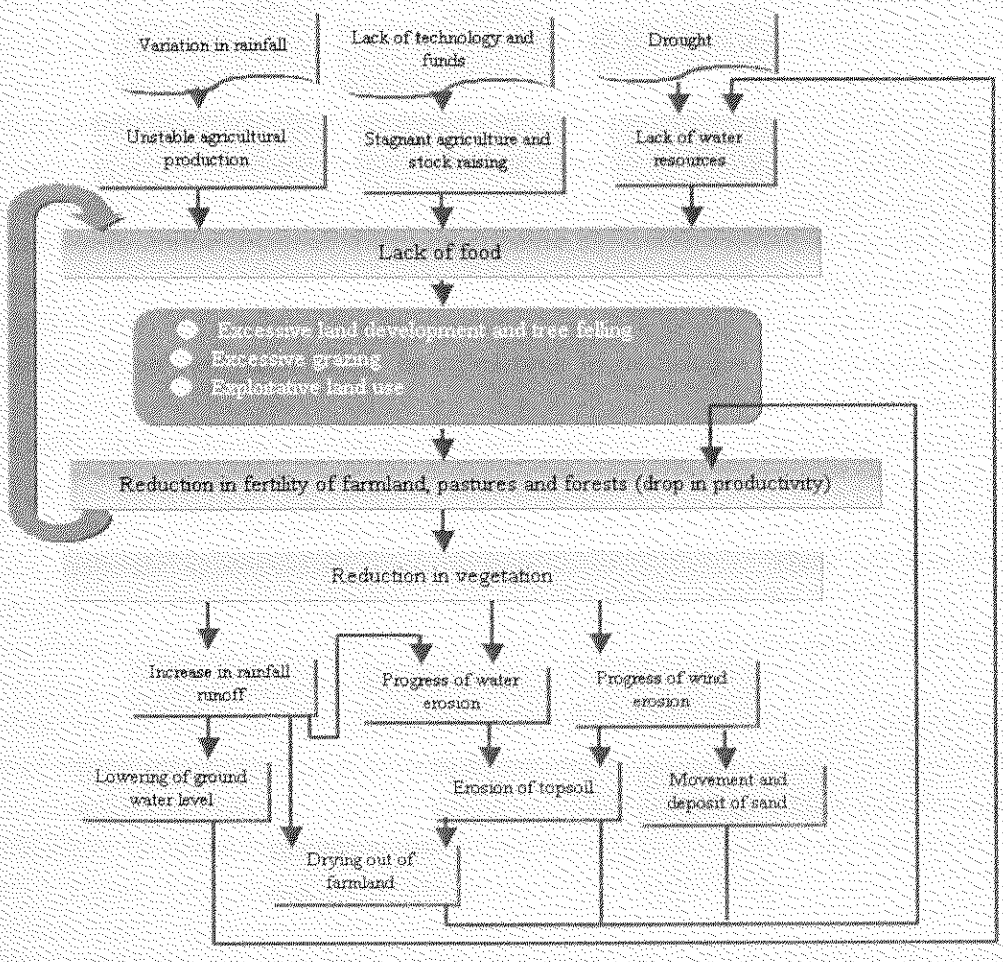


Figure 1.1.1 Mechanism of land degradation

2) Population growth

The population growth rate in the Sahel region is 2.82% a year, which is higher than the national average (estimated at 2.7% in 1997). Seno province in particular shows a population growth rate of 3.04%. In order to secure food to feed the growing population, in recent years pastures and forests have been developed and farmland is being continuously expanded. If this continues, the development of farmland can be expected to reach its limit in the near future. After that, exploitative farming will proceed and the productivity of the land will drop. As a result, there will be shortages of food, firewood and fodder for livestock.

3) Soil erosion

With regard to soil erosion, relatively large gullies were confirmed at 27 locations in Yakouta village near Dori city in the results of the field study conducted in 1998. More than half of these have been diagnosed as requiring prompt measures. Some of the gullies are 6 meters wide and 3 meters deep, erosion extends to part of the residential district, or roads are severed and villages are cut off during the flood season because of them.

(2) Content of the request

Against the aforementioned background, the government of Burkina Faso requested the cooperation of Japan on a study with the following contents, based on various techniques and program formulation methods related to the alleviation of land degradation, which Japan has accumulated through various studies in the past.

- Creation of an efficient method of promoting a comprehensive rural development project that will contribute to the alleviation of land degradation in Burkina Faso.
- The above-mentioned development project shall be supported and implemented by the administration, private sector and aid organizations with the participation of residents, who are the main implementers of the activities.
- Continuous study and analysis of the state of land degradation through activities to alleviate land degradation, and acquisition of knowledge on the structure and management of the implementation system
- Creation of practical teaching materials that farmers can use directly while implementing pilot activities.

1.2 Objectives of the Study

The Study has the following objectives:

① To examine a system required to implement effectively the measures for alleviating land degradation in Burkina Faso and organize and propose it as the Program for the System to Alleviate the Land Degradation (M/P),

② To implement the human resource development and technology transfer by establishing the M/P.

The object of the Master Plan (M/P) is to improve the administrative organs, establish an extension system and strengthen the functions. It also endeavors to improve the support system for residents

directly affected by land degradation through the improvement of administrative organs and establishment of an extension system

1.3 Methods of the Study

The Study was carried out as follows:

- Analyzing the present status of promotion system and social and natural conditions and checking the impeding factors
- Establishing the M/P (draft)
- Carrying out the verification study required to check the effectiveness of the M/P
- Implementing the M/P based on the result and evaluation of the verification study

1.4 Nature, society and the economy

Burkina Faso became independent on August 5, 1960. It has a national land area of 274.2000 km^2 and a population of 10.31 million (1996 census). Located in the center of West Africa, it is a landlocked country surrounded by six countries.

1.4.1 Natural environment

(1) Weather and vegetation

In Burkina Faso, Harmattan blows from the Sahara Desert in the north from January to February and monsoons arrive from the Gulf of Guinea in the south from June to August. The southern part of the country belongs to the Sudan climatic zone where the average rainfall is 900 mm to 1300 mm a year and the rainy reason lasts for six months. The central region belongs to the Sudan-Sahel climatic zone and accounts for half of the entire national land area. The average precipitation in this zone is 600 mm to 900 mm a year and the rainy season lasts for approximately four to five months. The northern part belongs to the Sahel climatic zone which accounts for 25% of the country and the average rainfall is 150 mm to 600 mm a year. According to meteorological data, the annual rainfall is decreasing throughout the country. Accordingly, the Sahel climatic zone is moving south. Figure 1.4.1 shows the shifts in the isohyetal line. Compared with the period before 1970, tbere has been a drop of approximately 100 mm in the last thirty years.

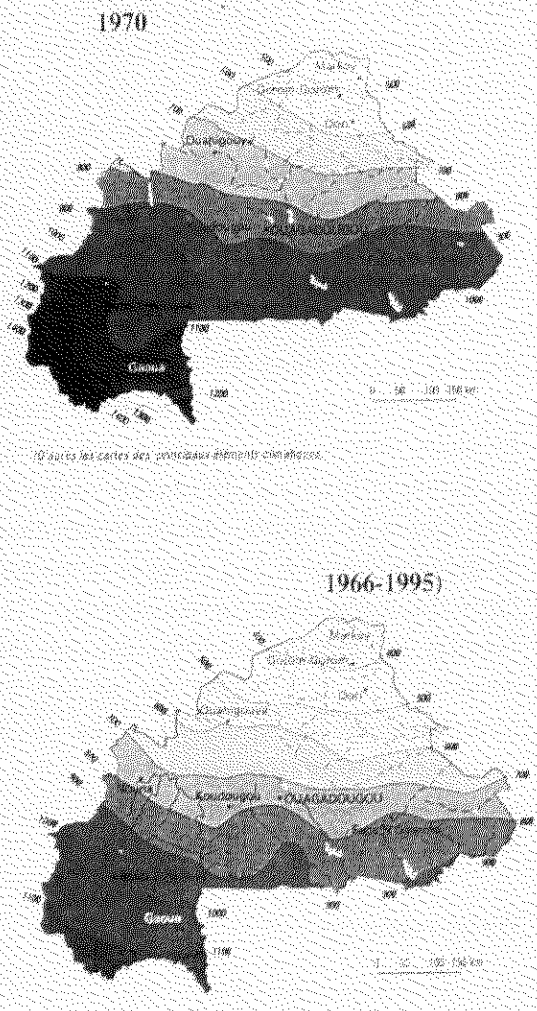


Figure 1.4.1 Shifts in the isohyetal line

The vegetation can be broadly classified into three zones from the south: the Sudan-Guinea zone, the Sudan zone and the Sahel zone.

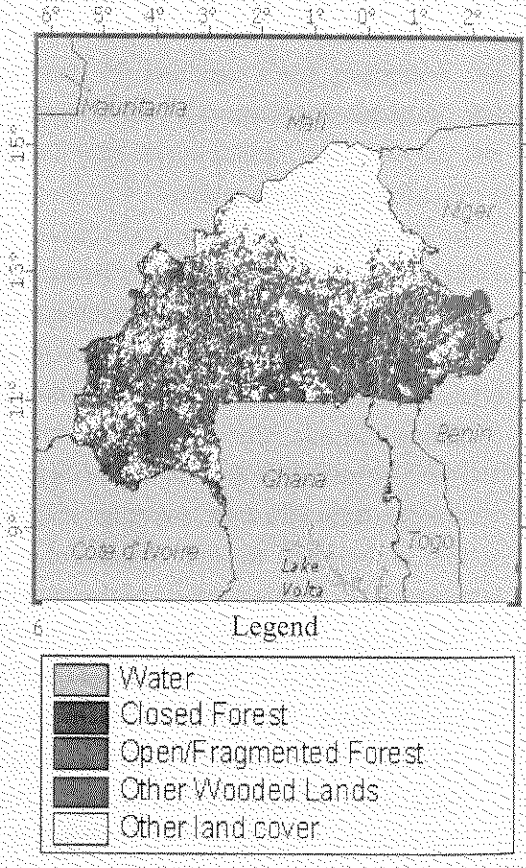
The Sudan-Guinea zone features an average annual precipitation of more than 1,000 mm and high wood density. The forests consist of Burkea africana, Isobelinia doke and Detarium microcarpum.

The Sudan zone accounts for most of the country of Burkina Faso. The average precipitation in this zone is 600 mm to 1,000 mm a year. The woods consist of Butyrospermum parrkii (karite), Khaya senegalensis (african mahogany), and Parkia biglobosa (nere). Grasses consist of Andoropogon gayanus (andropogon) which belongs to the rice family, and Cymbopogon ssp.

The Sahel zone is located north of latitude 14 degrees north where the average precipitation is less than 600 mm a year and the dry season lasts for eight to ten months. The vegetation is characterized by steppes scattered with thorny bushes and shrubs like the spots of a tiger. Typical trees are Acacia Senegal, Acacia raddiana, Balanites aegyptiaca and Bauhinia rufescens.

(2) Sylvicultural resources

Sylvicultural resources, one of the natural resources, are widely used by local residents as fuel, food, seasoning and traditional medicines and are one of the important resources that support the lives of local residents. However, the area of natural forest in Burkina Faso, a key supply source, shrank by more than 100,000 ha a year, from 15.42 million ha in 1980 to 14.16 million ha in 1992, mainly as a result of tree felling for development arising from population growth. Forest resources are deteriorating qualitatively as well as quantitatively due to excessive grazing, unregulated branch cutting by stock raisers, fire, excessive tree felling for the collection of firewood, destruction of low-resistance tree species by climate change, destruction of trees by grazing livestock, and changes in the grasses that form the lower layer of the forests. The World Forestry White Paper of 2001 indicates that forests cover an area of 7,089,000 ha, of which artificial forests account for 67,000 ha. The percentage of natural forests in the country is 25.9%. Forest accumulation[2] is estimated to be 10 m^3/ha and wood biomass[3] 16 t/ha.



(Source: FAO FRA2000)

Figure 1.4.2 Distribution of forests in Burkina Faso

(3) Water resources

[2] Total area of upright trees with bark and a diameter of more than 10 cm at chest height

[3] Biomass indicates the amount of live trees or woody sections of withered trees above the ground (trunk, bark, branches, twigs), and shrubs.

The average flow of surface water is estimated at 8 billion m^3/year in 1991 and the total reservoir area is 100,000 ha. The main catchment basins and wet zones are the Comoe River (catchment area of 18,000 km^2), Volta River (120,000 km^2) and Niger River (72,000 km^2). A study conducted in 1993 shows that there are 2,100 reservoirs, of which 380 are used throughout the year. The statistics for 1992 show that 380 million m^3 of water was supplied, of which 233 million m^3 was supplied by irrigation to an area of 24,330 ha.

On the other hand, the total amount of ground water replaced each year by penetration is estimated at approximately 9.5 billion m^3.

(4) Soil resources

Soil resources can be classified into eight types by geographic and morphologic characteristics as shown in Figure 1.4.3.

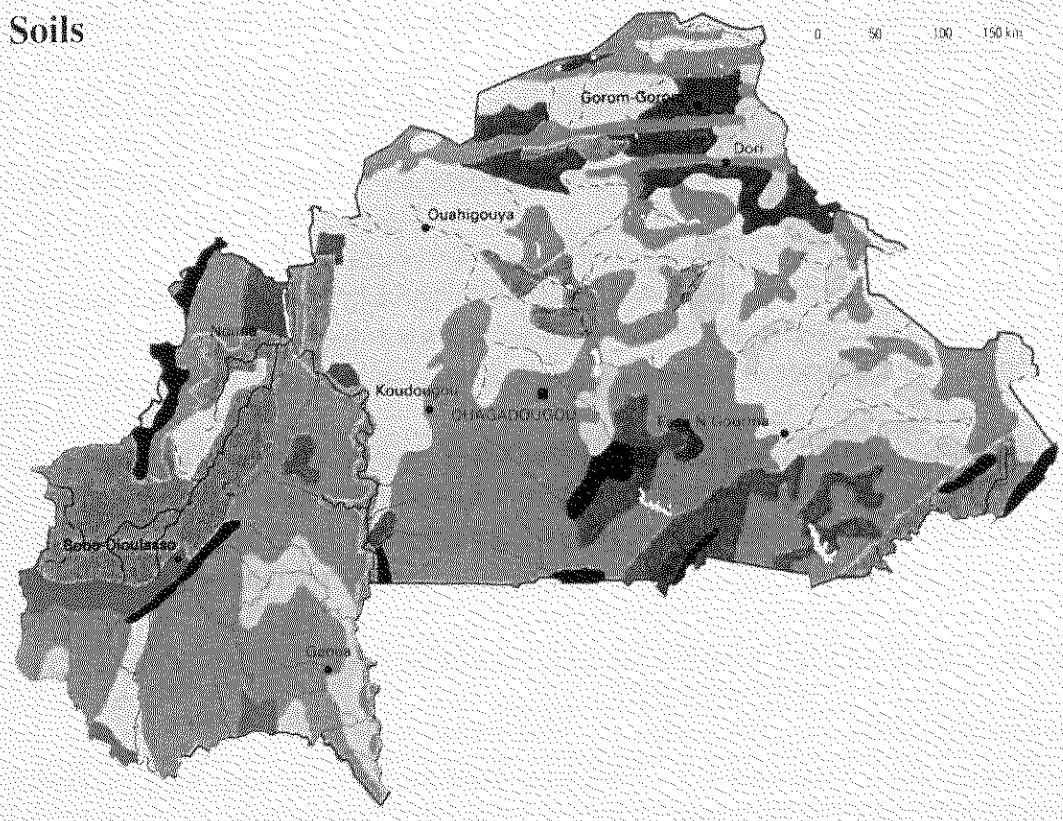


Figure 1.4.3 Soil distribution in Burkina Faso

Legend and main characteristics of the soil map

- (3% of the country): Lithosols located over various rocks and surface crust
Has no value as farmland because it is difficult for roots to penetrate and has poor chemical properties.

- (26% of the country): Underdeveloped soil located on gravel base
Soil is not deep enough and does not contain enough water to be suitable for cultivation.

- (6% of the country): Vertisol soil located on alluvial or gravel base
Contains a lot of clay and inorganic matter. High yields can be obtained by appropriate cultivation methods.

- (6% of the country): Tropical brown soil with abundant nutrients located on clay base
Best low density, porous soil in the country.

- (38% of the country): Tropical iron-containing and tropical iron-free leached soil located on sand, sandy clay or clayey sand base
Does not contain much calcium or potassium, but has good or quite good water retention ability.

- (2% of the country): Lateritic soil with slight base-desaturation located on sandy clay base
Exists only around Bobo-Dioulasso. Acidic and permeable with low chemical potential.

- (13% of the country): Pseudo-gley inorganic hydromorphic soil located on base with various properties
Temporarily excessive water. Traditionally used for cultivation of sorghum. Has medium chemical potential. Poor soil packing.

- (5% of the country): Low even-structured halomorphic soil. Solonetz soil located on clayey sand base
Mixed with brown and ferreous soil in the north and with Vertisol in the south. Development is limited by chemical and physical characteristics.

Source: Afrique Atlas and Rapport sur l'etat de l'environnement au Burkina Faso 2002/3 SP/CONAGESE

(5) Animal resources

Thirty-five species of large mammals exist in Burkina Faso. The small animals eaten by these large mammals have great potential, of which water birds account for the majority. Most are migratory birds and number in the hundreds of thousands.

There are approximately 120 species, 57 genuses and 24 families of fish. The main fish that are of economic use are Tilapia, Heterotis, Clarias and Mormyrus. According to one study, the average annual yield of fish from lakes and mares is estimated to be 60 to 12 kg/ha, and 50 to 100 kg/ha from rivers.

1.4.2 Society

(1) Population

According to the census taken in 1996, the population of Burkina Faso is 10,312,609. Compared with the 1976 census population of 5,639,203, the population almost doubled in 21 years with an average annual increase rate of 2.7%. The birth rate in Burkina Faso is 4.7% and the mortality rate is 1.7%. Infant mortality in particular stands at 9.7%. Ninety percent of the working population is engaged in agriculture.

(2) Race and language

Approximately 50% of the nation belongs to the Mossi tribe, followed by the Peul (approximately 8%), Gourmantche, Bobo and Gurunsi tribes. There are more than thirty tribes in Burkina Faso. The Mossi tribe, which is the largest tribe in the country, moved into Burkina Faso from the south in the latter half of the fifteenth century and established a Mossi kingdom.

Table 1.4.1 Component ratio of the main tribes

Tribe	Population ratio (%)	Main location
Mossy	48.6	Central area
Peul	7.8	Northern area
Gourmantche	7.0	Eastern area
Bobo	6.8	Western area
Gurunsi	6.0	Southern area
Bissa	4.4	Central southern area
Others	19.4	

Source: Afrique Atlas and materials from Laval University in Canada

About sixty languages are said to be spoken in the country, and this presents a major obstacle not only to the spread of elementary education in French, which is the official language, but to ordinary communication among residents.

(3) Education

1) Education system

In 1991, the Burkina Faso Basic Education Policy was formulated by the Research and Planning Department of the Ministry of Basic Education and Public Literacy (Ministere de l'Enseignement de Base et de l'Alphabetisation, currently MEBA), and the Basic Education Law came into force in 1996.

Under the Basic Education Law compulsory education is from age 6 to age 12, and basic education is stipulated as preschool education for children aged 3 to 6 and elementary education for children aged at least 6 and over (of 6 years' duration).

The ratio of children attending school barely reached 10% in 1970. However, it rose to 29% in 1990 and today exceeds 40%. The ratio of children attending school is steadily improving. However, it is very hard to advance to the next grade and many children are kept down because they failed the examination.

Table 1.4.2 Recent trends in the ratio of children attending school

Index	Educational year		
	1999/2000	2000/2001	2001/2002
Total school entry rate	36.8%	36.8%	40.3%
Total school attendance rate	41.3%	42.7%	43.4%
Population of children aged 6 to 12	2,061,542	2,110,395	2,160,410
No. of children attending school	852,160	901,291	938,238
No. of regular elementary schools (public and private)	4,860	5,131	5,389

Source: MEBA

In 1997, the year after the Basic Education Law came into effect, a strategy was drawn up in the education sector. A Ten Year Plan for the Development of Basic Education (PDDEB),

which is a sector plan in the basic education sector, was drafted in 1999 and officially started in September 2002. The objectives of the PDDEB are: ① to achieve a school attendance rate of 70%, ② to achieve a literacy rate among adults of 40%, ③ to build 20,130 classrooms, ④ to establish 4,000 permanent literacy and vocational training centers (CPAF: Centre permanent d'Alphabetisation Formation), ⑤ to establish 3,000 non-formal basic education centers (CEBNF: Center de l'Enseignement de Base et non formule), and ⑥ to train 20,671 new teachers.

2) Literacy education

Literacy education is managed by the MEBA. The activities are supported by donor organizations and private donations. The programs are contained in manuals. The correct literacy rate is difficult to ascertain even from official statistics and is said to be approximately 20% in the entire country.

Adult literacy education provided by the MEBA from 1990 to 2000 mainly consisted of activities at semi-private sector literacy centers (CA) supported by Swiss and UNICEF funds. At present, 3,761 adults are registered at these centers, but support from Switzerland has ceased and operation of the centers is becoming increasingly difficult. Centers with no outside support from NGOs have in fact stopped operating. For this reason, recruitment and training of literacy instructors, which until 2000 were carried out every year by the Provincial Office for Basic Education (DPEBA: Direction Provincial de l'Ensiegnement de Base et de l'Alphabetisation), have ceased.

At present, the MEBA is converting to Permanent Literacy and Vocational Training Centers (CPAF: Centre Permanent d'Alphabetisation Formation). Furthermore, 4,000 CPAF centers [4]will be established under the Ten Year Plan for the Development of Basic Education (PDDEB). The CPAFs face various problems related to funds, such as the construction of permanent facilities and personnel expenses for permanent staff. However, as of August 2003, the shift to CPAF has become MEBA policy. There is a strong possibility that the literacy education provided by the MEBA will be reviewed in the future, such as using elementary school buildings, and there is a lot of interest in the literacy school project for evening classes. The CPAF assumes that students will be 15 years old or over and its main purpose is to improve the literacy rate of women in the rural villages. However, future education measures in Burkina Faso will be directed towards the promotion of education by expanding elementary and middle school education rather than putting effort into literacy education.

3) Educational issues

As issues on education, the following can be listed.

① The system of advancing to the next grade in compulsory education is strict and many students are kept down even if they are keen to learn. As a result, the average quality of the nation cannot be improved.

② Literacy education requires an enormous amount of funds, for example, for providing

[4] In 2002, such centers had been established at 607 locations.

classrooms, training teachers, paying meal costs to motivate residents and paying the salaries of the teachers.

③ Acquisition of literacy is helpful for: a) getting loans from the credit union, b) making advantageous business deals, and c) operation and management of micro credit. On the other hand, however, even after taking literacy education classes and mastering the local language, residents do not continue their education if it does not lead to individual profit.

④ Farmers are too busy to attend classes during the day. Women in particular have difficulty attending classes due to excessive labor.

(4) Religion

As for religion in Burkina Faso, followers of Aminism exceeded 60% in 1960 immediately after the country declared independence. Today, however, the number of Muslims and Christians is increasing and adherents of Aminism have fallen to 26%. As of 1991, more than 60% of the nation is Muslim, and especially in Oudalan and Soum Seno provinces in the Sahel region, Muslims account for more than 90%. The ratio of Christians has increased from approximately 4% in 1960 to approximately 20%. There is little religious conflict. The people of Burkina Faso are tolerant of other religions, and the believers of different religions cerebrate religious holidays together while funerals transcend religious boundaries.

(5) Rural society

Rural society in Burkina Faso displays the strong influence of the customs of the Mossi tribe which accounts for about 50% of the population. The traditional village chief system for controlling village residents and the "master of the land" system for granting and managing usufructuary rights relating to land are implemented in the majority of villages. These systems were rejected by the revolutionary regime of 1984 to 1987, but many of the villages have reverted to their pre-revolutionary state. (Details are described in Chapter 4.)

The political system is strongly affected by the Mossi tribe, but economic activities are strongly influenced by the Dyula tribe. The Dyula tribe is widely distributed in West Africa. Dyula means "traveling merchants engaged in long-distance trading" in the Mandingo language. In Bobo-Dioulasso, the second largest city in Burkina Faso meaning the "house of Bobo and Dyula", there are many overseas trading companies and companies engaged in the processing of agricultural products, making Bobo-Dioulasso the center of economic activities.

1.4.3 Economy

(1) General economic situation

In 2002, cotton, the top export item of Burkina Faso, was hit by the decline in the export price because of recession in the Asian countries which are its main customers. Although the volume of exports increased, the total export value dropped slightly. However, the gross domestic product (GDP) increased to 2,028,964.2 million Fcfa and the actual growth rate was 11.6%. Per capita GDP was extremely low at around 202,896 Fcfa (about ¥41,900).

Table 1.4.3 Shifts in GDP

Unit: Million Fcfa

Year	1998	1999	2000	2001	2002
GDP	1,497,569.6	1,572,125.3	1,638,460.1	1,817,479.0	2,028,964.2
Compared with previous year	+8.4%	+5.0%	+4.2%	+10.9%	+11.6%

Source: INSD

(2) National finance

As for public finance management in Burkina Faso, there continues to be a large revenue deficit year after year despite the efforts of the government. The revenue deficit stands at around 20% of expenditure although it varies year by year. The need to secure revenue has resulted in a constant external debt.

Table 1.4.4 National finance

Unit: 10 million Fcfa

Item	2000	2001	2002
Revenue	36,306	31,323	34,649
Expenditure	42,430	38,056	44,963
Balance	-6,124(14%)	-6,73(18%)	-10,314(23%)

Source: INSD

(3) Industrial structure

The industrial structure according to the rate of added value is shown below. The industrial structure of 2002 shows that primary industry accounts for 34.9%, secondary industry 21.7% and tertiary industry 43.4%.

Table 1.4.5 Industrial structure

Unit: 10 million Fcfa

Item	2000	2001	2002
Added value	1,148,041	1,210,036	1,273,707
Primary industry	35.2%	36.2%	34.9%
Secondary industry	21.9%	21.2%	21.7%
Tertiary industry	42.9%	42.6%	43.4%

Source: IAP/Juin 2003. The added values are converted to current values in 1985.

(4) Trade trends

Trade in Burkina Faso continues to be stagnant. Exports in 2002 amounted to 118,032 million Fcfa (approximately 25,247 million yen). Cotton accounted for 61% of this at 72,191 million Fcfa (approximately 15,442 million yen). When cottonseed oil is included, cotton exports account for 63% (73,918 million Fcfa.).

Table 1.4.6 Trends in the trade balance

Unit: Million Fcfa

Imports and exports	1999	2000	2001	2002
Exports	132,188	116,568	126,327	118,032
Cotton	92,237	74,323	75,186	72,191
Sesame	3,105	2,267	4,503	4,562
Live cows	5,654	4,359	5,660	2,859
Live sheep	1,459	1,567	2,279	2,316
Cottonseed oil	0	1,973	3,387	1,727
Sheepskins	1,797	2,527	3,105	1,551
Gold	3,160	2,485	954	832
Imports	358,766	352,598	404,385	402,156
Chemical fertilizer	11,558	8,218	11,042	18,696
Diesel oil	8,919	18,740	21,875	17,561
Medicines etc.	11,820	14,808	12,973	16,382
Gasoline	10,778	19,889	20,569	15,909
Cement	1,300	2,061	6,983	13,303
Kerosene	6,121	13,820	15,069	13,282
Rice	12,116	6,891	11,931	12,503
Trade balance	-226,578	-236,030	-278,058	-284,124

(5) Tax system

The government of Burkina Faso is moving towards decentralization. However, tax reforms to secure the tax sources to support this system are still being developed.

The present tax system is divided into national tax and local tax as shown in Table 1.4.7.

To outline shifts in the system, the poll tax dating from the colonial age was abolished during the period of the revolutionary regime, and introduction of a livestock tax caused residents to leave the country so it was abolished.

Today farmers do not pay tax by cereal production. Although various taxes are imposed on stock raising at the distribution stage, no tax is directly imposed on farmers. Farmers, therefore, are not in a position to press the government for budget allocations.

The following two items can be mentioned as economic issues.

① The weakened national economy is caused by a lack of foreign currency for purchasing imported consumer goods. Therefore, export goods (agricultural products for export) urgently need to be found to obtain foreign currency.

② There is a tax system of sorts. However, partly because of lack of staff, taxes are not collected. The tax collection system must be improved.

Table 1.4.7 Present state of tax system

National tax	Distribution of tax revenue
(1)Commercial and industrial income tax (2)Value-added tax (3) Drink tax (4) Tobacco tax (5) Insurance tax (6) Procedural tax on various procedures (7) Livestock export tax [5]	100% to the central government budget

Local tax	Distribution of tax revenue
(1)License tax (on scale of commercial activity)	100% to Commune
(2)Residence tax (on houses)	100% to Commune
(3)Infrastructure tax on roads etc. (on infrastructure and repairs)	100% to Commune
(4)Real estate use tax (on scale of commercial activity)	Distributed among government, provinces and Communes
(5)Livestock movement tax [6]	Distributed among Communes
(6)Market use tax	100% to Commune

[5] Export tax is imposed when livestock is exported. Although this is a national tax, it is a special-purpose tax which is set aside as a "livestock development fund" and used for promotion of the livestock industry. The livestock development fund is used for building fodder storage sheds for the dry season and digging wells for livestock.

[6] The livestock movement tax is imposed when livestock is moved for selling purposes. It is imposed by the first province to which the livestock is moved. Subsequent provinces can be passed through by showing the tax certificate issued by the first province. This tax is 300 Fcfa for a cow and 75 Fcfa for a sheep.

Chapter 2

Chapter 2 Related National Programs

Land degradation is advancing in Burkina Faso because of the numerous droughts over the past thirty years and the resulting soil degradation. This has also caused poverty, and the government of Burkina Faso has formulated a strategy to handle poverty. In this strategy, the government has declared the need for food security and environmental conservation as important issues. The government has formulated several national programs as guidelines for handling this kind of situation, such as the National Action Program to Alleviate Land Degradation[1] (PANLCD: Programme d'Action Nationale de Lutte Contre Desertification) in 1999, the National Action Program for the Environment[2] (PANE: Programme d'Action National de l'Environnement) in 1999, the Strategic Program for the Study of Agriculture (PSRA), National Measures for the Agricultural and Stock Raising Industry, National Measures for Forests (PFN) in 1998, and so on.

2.1 National Action Program to Alleviate Land Degradation (PANLCD)

In 1999, the National Action Program to Alleviate Land Degradation (PANLCD) was formulated as the basic policy to counter desertification. (Refer to Appendix 2.1). PANLCD consists of: ① natural, social and statistical outlines, ② natural resources and land degradation, ③ summary and analysis of measures for land degradation, ④ agreement on measures to alleviate land degradation and the formulation process of PANLCD, and ⑤ objectives and guiding principles of PANLCD.

The item especially related to this Study is: ⑤ objectives and guiding principles of PANLCD, and the following points should be noted.

1) Transfer of responsibilities and power of decision relating to the management of natural resources through the promotion of a decentralization policy
2) Strengthening of cooperation among government, NGOs and aid organizations
3) Reflection of the opinions of local residents in the measures
4) Utilization of the participatory method in formulating programs

PANLCD revised and/or formulated laws related to the alleviation of land degradation including: ① Law concerning the Reorganization of Land and Agricultural Land (RAF: La Loi Portant Reorganisation Agraire et Fonciere), ② Environmental Law, ③ Forest Law, ④ Mine Law, ⑤ Basic Law concerning Water Management, and ⑥ Basic Law concerning Stock Raising to ensure safer access of producers to natural resources. An outline of these laws is given below.

(1) Law concerning the Reorganization of Land and Agricultural Land (RAF),

This law was revised in 1995 with the aim of formulating and promoting land regulations adapted to the local society and economy.

(2) Environmental Law

This law was adopted in January 1997. It defines measures to alleviate land degradation as the

[1] The first National Action Program to Alleviate Land Degradation was adopted in 1986.
[2] PANE was formulated taking into consideration the social and economic aspects of environmental issues as well as the various objectives of PANLCD. PANE was designed to integrate all the activities, measures and implementation organizations of PANLCD.

primary basic principle.

(3) Forest Law

This law was adopted in January 1997. It stipulates recommendations for joint possession and management of forest resources and natural conservation areas through appropriate forest restrictions on the societies and economies of rural areas.

(4) Mine Law

This law was adopted in October 1997. It stipulates the need for compatibility between mine development and environmental conservation.

(5) Basic Law concerning Water Management

This law establishing the basic guidelines for water resource measures was formulated in April 2001. In the main, it provides for coordination in areas where use of water is competitive, such as urban areas and their suburbs.

(6) Basic Law concerning Stock Raising

This law was promulgated in November 2002. It stipulates the principles and methods for sustainable, peaceful and integrated development of stock raising, agriculture and sylviculture.

2.2 National Action Program for the Environment (PANE)

PANE was formulated in 1991 to integrate the activities, measures and implementation organizations of all the strategic programs provided for in PANLCD. In this sense, this program should be the standard framework for activities related to improvement of the environment and living environment. The program lays down a comprehensive framework for environmental policy. PANE includes five programs: ① Terroir management, ② improvement of the living environment, ③ management of national property, ④ development of environmental qualifications, and ⑤ management of environmental information.

In order to achieve PANE, it is necessary to formulate and implement programs related to the alleviation of land degradation. At the rural development level, an Adjustment Program for the Agricultural Sector (PASA: Programme d'Ajustement Sectoriel Agricole) is planned and at the natural resources management level, a National Program for Terroir Management (PNGT: Programme National de Gestion des Terroirs). In addition, a Forest Management Program and Water Use Program are also planned.

2.3 Strategic Program for the Study of Agriculture (PSRA)

PSRA was adopted in October 1995 with the aim of supporting the achievement of social and economic development goals to solve environmental problems. Its policy includes adequate recognition of the regional restrictions and potential of agriculture, the securing of food security and the alleviation of land degradation and poverty, taking into consideration better knowledge of the environment and appropriate methods for the sustainable management of resources (soil, water, plants and animals). It aims at relieving the effects of drought on agriculture and vegetation and ensuring the conservation and recovery of the soil.

2.4 National Measures on Agriculture and Stock Raising

2.4.1 Adjustment Program for the Agricultural Sector (PASA)

PASA is an economic reform program started in 1992 as a related program of the aforementioned PANE with the support of the World Bank (IBRD: International Bank for Reconstruction and Development). PASA was formulated for the main purpose of: ① modernizing and diversifying production, ② developing food security, and ③ improving the management of natural resources.

The main achievements of PASA at the first stage are: ① liberalization of markets and prices, ② improvement in the cotton and sugar production sectors, and ③ reorganization of agricultural services directly affecting stock raising.

In order to promote the objectives of PASA, a Notice on Agricultural Development Measures (LPDA: Lettre de Politique de Development Agricole) was issued in the same year, in which the following five strategies were determined.

① Concentration of production and improvement of the management of natural resources
② Liberalization of markets and prices
③ Reconstruction of the systematic framework
  i) Redefinition of the role of the government, especially withdrawal of the government from roles that can be substituted by the private sector
  ii) Specification of operators in the financial sector in rural villages
  iii) Strengthening of the role of producer groups
④ More effective utilization of public funds
⑤ Strengthening of policies and strategies relating to food security at national level

At present, a Strategic Guideline Document (DOS: Document d'Orientations Strategiques) has been established as the concrete objective of agricultural development for the promotion of PASA until 2010, and various activity programs based on the guidelines are mentioned in the Strategic Action Plan (PSO: Plan Strategique Operational).

2.4.2 Strategic Guideline Document (DOS)

Formulated in 1998, the overall objective of DOS is to "continuously ensure agricultural production suited to the demands of residents while maintaining or improving their lives and the state of the environment". It lists the following concrete goals.

① To contribute to raising the annual income of agricultural workers and stock raisers by at least 3% per person
② To increase agricultural and stock raising production by an annual rate of 5% to 10% in the next ten years
③ To create a situation in which current meat consumption (9.3 kg/person) can be doubled to achieve an adequate balanced food supply to the nation (intake of 2,500 kcal a day per person)
④ To improve the value of agricultural and livestock products through modern, small-scale

processing, preservation and coordination industries

⑤ To improve the level of private investment in the production and diversification of agricultural and livestock products

⑥ To develop industries related to livestock raising (milk, meat, leather) and vegetables

⑦ To promote the specialization of private sector actors in the fields of supply, commerce, processing and finance

From these objectives, it can be seen that DOS is aimed at increasing agricultural production, activating the local market economy and promoting independent private activities.

2.4.3 Strategic Action Plan (PSO)

Drawn up in 1999, PSO establishes five priority programs and six individual plans with the aim of increasing the yield of cereals, niebe, root tubers, cotton, fruit, vegetables and oil producing plants[3]. DOS lists fertilization of the soil, nutrition and food security, modernization of agriculture, support for producers and producers' organizations, and systematic support as priority programs.

The rural development strategy in the target area of this Study involves improving productivity by supporting stock raising and food security. For this purpose, it must contribute to solving the problem of poverty in rural villages through recovery of the fertility of the soil by utilization of organic matter and conservation of water and earth as well as through measures for food security and diversification of cash income.

2.4.4 Action Plan and Investment Program for the Stock-Raising Sector (PAPISE: Plan d'Actions et Programme d'Invetissement du Secteur de l'Elevage)

As measures for the stock-raising sector, the Ministry of Animal Resources approved a basic action plan in November 1997 consisting of the action plans shown in Table 2.4.1.

[3] Peanuts, karite, sesame

Table 2.4.1 Basic action plan for the stock-raising sector

Item	Action plan
Activities related to stock raising	Improvement of indigenous cows and other livestock by selection, artificial insemination and transplantation of fertilized eggs
Environmental activities	①Feeding and watering: To boost the use of fodder in appropriate locations (conservation of natural grass by mowing at proper time, use of silage), utilize multi-purpose crops that can be used as food and fodder, cultivate fodder cereals and improve water supply facilities
	②Division of stock-raising area: To divide the stock-raising area into three zones. To make the Sahel region into a breeding zone, the central plateau region into a fattening zone, and the western and southern regions into a cultivation zone for fodder crops and an intensive stock-raising area
	③Livestock hygiene: To create an epidemiological map for the establishment of an early warning system, reinforce prevention of pleuropneumonia, promote the active participation of the private sector, improve vaccination techniques, reinforce the quarantine line at the border, establish epidemiological monitoring and uninfected zones, and establish regional laboratories in Dedougou and Dori
Improvement of pasture and securing of land	①To put signs along grazing routes and improve the water supply through on-going projects
	②To allocate pastures and improve the laws related to the designation of regions, formulate a Grassland Law, set up a legal organization for seasonal transhumance, and formulate a design standard for the improvement of pasture zones
Finance and artificial resources	①Finance: Amount of stock-raising finance for purchasing livestock, amount of credit for investment in stock raising-related facilities (500 billion Fcfa), production activities and distribution to consumers
	② Artificial resources: Education of technical management staff and producers, and educational support for associations and women
	③Support for industry: To construct factories to manufacture meat and dairy products, construct a dairy processing factory capable of processing 30,000 to 50,000 L/day in Bobo-Dioulasso city, and produce cheese, which will lead to an increase in women's income

Based on the above-mentioned action plan, the Action Plan and Investment Program for the Stock-Raising Sector of Burkina Faso (PAPISE) was formulated in October 2000.

2.5 National Forestry Measures

The Government of Burkina Faso has drawn up various national forestry plans to improve sylvicultural resources which are in a critical state. Recent plans have shifted towards resident-initiated plans that promote the participation of local residents from the planning stage, and continuously entrust responsibility for management of sylvicultural resources to local residents.

Furthermore, it is necessary not only to conserve the part of nature called sylvicultural resources, but also to implement measures that take into consideration all natural resources. As programs related to the management of natural resources, the Terroir Management and Water Use Programs have been improved focusing on sylvicultural management.

The National Program of Terroir Management (PNGT: Program National de Gestion des Terroirs) adopted in 1986 is one of the programs related to Terroir management and is considered to be the mainstay of sustainable development in rural villages that does not only apply to the sylvicultural sector. The objectives of this program are shown below.

① To give a sense of responsibility to rural communities regarding their own future
② To contribute to the establishment of typical village organizations that are recognized,

accepted and considered the only partner by actors outside the Terroir

③ To create an inter-Terroir organization[4] to handle and coordinate the various activities outside the Terroir

The Water Use Program is a national measure for the use of water adopted in 1992 and consists of programs related to village water use, use of water for stock raising and agriculture, and management and conservation of water resources.

The National Village Forestry Program (PNFV: Programme National de Foresterir Villageoise), National Forest Management Program (PNAF: Programme National d'Amenagement des Forets), and Forest Energy Program[5] have been formulated as sylvicultural management programs. In addition, the National Five-year Reforestation Program (1998-2003) and Greenbelt Concept have been formulated as policy guidelines. These programs are positioned as national measures in which conservation and recovery of sylvicultural resources are given priority. (Refer to Table 2.5.1.)

Table 2.5.1 Outline of Recently Formulated National Forestry Programs

Name	Year formulated	Purpose
National Village Forestry Program (PNFV)	1991	- Contribution to Terroir management and organization of residents - Training of local residents, and sufficiency of sylvicultural products for the needs of local residents through reforestation - Extension of proper techniques for water and soil conservation and agro-forestry techniques - Conservation of natural resources by local residents - Improvement of the income of local residents
National Forest Management Program (PNAF)	1996	- Utilization of sylvicultural resources through rational development - Recovery of deteriorated sylvicultural resources - Protection of the diversity of the ecosystem - Securing of employment and income in local regions - Establishment of forest zones under the control of the local government
National Five-Year Reforestation Plan (PNR)	1998	- Establishment of cooperation with grass-roots organizations - Increase in sylvicultural and agricultural production using techniques suited to the local socio-economy and ecosystem - Protection of the diversity of the ecosystem - Strengthening of the ability to cooperate with various organizations

2.6 Decentralization

With the support of the IMF and IBRD, the Government of Burkina Faso started a structural adjustment program in March 1991. The main purpose of this program is to correct the imbalance between national finances and the trade balance and to strengthen the private sector. The item related to this Study is the promotion of decentralization.

[4] Organization established with the aim of coordinating the collaborative actions of multiple Terroirs.

[5] This program is positioned between two programs and is implemented at present as part of the review by the World Bank of the measures of the traditional energy sector (RPTES).

Promotion of decentralization has the following merits: ① a closer relationship between the providers and the beneficiaries of administrative services, ② simplification and speeding up of administrative affairs and procedures, ③ provision of administrative services suited to local characteristics, ④ improvement of accountability by building a close relationship with the beneficiaries, and ⑤ improvement of local organizations.

However, in order to achieve these merits, it is necessary to enhance the coordinating and supervisory functions of each sector. This Study is closely related to the decentralization policy promoted by the Government of Burkina Faso.

2.6.1 Promotion of decentralization

In Burkina Faso, a decentralization committee directly governed by the prime minister has been organized to promote decentralization with the support of the EU, Germany, and Holland.

A law related to the organization of a national land administration was formulated in 1998 and revised in July 2001 and in August 2003. (Refer to Attachment 2.2)

2.6.2 Transition to local government and transfer of authority

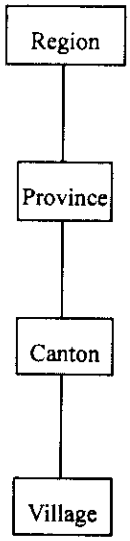
At present, 47 cities which held commune assembly elections in September 2000 (of which 45 are city communes and 2 are special city communes) have been recognized as local governments. (Refer to Attachment 2.2 and Figure 2.6.1.)

The "regions" will become local governments by 2008. As for the "provinces", "cantons", and "villages", only administrative boundaries will be established. Districts other than city communes and special city communes will become "rural communes". The rural communes, which will focus on the canton capitals, will become local governments through assembly elections by 2007.

Transfer of authority will be conducted as follows.

① Eleven powers relating to land, the environment, natural resources management, economic development plans, etc. in the said regions will be transferred from the local organizations of the related Ministries to the local governments.
② As for the educational, cultural, and health and hygiene sectors, staff will be transferred from the central government to the local governments along with the transfer of power.
③ With regard to other sectors, staff will not be moved when power is transferred, but central government staff will be dispatched to local governments to provide guidance.
④ The staff of three Ministries, the Ministry of Agriculture, Water Use and Fishery Resources, the Ministry of Animal Resources and the Ministry of Environment and Living Environment will not change their status as central government staff. However, when local governments such as rural communes are established and start functioning one after another in future, they will be required to implement measures according to the intentions of the said local governments.

<Administrative Districts >



<Local governments>

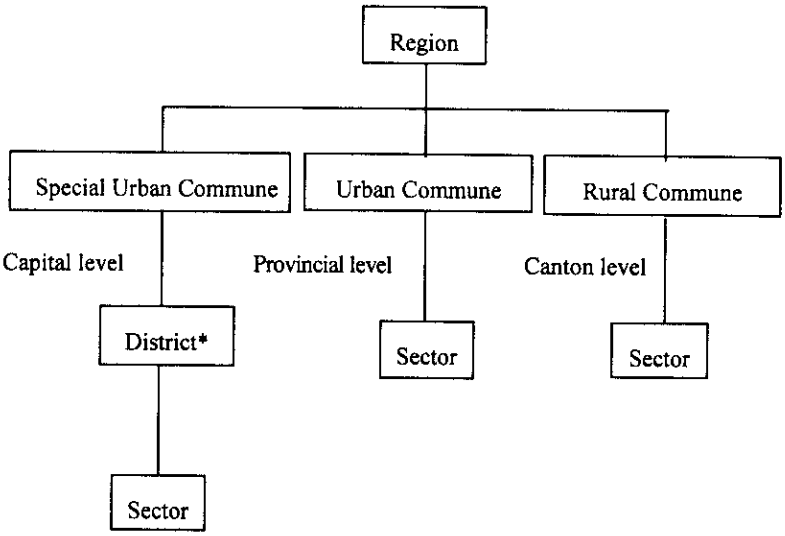


Figure 2.6.1 Organization of the Administrative Districts

Note 1: This figure was drawn up in December 2003 according to the content of the second revision of the law (approved by the Diet in August 2003 and under examination by the Constitution Bureau in December 2003).

Note 2: There are 13 regions and they function as administrative districts and local governments. There are 45 provinces, 350 cantons and approximately 8,000 villages, all of which function only as administrative districts. Communes function as local governments and districts marked with an asterisk (*) have the status of legal entities and are financially independent.

2.7 Summary of issues

National programs relating to the alleviation of land degradation can be summarized as follows.

① Although various measures and plans have been formulated, they have no financial support and lack staff. Therefore, they lack effectiveness.

② This is the transitional period to decentralization. Training of staff who will be responsible for local administration after decentralization is inadequate. Steps must be taken in this area, including improvement of the system.

Chapter 3

Chapter 3 Status of Administrative System

3.1 Administrative Organization

The major administrative agencies of Burkina Faso that are involved in activities at village level related to the program to alleviate land degradation include the Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), the Ministry of Animal Resources (MRA), the Ministry of Environment and Living Environment (MECV) and the Ministry of Economic Development (MED). Of these Ministries, the three Ministries related to agriculture, stock raising and sylviculture were reorganized in 2002. The organizational changes are shown in Fig. 3.1.1.

Agents belonging to the Ministries are sometimes recruited as counterparts for projects undertaken by international organizations or the activities of NGOs, but in most cases they work individually within each Ministry and few projects are implemented with cooperation between Ministries.

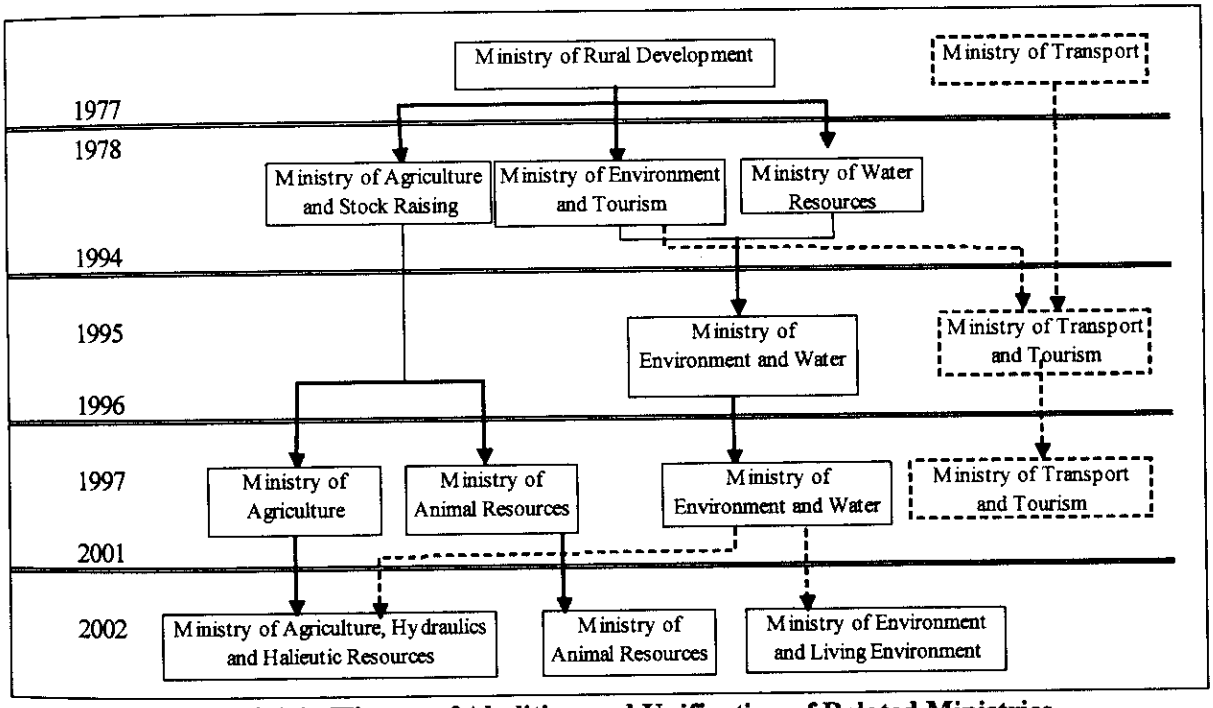


Figure 3.1.1 History of Abolition and Unification of Related Ministries

3.1.1 Status of Related Ministries

(1) Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH)

In the organizational reform of the administration implemented in 2002, the department in charge of water resources development (former General Department of Water Use) and the department in charge of the marine products industry (former Fisheries Department) that belonged to the former Ministry of Environment and Water were integrated into the former Ministry of Agriculture which was reorganized as the Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH). As a result, this Ministry consists of 6 technical general departments (to which regional departments belong) and 5 secretariat departments. (See Appendix 3.1.)

The Research and Planning Department (DEP), which is the counterpart agency in this Study, is

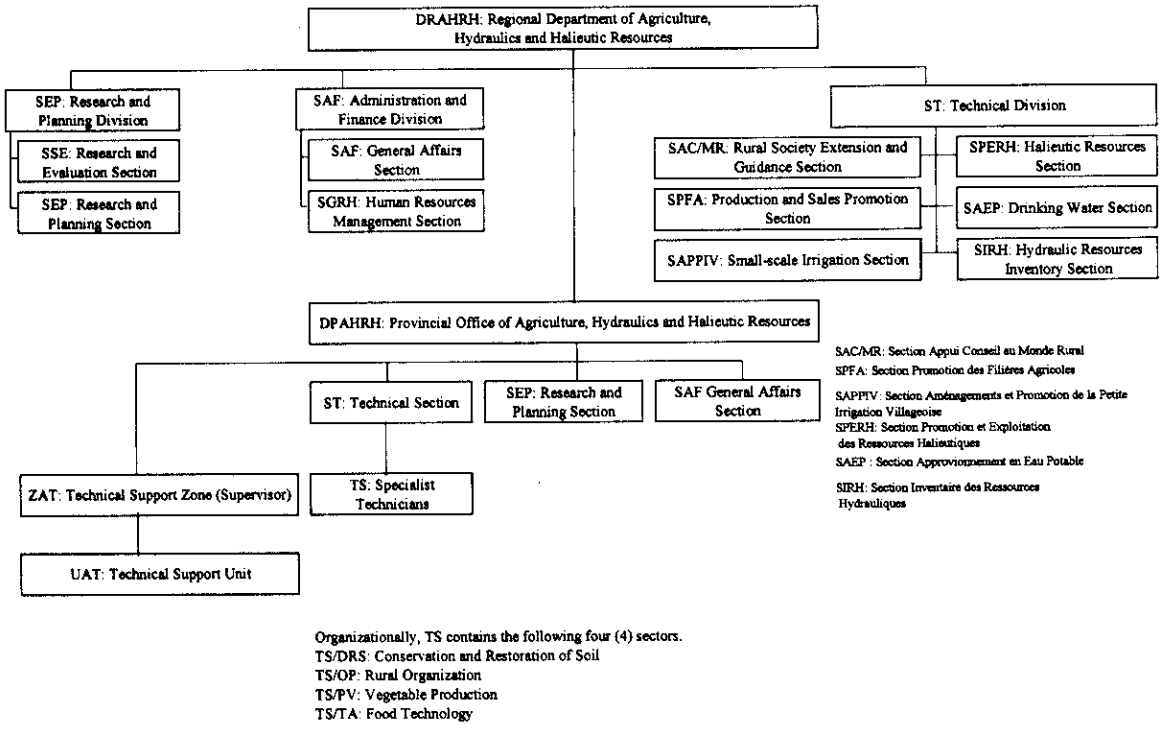
responsible for the planning, supervision and assessment of projects. On the other hand, the Department of Extension, Research and Development which belongs to the General Department of Vegetation Production is responsible for support of residents in the promotion of agricultural technology directly linked to the program to alleviate land degradation.

As the implementing agencies of the National Program in the agricultural sector, Regional Departments of Agriculture, Hydraulics and Halieutic Resources have been set up in the 13 regions into which the country has been divided and Provincial Offices of Agriculture, Hydraulics and Halieutic Resources have been set up in 45 provinces.

Three departments have been set up in the Regional Departments and they in turn have been engaged in organizational development since the organizational reform in 2002. In fact, however, there are some offices that have no actual officials and do not function in accordance with the organizational regulations. This tendency is more obvious in the Provincial Offices.

The organization of the Regional Departments and Provincial Offices is as shown in Fig. 3.1.2.

Figure 3.1.2 Regional Organization Chart of Agriculture, Hydraulics and Halieutic Resources



Organizationally, TS contains the following four (4) sectors.
TS/DRS: Conservation and Restoration of Soil
TS/OP: Rural Organization
TS/PV: Vegetable Production
TS/TA: Food Technology

(2) Ministry of Animal Resources (MRA)

The Ministry of Animal Resources (MRA) was not affected by the ministerial reorganization in 2002, but it was subjected to the central organizational reform in 2003. (Refer to Appendix 3.2.)

The Ministry of Animal Resources was set up by separating the stock-raising sector from the Ministry of Agriculture and Stock Raising in 1997, and it is still weak in terms of human resources and facilities. For example, the Ministry consisted of 7 departments in 2001, but its full staff numbered only 21. In the Middle-North Region, its office was moved to a different location from that of the Regional Department under the former Ministry of Agriculture, but in the Sahel Region, its office is still located in the Regional Department under the former Ministry of Agriculture. Therefore, the extension system described later does not always function adequately due to the lack of actual staff deployment, and its activities are limited by manpower.

(3) Ministry of Environment and Living Environment (MECV)

This Ministry consists of 4 General Departments, 4 Departments in charge of personnel, research and planning, etc., and 2 independent administrative corporations including the National Forest Seeds Center. (Refer to Appendix 3.3.)

In this Ministry, the forestry sector is controlled by the General Department of Water and Forests (DGEF) and activities in rural areas are dealt with directly by the Department of Rural Forestry (DFR). In the regions, Regional Departments of Environment and Living Environment (DRECV) are responsible for promoting national policies.

The Permanent Secretariat of the National Council for Environmental Management (SP/CONAGESE) was established[1] in the Ministry of Environment and Water as an agency to discuss environmental considerations in the social, economic and cultural development processes with the primary aim of formulating PANLCD.

After the formulation of PANLCD, however, there arose difficulties in securing the experts required to deal with issues over a wide range and there was criticism of the centralized coordination by the Ministry of Environment and Water of the regional development in which several Ministries are involved. At present, CONAGESE has been reorganized as the National Committee for Environment and Sustainable Development (CONEDD) and is only responsible for coordination among General Departments under the Ministry of Environment and Living Environment.

1) Rural Forestry Department (DFR)

The role of the Rural Forestry Department (DFR) is to promote reforestation techniques and conduct surveys of resources at the central level under the General Department of Forestry. The newly organized DFR consists of 4 bureaus: Planning and Statistics (SPS, monitoring and assessment), Forest Technology Promotion (SVTF), Natural Resource Recovery and Protection (SRPRN, related to reforestation) and Alternative Fuels/Non-wood Forest Products Promotion (P-EA/PFNL). At present, 4 to 5 projects are being planned and implemented. SPS is in charge of coordinating and following up the projects and programs

[1] As specified by the Environmental Law enacted in 1997.

within DFR, and SVTF is responsible for the spread and enhancement of abilities in promoting rural forestry activities.

2) **Regional Department of Environment and Living Environment (DRECV)**

The role of the Regional Department of Environment and Living Environment is to enforce regional policies in the environmental and forestry sectors in cooperation with the National General Department. DRECV has control of regional departments and provincial offices. The regional departments differ slightly by region, but basically they consist of Regional Forest Development Departments and Regional Rural Forestry Departments.

The Provincial Office of Environment and Living Environment (DPECV) has been set up to decentralize the activities of the Environment and Forestry Department in provincial areas. Thus, the Provincial Office is responsible for enforcing the policies and programs of the Ministry at field level.

The Canton Office of the Environment and Living Environment Ministry (SDECV) is organized at Canton level as a subordinate organization of each DPECV. Forest agents are assigned to each Canton Office with one or more Cantons as the area for their activities. However, only one agent is assigned to each section, and they are not in a position to cover all issues arising in the entire province or region.

(4) Ministry of Economy and Development (MED)

The role of the Ministry of Economy and Development is as a coordinating agency for the implementation of projects. It acts as the secretariat for the Provincial Technical Conference (CCTP) and Provincial Committee for National Land Development (CPAT) as the coordinative contact for regional projects such as the National Program of Terroir Management II (PNGT II).

1) **Provincial Technical Conference (CCTP)**

The Provincial Governor is authorized to establish the Provisional Technical Conference (CCTP) as an agency to technically aid the Governor under the government ordinance relating to the application procedure of RAF (Law concerning Reorganization of Land and Agricultural Land). There is no agency with such a coordinating function at Canton level. The main role of the CCTP is to assess the development project plans and coordinate the development projects within the Province. Its organization differs slightly by Province, but normally, the Provincial Governor is assigned as Chairman and the Director of the Regional Economy and Development Department as Permanent Secretary General, and the other members are the Canton Governors, Directors of the Provincial Offices of each Ministry and the representatives of related projects, organizations and rural organizations. The Regional Economy and Development Department also functions as the permanent secretariat of the CCTP of each Province under its control.

The specific activities of the CCTP include holding the regular general assembly twice a year (as prescribed), as well as assessment of rural development programs and coordination in raising the funds required to implement the development programs after planning them.

PNGT II covers the entire country. Financial and technical assistance is provided for the

activities conducted under PNGT II and many training programs and workshops are held in the Provinces in which CCTP have been organized and are active. However, it cannot be said that the National Program is functioning well, because it is not easy to secure the funds necessary for such activities.

For instance, the activities conducted in 2003 in each Province in the Middle-North Region were limited to holding three general assemblies. In Bam Province, the CCTP was set up in 1999, but it is so sluggish that the first General Assembly in 2003 had on its agenda the subjects of revitalization of the CCTP and securing of financial sources. The CCTP in the Middle-North Region is conducting an inventory study to comprehensively monitor the on-going development projects in the region. However, only Bam Province completed the inventory and the studies in Sanmatenga and Namentenga Provinces are still under way.

2) Provincial Committee of National Land Development (CPAT)

The RAF stipulates that a Committee of National Land Development shall be established at national, regional and provincial levels.

In the Sahel Region, a master plan at regional level has been formulated and the environment for assessing development projects has been improved. The Provincial Committee of National Land Development (CPAT) holds regular meetings once every 3 months to make assessments and approve development project plans and coordinate the projects. However, coordination of the projects involves checking whether the projects are inconsistent with or duplicate existing laws or regulations, the master plan for regional or provincial development, or any other preceding development projects, and is not directly involved in coordination at the stage of implementing the projects according to the project plans.

Membership of the CPAT at the provincial level consists of delegates from the provincial administrative agencies, mayors and national diet members elected in the region or province concerned. So the CPAT lacks speed in the decision-making process. Fund-raising is another problem. The CPAT is not yet established as a system for promoting communication and coordination among the related members at the project implementation stage. No CPAT has been established in the Middle-North Region.

3.1.2 Programs in Experiment and Research Organizations

The Institute of Environment and Agricultural Research (INERA) and the National Bureau of Soil (BUNASOLS) are experiment and research organizations engaged in activities related to agricultural production.

(1) Institute of Environment and Agricultural Research (INERA)

INERA is a national research institute that was established in 1988 to conduct research for the agricultural, pastoral and sylvicultural industries and natural resource management.

Its main duties are to conduct all research and development of agriculture, stock raising and sylviculture as well as the environment, to spread the R&D results and to conduct monitoring surveys, and also to foster human resources for these and to promote the sustainable management

of natural resources.

In practice, INERA collaborates on Ministry of Agriculture, Hydraulics and Halieutic Resources or PNGT projects, and as a research institute provides agricultural development support including soil analysis and production of soil maps, and preparation of Fiche techniques (technical cards) to enable local agents to make effective use of the recommendations and R&D results relating to cultivation methods based on the results of soil analysis.

One of the present problems is that the techniques and cultivated varieties verified by INERA are difficult to introduce in rural areas where production takes place. The main cause of this problem lies in the closed nature of rural society and the promotion method, and especially in the inconsistency between the techniques being introduced and the needs in the field.

(2) National Bureau of Soil (BUNASOLS)

BUNASOLS is a public administrative institute that was established in 1982 under the joint control of the Ministry of Agriculture and Ministry of Economy and Finance. Its main duties include creation of soil distribution maps, soil analysis and soil and water conservation activities.

The present activities undertaken by the institute are mainly concentrated on creation of soil distribution maps and soil analysis, and it has not conducted any soil or water conservation activities. In future, BUNASOLS will carry out research in cooperation with the Vegetation Production Department of the Ministry of Agriculture, Hydraulics and Haliuetic Resources or with INERA, into the total area of degraded/corroded soil and soil and water conservation programs and cultivation methods appropriate for the decreased farmland area resulting from the increase in degraded/corroded soil.

3.1.3 Promotional Systems

(1) Agriculture Promotion System

1) Outline

In the Regional Department of Agriculture, Hydraulics and Halieutic Resources, there are 6 sections under the control of the Engineering Department, of which the Rural Society Extension and Guidance Section (SAC/MR) is in charge of promotion of agricultural techniques. SAC/MR comes under the control of the Provisional Office through the Educational Extension Chief and specialist technicians (TS) and provides support for agricultural technique extension and guidance to the technical support zones (ZAT) categorized by Canton and to the technical support units (UAT) for groups of villages. (See Fig. 3.1.3.)

The TS consist of specialist technicians in four fields: ① soil conservation and recovery, ② fostering of rural organizations, ③ vegetable production and ④ food techniques. However, there are many zones and units that have vacancies due to a shortage of technicians.

The agents assigned to each ZAT or UAT are called ZAT or UAT leaders and they are engaged in support activities for extension and guidance of agricultural techniques to rural

residents.

The ZAT leaders and the UAT leaders are incorporated into the hierarchical structure in this system, but in practice, due to the shortage of technicians, there are many cases in which ZAT leaders double as UAT leaders. However, because of the problem of means of transportation, support activities are limited to the villages in which the ZAT or UAT leaders reside and there exist many villages to which no technical guidance is extended.

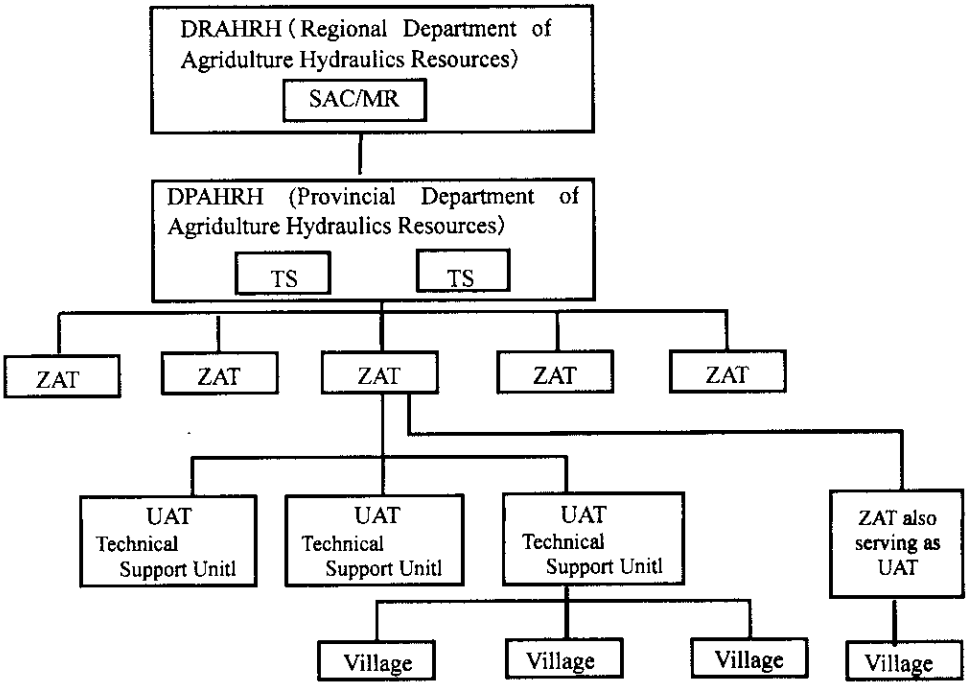


Figure 3.1.3 Agriculture Promotion System

The number of agents has been reduced in the framework of the structural adjustment program and the original hierarchical structure of ZATs and UATs is disappearing. As a result, these zones and units will be reorganized. In the process, each agent will be responsible for a larger area and the agent will have a larger burden. (See Fig. 3.1.4.)

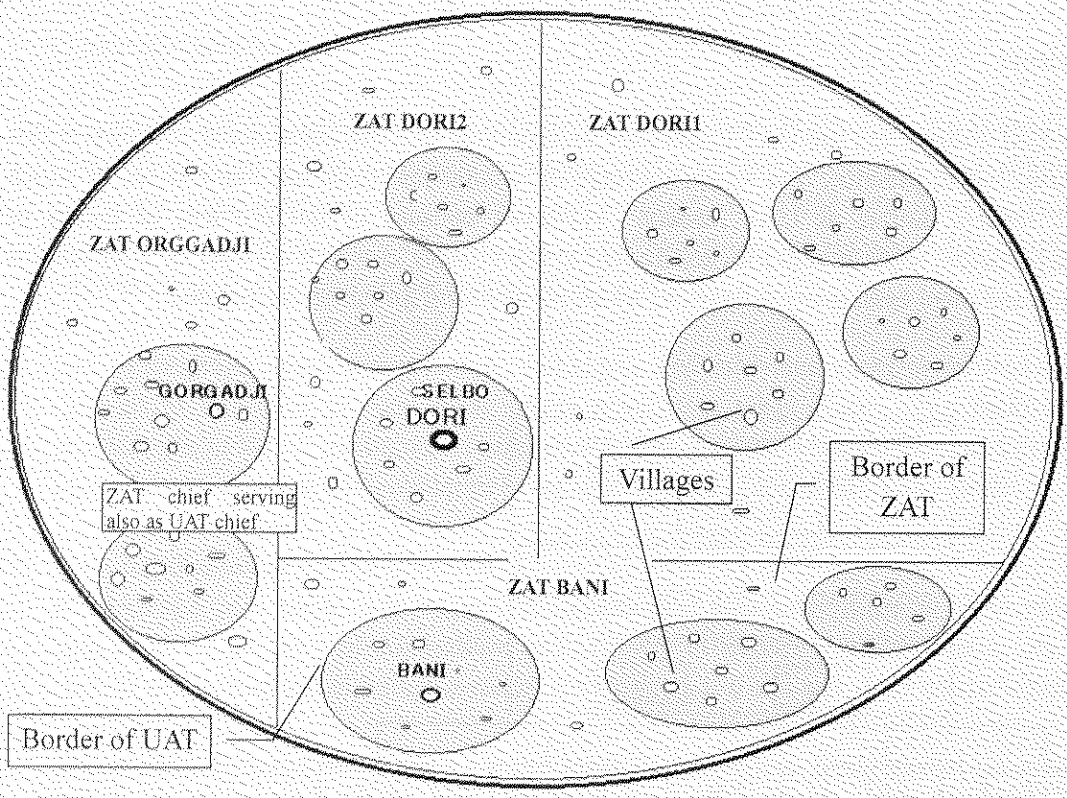


Figure 3.1.4 Diagram of Agricultural Extension System (SENO Province)

2) Themes for extension

The Ministry of Agriculture, Hydraulics and Halieutic Resources holds workshops to decide extension themes, plan programs and assess projects each year as follows:

① Each UAT assesses its activities together with producers (residents) and draws up a list of their needs to be reported to the ZAT to which it belongs.
② ZAT has meetings with UATs based on the reports made in ① which are screened, and the results are reported to the Provincial Office of Agriculture, Hydraulics and Halieutic Resources.
③ The Provincial Offices and Regional Departments of the Ministry of Agriculture, Hydraulics and Halieutic Resources have similar meetings to prepare a report to be submitted to the Extension, Research and Development Department of the Ministry.
④ The Extension, Research and Development Department holds workshops based on the reports from the Regional Departments throughout the country with the cooperation of aid agencies and prepares an assessment report on the busy farming period in the current year.

This series of tasks is conducted for the period from the end of November of each year to March of the next year.

The extension themes are decided taking into consideration the characteristics of each region or province and are divided into common themes and local themes.

Table 3.1.1 Technical Themes for Extension in Study Area

	Cultivation Techniques	Natural Resource Management	Producers' Organizations	Others
Common Themes	· Introduction of improved seeds · Seed processing · Use of farming equipment and materials · Use of improved varieties · Use of chemical pesticides and disinfecting tools · Protection against striga · Niébe storage · Nurseries and cultivation of vegetables	· Zai technique · Manufacture of organic fertilizers · Methods of using organic fertilizers · Establishment of vegetation zones · Regeneration of vegetation · Agro-forestry education	· Demonstrations, farmers verification test · Training by visits	· Guidance in processing and storage techniques for agricultural and livestock products
Middle-North Region	· Mechanical tillage and intertillage · Line seeding · Fix planting of tomatoes and onions · Fix planting of vegetable fields · Rice nurseries · Maintenance of machines · Multi-grass growing	· Protection against erosion · Eyebrow works	· Residents' enlightenment activities · Support of organizations for youths, exemplary farmers and newcomers · Support from start of cultivation to sale · Support of women and young producers	· Enlightenment activities with consideration for gender
Sahel Region	· Protection against harmful insects in niébe fields · Protection against raghuva · Storage of scaly onion stalks · Practical techniques for vegetable nurseries · Protection against rotting of tomatoes · Use of chemical fertilizers in irrigated rice farming · Protection against downy mildew · Measures against cantharides	· Stone-line installation technique · Ridging · Vegetation ridging · Gully protection · Recovery of grassland from glacis soil · Use of water · Installation of hedges	· Operation of economic units · Administrative operation of residents' organizations · Education of developed residents	· Soap manufacture · Operation of cereal banks

3) Activities of agents

The UAT leaders provide technical guidance directly to residents. Most adopt the method of organizing an agricultural group in each village, demonstrating techniques to the group on technical extension themes as described above, and going round visiting individual farmers. The ZAT leader controls a number of UATs and superintends the UAT leaders.

Once a month UAT and ZAT leaders visit the Provincial Office to which they belong to make their reports and receive advice and comments from administrative official(s) in the Provincial Office.

4) Activities to alleviate land degradation

The Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH) recommends

activities for conservation and improvement of farmland soil fertility as one of the programs for alleviation of land degradation. Measures against land erosion such as use of compost and natural phosphorus, zai and stone line works have been given priority as technical extension themes to alleviate land degradation.

Recently, there has been a campaign to make 200,000 compost tanks throughout the country of Burkina Faso by order of the President and it has increased residents' awareness of compost production and soil conservation. Soil fertilization using natural phosphorus found in Burkina Faso has also been recommended. However, such programs have not yet been extended nationwide because it takes a lot of effort to collect the production materials necessary for compost such as cattle dung and plant residue and it is also difficult to obtain natural phosphorus because of lack of water in dry season.

Measures against soil erosion have been undertaken by many NGOs and project implementers together with local residents. In particular, in the Middle-North Region, there have been many cases in which bare land has been recovered as farmland by means of stone lines, zai and eyebrow works, enabling farm products to be cultivated again.

(2) Stock-raising extension system

1) Outline

The departments and personnel engaged in the extension of stock raising are the Central Extension Department at national level, and the animal production specialist technicians (TS) assigned to the Provincial Offices and the leaders of stock-raising technical support zones (ZATE) in charge of Cantons at local level. However, few TSs have actually been assigned to provincial offices. As a rule, a veterinary group (PV) leader in charge of cattle hygiene is posted with the ZATE leader to each Canton, but in actual fact, in most cases one leader is posted to each Canton to serve as both ZATE leader and PV leader. Therefore, it is not unusual for PV leaders to carry out extension activities to support producers while ZATE leaders perform vaccinations.

There are about 100 posts for PV leaders and about 300 for ZATE leaders, but in practice only about 200 leaders have been assigned to these posts. There are many Cantons with no leader, so one ZATE leader (or PV leader) has to control several Cantons.

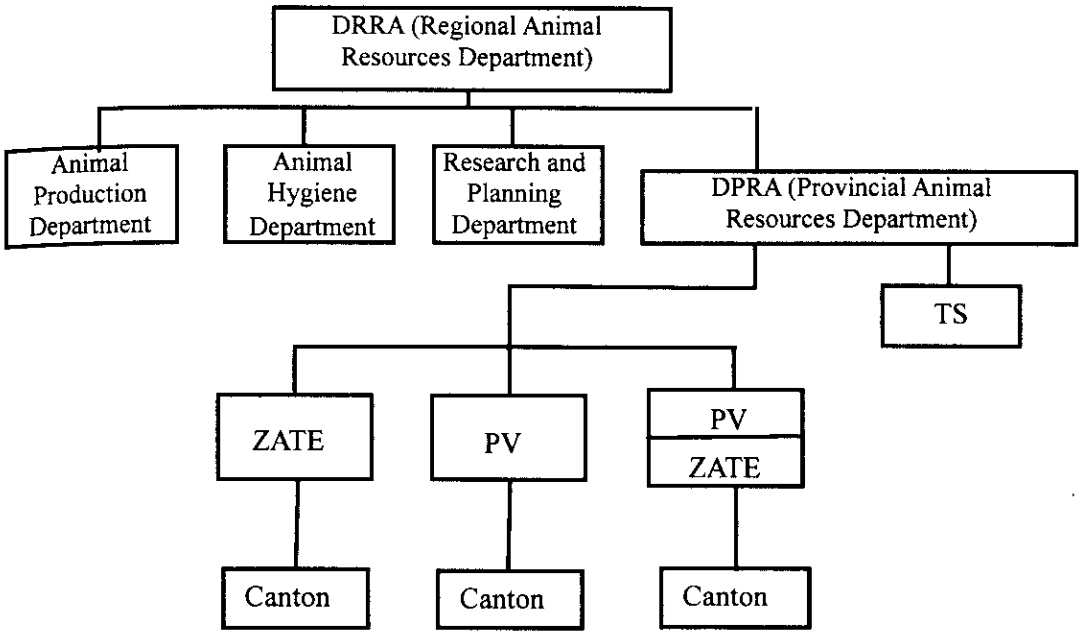


Figure 3.1.5 Stock-raising extension system

2) Extension themes

The extension themes handled by the Ministry of Animal Resources are determined each year in line with the needs of stock raisers. The procedure is as follows:

- Each Provincial Office assembles the activity plans and results from the previous year and formulates a draft activity plan for the year in question.
- The Regional Office collects these draft plans and submits them to the central government.
- The Ministry collects the draft plans from the 13 Regional Offices and draws up an official plan.
- However, if the Ministry determines that a different plan from the draft plans submitted by the Regional Offices should be implemented as a special important item, the Minister notifies the Regional Offices concerned by "letter of mission".
- The activity plans are prepared incorporating any ongoing aid programs or projects, NGO activities or support programs in the region concerned. (In other words, the plans are formulated based to some extent on aid programs.)

Important themes for extension activities include fodder production, hygienic management, construction of facilities such as cattle sheds, and technical guidance in milk processing.

3) Activities of agents

One of the normal activities of a ZATE leader is, among others, to provide training in sheep fattening, including guidance in fattening methods, types of fodder, extermination of parasitic insects and monitoring.

The PV leader is in charge of vaccination. There are mandatory items and demand-based items, for both of which stock-raisers bear the costs. For the mandatory items, the Central

Veterinary Department secures the vaccines and supplies them at fixed prices with a government subsidy.

The mandatory items vary depending on which diseases are prevalent each year, but diseases such as bovine contagious pleuropneumonia, hydrophobia (rabies), Newcastle disease which affects fowl, and bovine pest are specified as mandatory.

4) Activities for alleviation of land degradation

The Ministry of Animal Resources is engaged in the following activities as measures against the excessive grazing that is closely related to alleviation of land gradation in cooperation with the Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH) and the Ministry of Environment and Living Environment (MECV):

The main measures against excessive grazing are ① activities related to the stock-raising system and ② grassland management.

Activities related to the stock-raising system include enlightenment activities such as ① intensive stock-raising system, ② prevention of insect damage, ③ sheep fattening in sheds and ④ fodder supply (fodder cultivation and reaping of natural fodder), and ⑤ training in watching of cattle herds and transhumance without fixed grazing areas.

On the other hand, for grassland management, the following measures are taken: ① selection of protected districts for recovery of vegetation; ② seeding of fodder products such as andropogon; and ③ construction of drinking fountains and transhumance paths.

A request for control of farmland expansion (reduction of grasslands) through the advance of intensive agriculture has been submitted to MAHRH, and a request for prohibited entry of cattle into protected woods and an agreement for passage of large cattle herds through protected woods (between the Ministry and related residents) has been submitted to MECV.

The measures against excessive grazing in the Study Area have the following features:

In the Middle-North Region, there are few plain fields. Grasslands are provided in limited districts and cattle herds return to the villages after being grazed and fed with fodder in the provided grasslands.

In the Sahel Region, on the other hand, stock-raising villages and water supply facilities are located in the grasslands. A remarkable feature of the Sahel Region is its promotional activities for nomadic tribes: ① transhumance patterns are studied and extension campaigns are conducted during the period (July to September) when they stay within the jurisdictional districts; and ② information about the extension campaign is transmitted through radio broadcasts.

These measures are enforced within the framework of aid projects by PDL/S and PATECORE in the Middle-North Region.

5) Complementary activities for extension system

In the field of stock raising, the "New Approach to the Stock-Raising Extension System" was formulated in 2002 to complement the weak extension system. This attempt was aimed at improving the conventional procedure of implementing projects at the initiative of the administrative authority, and seeking the active participation of residents in all the processes of planning, implementation and assessment of projects. As for the content of the projects, a bottom-up approach is adopted in order to meet residents' needs. In addition, it has also been proposed that the extension activities undertaken by the administration (agents) be opened to private veterinarians, consultants and NGOs. This approach is still in the trial stage and is not enforced in practice.

Innovative aspects include: ① extension activities (producer support services) traditionally conducted by the administrative authority have been opened up to the private sector and the principle of competition between agents and private sector has been introduced; and ② the producers share part of the costs in order to receive producer support from the administrative authority.

At the present time, the balance of the producers' share will be borne by the Project Appui au développement rurale durable that is expected to be the successor to the PNDSA project.

(3) Forestry extension system

1) Outline

The department that administers and controls the extension services for forestry including reforestation activities is the Forestry Technique Extension Department (SVTF) organized within the Village Forestry Department of the General Department of Water and Forestry under the Ministry of Environment and Living Environment. However, its responsibilities are not yet clear although one year has passed since its reorganization. In fact, the policies for extension are not specified in practical detail and the services are not defined yet.

The National Forestry Policy (February 1998) defines its objectives as below, but the details of the extension items are not clearly specified:

① To define the positioning and role of forestry development to be implemented by the Ministry of Environment and Living Environment.
② To conduct resource management by a consistent, rational method with a synergistic effect among activists.
③ To promote legislation for resource management.
④ To provide the opportunity for discussion with persons concerned with development and the framework to govern the development.

At present, support is provided by the Village Forestry Department that has until now been related to extension services. Therefore, there is no department that specializes in extension in the regional organization system and no consistent extension system has been established.

The system in the Middle-North Regional Department is shown as an example in Fig. 3.1.6.

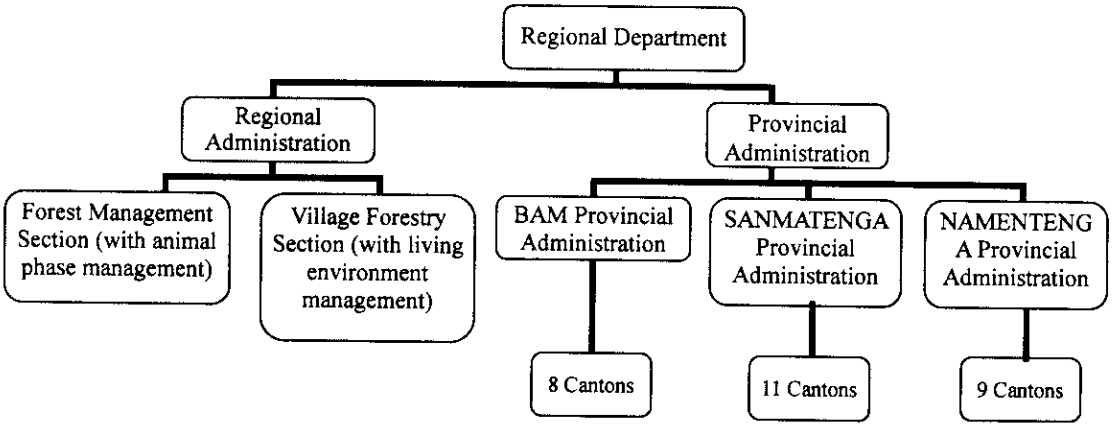


Figure 3.1.6 Organization of Middle-North Regional Environment and Living Environment Department

2) Activities of forest agents

The forest agents posted in each Province or its branch offices are responsible for forestry extension in the villages. However, the main activities of forest agents posted to provincial branch offices are enlightenment, training and technical extension for producers and residents with regard to firewood and marine and animal resources, issue of various permits to producers, and development regulations for protected forests. They are also responsible for enlightenment and extension activities related to forestry and environmental protection as well as acting as enforcement officials in each Canton. According to interviews with residents, they recognize the forest agents as enforcement officials, and some say that they have had no contact with them in enlightenment or extension activities and they keep way from the agents. It appears that recognition of the extension activities of the agents as well as the system for extension activities is weak. The activities of the Regional Department in the Study Area are described in Table 3.1.2 and Table 3.1.3.

31 public officials (engineers and administrators) are posted to the Middle-North Region and 36 to the Sahel Region, of whom 19 in the Middle-North Region and 23 in the Sahel Region are engaged in operations as forest agents at Canton level. In a simple calculation of the villages under the control of the agents, one forest agent controls 30 or more villages.

Table 3.1.2 Activities of Environment and Living Environment Departmentin the Middle-North Region

Activity	Theme/Contents
1. Enlightenment activity	· A total of 20,939 persons were enlightened in 3 provinces. · Rational management and protection of forest resources, introduction of agro-forestry reforestation techniques and production of Arabian rubber.
2. Training	· Residents and agents are trained. · 26 themes including seedling production techniques, fruit tree production and grafting techniques, and improved oven manufacture
3. Activities including reforestation surveys and conservation	· Technical support for reforestation activities. Survival rate: 40 to 50% (14 villages in Pissila Canton) · A total land area of 12.5ha in 8 villages in Nanmetenga Province was readjusted as protected zones. · 2,303 trees were planted for fertilization in 4 village forests in Sanmatenga Province. · Promotion of natural forest renewal and control during cultivation.
4. Wood and energy programs	· Extension of improved ovens and survey of wood consumption
5. Natural forest rehabilitation programs	· RPTES[2] project conducted a field reconnaissance of the protected forests in Yabo and Korbo districts in cooperation with the forest agents in Sanmatenga Provincial Office and analyzed the actual conditions using the PRA method together with local residents.

Table 3.1.3 Activities of Environment and Living Environment Departmentin the Sahel Region

Activity	Theme/Contents
1. Enlightenment activity	· A total of 3,909 persons in 4 Provinces were enlightened within the framework of PSB with the assistance of GTZ, DANIDA and the Netherlands. · 11 themes including rational management and protection of forest resources, preparation of seedling production, and management of soil degraded districts
2. Training	1) Training of agents · A total of 44 agents were trained on 8 themes including PRA guidance (DANIDA) and mother tree management techniques (GTZ). 2) Training of local residents · A total 1,876 persons were trained on 14 themes including protection of naturally renewed young trees and cutting techniques during cultivation (GTZ), seedling production techniques (GTZ, DANIDA, FENU), seed germination acceleration and direct seeding (ADRA).
3. Activities including reforestation surveys and conservation	· Survival rate: 47.76% (110,000 of 230,314 trees planted survived) · Confirmation of rules of natural resource management (DANIDA, Seno and Yagha Provinces) · Credit (fund) by GCP[3] project
4. Arabian rubber production	· Promotion and reinforcement of Arabian rubber production in a total area of 350ha in 3 Provinces (except Oudalan) in the Arabian rubber project for local resident groups
5. Natural forest rehabilitation programs	· Bare land recovery by mechanical cultivation for natural forest rehabilitation in a total area of 235ha in 16 forests in 3 Provinces (except Yagha)

[2] Review of policy on traditional energy sector
[3] Project Gestion de crédite

(4) State of agent assignments

The state of assignment of staff and agents of provincial offices in the Study Area is summarized in Table 3.1.4.

Table 3.1.4 Assignment of staff and agents of Provincial Offices in the Study Area(As of January 2003)

Ministry of Agriculture, Hydraulics and Halieutic Resources

REGION	PROVINCE	STAFF	Tech	ZAT	*1	UAT	Vacancies	Canton	Village	*2
Middle-North	BAM	7	5	7	7	7	0	9	241	17
	SANMATENGA	6	5	7(8)	5	13	3	11	317	19
	NAMENTENGA	5	4	6	5	12	1	8	158	9
Sahel	SENO	5	4	2(3)	0	10	2	6	200	17
	YAGHA	4	3	3	3	5	2	6	108	14
	SOUM	34	33	6	2	24	3	9	159	5
	OUDALAN	14	13	3	3	5	2	5	155	19

Tech: Technical staff (excl. Office Chief)

*1: The number of ZAT leaders serving as UAT leaders *2: The number of villages per agent (estimated)

Ministry of Animal Resources

REGION	PROVINCE	STAFF	Tech	ZATE	PV
Middle-North	BAM	1	0	4	5
	SANMATENGA	4	3	5	3
	NAMENTENGA	3	2	8	3
Sahel	SENO	2	1	5	2
	YAGHA	3	1	2	3
	SOUM	9	8	8	3(9)
	OUDALAN	7	6	2	3

Tech: Technical staff members (excl. Office Chief)

PV: Poste Vétérinaires (veterinary group)

Ministry of Environment and Living Environment

REGION	PROVINCE	STAFF	Tech	SDECV	PF
Middle-North	BAM	2	1	6	0
	SANMATENGA	4	3	9	1
	NAMENTENGA	2	1	4	0
Sahel	SENO	1	0	6	0
	YAGHA	1	0	5	0
	SOUM	3	2	7	0
	OUDALAN	6	5	5	0

Tech: Technical staff members (excl. Office Chief)

SDECV: Service Département aux de l'Environnement et du Cadre de Vie

PF : Poste Forestier (Forest agent group)

※The figures in ( ) in each table denote the number of posts, and the numbers of cantons and villages are indicated as of January 2003 by the Agricultural Extension Department of the Ministry of Agriculture, Hydraulics and Halieutic Resources.

As shown in Table 3.1.4, one agricultural agent controls about 5 to 20 villages, one forest agent about 30 villages, and one stock-raising agent about 20 to 40 villages.

In particular, the number of villages controlled by one agricultural agent who constitutes the key element in the extension project in the Study Area is 10 or more in most Provinces. Considering

that the number of villages which one agent can go round and provide effective guidance to is about 4 to 6 villages, it is clear that there is a great shortage of agents.

(5) Reduction of agents

At present, the number of agents is decreasing in the Ministry of Agriculture, Hydraulics and Halieutic Resources as a result of the structural reform program. The state of reduction is as follows:

① Employment of new agents was terminated in 1993 and thereafter, the number of agents decreased substantially because of age, death and retirement.
② A survey of the state of reduction among public officials was made in 1999 focusing on the agents. There were 1,438 agents nationwide under the control of the Extension, Research and Development Section of the Agricultural Extension Department in the former Ministry of Agriculture. In the Study Area, 67 agents in the Middle-North Region and 44 agents in the Sahel Region have retired since 1993. As the result, the number of agents in each of these Regions fell to 86 and 77 respectively.
③ If no new agents are employed for the period from 2000 to 2005, it is estimated that the number of agents will fall 38% (546 agents) to 892 in 2005, and the average age of the agents will be 46.
④ The Agricultural Extension Department employed 18 agricultural technicians for small-scale irrigation on single-year contracts (renewable) in 2001. The technicians include graduates from vocational training schools and technicians trained by NGOs, consultants and the Agricultural Extension Department.
⑤ 20 agents were employed for technical guidance in irrigation in 2002.

In the stock-raising field, as described above, the ZATE leaders in most Cantons double as PV leaders and in practice conduct both extension and quarantine activities because of the shortage of personnel. However, there was no new employment of public officials until 2000 after being terminated in 1993 in the era of the Ministry of Agriculture and Stock Raising. It was resumed in 2001, but only 30 officials were employed each year, and this was not enough to make up for the decrease due to retirement and death. This trend toward reduction of agents is expected to continue in future. In a trial estimation, 38% of the agents will have retired by 2005, resulting in a yet more serious shortage of agents.

Since employment is controlled by the national authority, there is no employment that takes into consideration local characteristics such as, for example, assignment of agents proficient in the Foulfoulde language to the Sahel Region.

(6) State of activities of agents

1) Role as contact between the administration and residents

The agents are positioned at the forefront of the local organizations in each technical agency and they conduct dialog and exchange of information with local residents through their technical extension activities. In the implementation of agricultural, pastoral and sylvicultural development projects, they are in a position to play the role of mediator with residents as the contact point of the administration. They not only provide guidance in various techniques to residents, but also play a role in monitoring residents' intentions with

regard to production activities and on-site conditions and reporting the results to the regional organizations.

In the present circumstances, however, there is not only a shortage of agents as described above, but often the assigned agents or forest agents cannot understand the main languages in the areas where they work (for example, Foulfoulde in the Sahel Region), resulting in difficulties in communication with residents. In this case, the agents cannot serve as the administrative contact or ascertain the actual conditions of the villages.

On the other hand, if residents want to request the administration for support, it is not clear what agency or whom they should contact to realize their request. Therefore, the agents are also required to serve as contacts for the support of residents.

2) Transportation means and project dependency

The means and cost of transportation for agents to go round the villages and provide guidance are also limited.

Until 2001, agents were supplied with motorcycles under the National Program for Agricultural Activity Development Phase 2 (PNDSA II) by the World Bank (IBRD). In addition, each UAT leader was paid 35,000FCFA[4] per month as an allowance, which was later reduced to 12,500FCFA per month. In June 2003, PNDSA II ended and payment of the allowance was also stopped. In these circumstances, it is difficult for agricultural agents to go round the villages to give guidance. Instead, the agents provide technical guidance whenever farmers visit them.

As described above, the project implementers have given pays to agents, but the agents have lost their consciousness of the original significance of the rural development projects that are implemented for the sake of their villages or residents. They have been apt to participate in implementation of the projects for getting pays.

3) Extension tools

Agents undertake activities for technical guidance and extension based on the knowledge and experience that they have acquired from the textbooks used in their technical colleges or schools or from participating in the seminars provided in various projects by donors. However, existing textbooks contain old or obsolete techniques or are inappropriate to their areas, so they are not widely used at agent level:

Furthermore, the departments or sections that are responsible for technical extension are required to have audiovisual equipment such as video units, which they are not provided with. If the agents provide technical guidance to residents who have insufficient technical knowledge or lack literacy in their mother language, this is also an obstacle to conducting effective extension activities.

[4] The exchange rate as standard is: 1euro = 655.957FCFA ≒ 131.52 yen (as of February 1, 2004)

(7) Agents' ability enhancement program

The training required for enhancing agents' abilities consists of a technical course and a course in fostering their ability to enlighten residents, the leading methodology adopted in recent years.

In the past, agents' activities have been aimed mainly at extending and providing guidance in techniques in accordance with policies advocated by the national government, and technical training has been provided by each Ministry. However, the importance of bottom-up development, in which residents participate in projects on their own initiative, has been recognized in recent years and agents need to have the ability to enlighten and organize residents. At present, however, agents have little opportunity to receive training in such methodology and there is little recognition that such ability is required for agents.

1) Regional Department of Agriculture, Hydraulics and Halieutic Resources (DRAHRH)

At present, opportunities for enhancing the technical ability of agents are afforded by ① monthly briefing sessions at provincial office level and ② technical training provided by each project for which DRAHRH is responsible.

In the meetings in ①, staff members of the Provincial Office and agents including UAT and ZAT leaders gather to exchange information and opinions on technical and organizational issues. A number of TSs have been posted to Provincial Offices and they also offer technical advice to ZAT and UAT leaders. These meetings are briefing sessions, but they contribute to enhancing the technical ability of agents.

The training in ② is planned and carried out project by project, so it is limited to the agents or staff members of regional departments and provincial offices that are involved in the project in question. The training is often conducted for one to two weeks before the start of the project. Some projects plan training courses outside Burkina Faso, but the participants in such training courses are disproportionately staff members from national and regional agencies, so the results of the training rarely contribute to technical extension in the field.

2) Regional Department of Animal Resources (DRRA)

The training of agents is undertaken by specialist technicians (TS) posted to each Provincial Office. The training is conducted on themes based on the demands of agents and the latest research results in experimental and research institutes. In short, the flow of technical extension is from experimental and research institutes → TS → agents → producers.

Important themes for extension differ from region to region, so the contents and frequency of training courses also vary depending on the respective Regional Department.

Monthly technical review workshops were held until 2000 to provide a regular opportunity for enhancing the technical ability of agents, but no workshops are held at present because of budget shortages. Training is provided sporadically with support from the project side.

3) Regional Department of Environment and Living Environment (DRECV)

Regional Environment and Forest Departments (DREEF) provide training and education for their staff members (forest agents) and residents every year, but the training programs are

often conducted jointly with projects undertaken by other donors due to lack of financial resources in the regional departments. Therefore, the opportunity for forest agents to receive training depends on the number of forestry-related projects implemented.

In such training, the role of each Regional Department is to take overall responsibility for the training, while the number of participants and the content of the training program are determined on the project side that planned the training.

The actual number of participants and the main content of training courses for on-site forest agents from Regional Environment and Forest Departments in both the Middle-North Region and the Sahel Region in 2000 and 2001 are shown in Table 3.1.5.

Table 3.1.5 Participation in Training Courses by Forest Agentsfrom Regional Environment and Forest Departments

Region	Total number of participants		Donor	Content
	2000	2001		
Middle-North	-	34	PS-CES/AGF[5], PSB-GTZ, PSB-DANIDA, etc.	Introduction of PRA method, budget management, mother tree management, clay pot manufacture/planting techniques
Sahel	44	73		

Note: Data for the Middle-North Region Environment and Forest Department in 2000 was not available.

4) Measures for enhancement of agents' ability by experiment and research institutes

(a) Institute of Environment and Agricultural Research (INERA)

The Institute of Environment and Agricultural Research (INERA) currently provides training only when requested to do so by the project or NGO.

Until 2 years ago INERA held monthly workshops within the framework of the National Program of Agricultural Service Development (PNDSA) to transfer technologies to and exchange information with agents. In these workshops, INERA researchers visited each Regional Department monthly to transfer information on new technologies to TSs in each province in the department's jurisdiction, and to exchange views and information and conduct field reconnaissance surveys. The technologies developed by INERA were transferred to TSs through the workshops, so the TSs could transfer the technologies to ZAT and UAT leaders and thence to farmers. INERA researchers could also ensure that local input was reflected in their research. However, no workshops are held at present because of lack of funds.

(b) National Bureau of Soil (BUNASOLS)

Like INERA, the National Bureau of Soil (BUNASOLS) sometimes dispatches its researchers to Regional Departments at their request to provide training for the agents in their jurisdiction, but this is not provided on a regular basis. On the other hand, researchers are dispatched to agricultural technician training schools and universities in Ouagadougou and Bobo-Dioulasso to receive lectures on pedology, topography and analytical experiments, contributing to the fostering of agents.

[5] Special Program for Central Plateau Soil/Water Conservation and Agro-forestry

(c) National Forest Seeds Center (CNSF)

The National Forest Seeds Center (CNSF) provides technical training for residents and forest agents. Technicians from the Education and Extension Department of CNSF are in charge of the technical training that is conducted every year.

The content of the training program is not limited to the production and control of seeds, but covers a wide range including planting techniques and clay pot manufacture.

In order to implement the training program at regional level, CNSF has set up 4 Regional Forest Seeds Sub-centers as regional branches around the country. The main activities of the Sub-centers are technical training of seedling producers and technical advice to on-site forest agents in cooperation with Regional Environment and Forest Departments. Sub-centers have been set up in Kaya and Dori in the Study Area.

Table 3.1.6 Content of CNSF Technical Training (Actual data for 2001)

Region	Participants	Content	Place	No. of People	Donor
Sahel	Residents	Re-training in seed/ seedling production techniques	Dori	52	PGRN-SY
	Residents	- ditto -	Sebba	52	
Middle-North	Forest agents	Clay pot manufacture/ planting techniques	Kaya	14	PS-CES/AGF
	Residents	-ditto-	Kaya	16	

3.1.4 Summary of Problems

① Policies relating to programs to alleviate land degradation were formerly mapped out by the National Council for Environmental Management[6] (CONAGESE), but CONAGESE has been reorganized as the National Committee for Environment and Sustainable Development (CCONEDD) and currently each Ministry formulates its own policies.

② Effective implementation of the programs to alleviate land degradation requires a coherent approach at national level. However, the agricultural, stock-raising and sylvicultural sector is divided among three Ministries and agents belonging to each Ministry conduct their activities separately in accordance with the policies of the Ministry. The Ministry of Economy and Development has set up CCTP and CPAT organizations to consolidate these individual activities and promote collaboration and coordination at provincial level, but they cannot be said to be functioning satisfactorily due to lack of financial resources. Collaboration and coordination have not been accomplished at Canton level.

③ The Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH) has been promoting reorganization based on structural reform, but no staff members have been assigned to some departments or sections and completion of the system to implement existing services using private initiative is behind schedule because of financial difficulties. As a result, the technical services demanded by residents are not fully available.

④ Agents are not fulfilling their role as contacts for residents because of problems such as the

[6] In order to formulate a National Action Program for the Alleviation of Land Degradation, the National Council for Environmental Management (CONAGESE) was established in September 1995 and later bore an important role in measures for the alleviation of land degradation.

language used in extension activities and lack of personnel.

⑤ Motorcycles are the means of transportation for agents, but they are insufficient in number and the fuel necessary to run them cannot be obtained.

⑥ There are insufficient extension tools such as textbooks and visual teaching materials for efficient extension activities.

⑦ In many cases agents are also in charge of implementing aid projects supported by donors or NGOs, but often they only attach importance to getting their pay from the project implementers and do not understand the essential significance of implementing the projects.

⑧ Until now, development projects have been implemented on a top-down basis on the initiative of the administration. Therefore, the agents have not fully recognized how important it is for sustainable rural development to positively enlighten and organize residents.

⑨ Technical training has not been provided on a regular basis, so the technical ability of the agents is unsatisfactory.

⑩ Research institutes should be recognized as organizations that conduct research into technical issues and joint research with other countries. However, they have no know-how or expertise in practical techniques suitable for residents or the methodology to extend techniques to residents. It is necessary, therefore, to develop the extension methodology.

3.2 Residents and Agricultural Organizations

3.2.1 Residents' Awareness and Ability

Many projects have been implemented in Burkina Faso in the past. The methodology of implementing these projects has changed in recent years from a top-down system, in which the national government takes the initiative in planning and implementing projects, to a bottom-up system based on the participation of residents. To demonstrate the effectiveness of projects in a sustainable manner using the bottom-up system, residents' awareness must be changed and their abilities enhanced with regard to the following points .

(1) Willingness to participate in development projects

Residents as well as the administration have been accustomed to top-down type development projects for many years. Residents thought that rural development projects for their benefit should be implemented by the government or aid agencies rather than by themselves and their general attitude was to wait for external aid. As an extreme example, when a resident of a certain village was requested to distribute copies of a development master plan prepared in the process of establishing a CVGT (Terroir Management Committee), he replied that the copies would be used "to seek aid by showing the plan to aid agencies".

(2) Approach to consensus building

Rural development projects implemented in villages as measures to alleviate land degradation through appropriate management and use of resources should be for the general benefit of all the residents and should encourage consensus building without profiting only some of the residents or organizations in the village. Efforts to organize residents in order to gather all their opinions and form a consensus in the villages are gradually being promoted in the form of establishing CVGTs based on PNGT or other programs, but the results, including extension to other villages, are still

inadequate.

(3) Communication among residents

In the villages in the Study Area, there exist many disparities, including complicated differences in historical background (such as bondage), discord between permanent residents and nomads, differences between vocational groups and between men and women based on traditional values. To resolve these disparities and gather all their opinions in order to achieve better communication among residents, it is important to enhance their organizational abilities and improve their literacy. However, few villages have taken measures to enhance these abilities.

(4) Facility management ability

There are cases in which the facilities granted in development projects require operation and maintenance beyond residents' ability. Cases vary, with some where the residents' side desire facilities requiring management techniques beyond their abilities, and some where no management or operation system has been established. This kind of problem should be avoided primarily by the aid organization ascertaining details of the actual conditions in the villages and the residents' abilities.

However, in general, residents' ability to manage and operate such facilities is not at a high enough level in terms of both hardware (operation and repair of the facilities) and software (collection of operating costs and operation of the facilities). Therefore, it is necessary to evaluate residents' abilities in management and operation and improve their operating ability before implementing a project, and to consider a follow-up program after completion of the project.

3.2.2 Establishment of Regional Chamber of Agriculture (CRA)

In Burkina Faso, Regional Chambers of Agriculture (CRA) consisting of representatives of agricultural, stock-raising and sylvicultural producers at village level began to be organized in 2002 on the initiative of the Department of Producer Organizations/Rural Organization Support (DOPAIR) of the Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH) with the support of the World Bank (IBRD).

(1) Background of CRA establishment

In development activities relating to agriculture, stock raising and sylviculture, support such as technical guidance and provision of equipment and materials has been provided under a top-down system in which policies are passed down from national level through regional and provincial levels to the producers. However, this system has not produced any major results such as an increase in agricultural production. The main reason for the unsuccessful results lies in the fact that the extension techniques and support are incompatible with the natural environment and the intentions of the producers, in other words, they lack on-site adaptability.

Many development projects in the agricultural, stock-raising and sylvicultural sector have been implemented with domestic and foreign assistance in the past and many committees and councils made up of residents and administrative officers have been set up for each project. However, each project has had a high degree of independence from other projects and there have been few

tie-ups with other projects or administrative agencies, resulting in duplicated or wasted development activities.

(2) Objectives of CRA establishment

The establishment of a Regional Chamber of Agriculture (CRA) was planned against the above background with the following objectives.

① To transmit the intentions of producers to national and foreign aid projects and NGOs through a representative from each administrative division and to reflect the actual conditions of the villages in agricultural policies and development activities.
② To actually participate in agricultural development and other projects as the agency representing the residents in each administrative division.
③ To play the role of a medium in technical extension by linking agents and producers.

(3) Organization and election procedure

As for the structure of the Regional Chamber of Agriculture (CRA), an executive conference is organized not only at regional organization level, but at all levels from village to national level. (Refer to Fig. 3.2.1 Organizational Chart of CRA, and to Appendix 3.4 Selection of the representatives.)

(4) Past course of events and progress

It was planned to establish a Regional Chamber of Agriculture in each region in 2002, but the plan was postponed until 2003 because of lack of budget appropriation. In the second half of 2003, elections for the executive board were held in each region. CRAs were officially established in some regions at the end of September 2003.

CRAs will be subsidized by the national government for the next 5 years.

(5) Future activities in this Study

The Ministry of Agriculture, Hydraulics and Halieutic Resources also expects CRAs to contribute greatly to agricultural development if these organizations gain momentum as a vehicle for reinforcing the partnership between residents and the administration at village level.

On the other hand, it has been the case up to now that even if an organization was set up, its activities were apt to stagnate due to lack of funds. Grant aid was received from the World Bank for establishing CRAs in each region, but the national government lacks ample funds and is concerned whether the available budget will cover the operating costs of the CRAs.

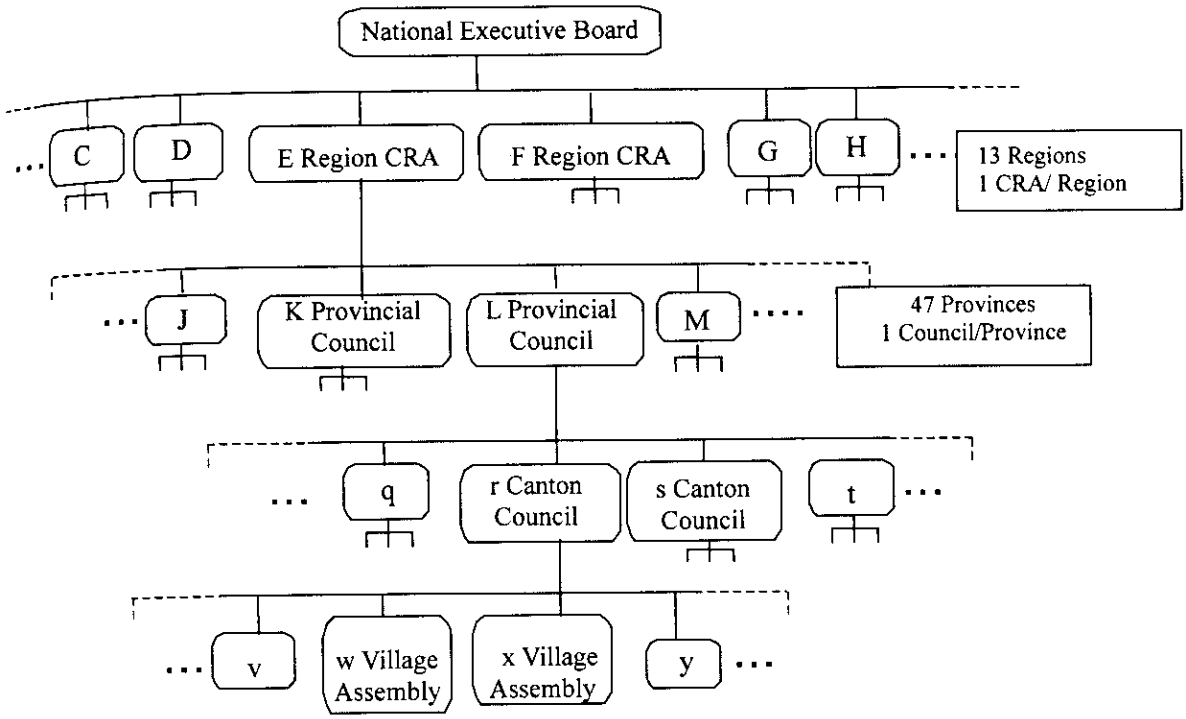


Figure 3.2.1 Organizational Chart of Regional Chamber of Agriculture

3.2.3 Summary of Problems

① In implementing measures to alleviate land degradation in a sustainable way, it is necessary to move away from administrative initiatives and foster the sense that the residents are the lead players in actively undertaking rural development. It is also necessary to shift away from administration- or donor-driven activities to activities initiated by the residents.

② There is no mechanism for enabling smooth communication among residents or promoting consensus building, so measures to alleviate land degradation cannot be determined as most residents desire.

③ The aim of establishing Regional Chambers of Agriculture is to promote rural development by residents organizing themselves, and this is expected to happen. However, there are many uncertain factors at this moment regarding whether the CRA can function as originally intended in the light of problems such as funding of its activities.

3.3 Project Implementation Systems of International Organizations

The Government of Burkina Faso has implemented a number of programs and projects including increase of food production, land management and resources development with the assistance of FAO, IBRD, GTZ and others. FAO and IBRD have been active in this country for 30 years or more and have accumulated a wide range of know-how and experience.

In the Study Area, there are many ongoing projects being undertaken by related Ministries. An implementation system for this Study will be considered after selecting a number of projects implemented by international organizations, including PNGT II which is under the control of the

Ministry of Agriculture, Hydraulics and Halieutic Resources, and analyzing their implementation systems and problems.

The implementation systems of the selected projects are summarized in Table 3.3.1. The details of implementation are described in Appendix 3.5.

In addition to the 8 projects described in Table 3.3.1, there are other ongoing projects: PATECORE[7] (GTZ), PDRI[8]/NAMENTANGA (OPEP, BID) and PADL[9]/Bam-Yatenga (AFD, FFEM) under the control of the Ministry of Agriculture, Hydraulics and Halieutic Resources, the Regional Nursery Rehabilitation Project (PRPR, Japan) under the Ministry of Environment and Living Environment, and PDES II (BAD) under the Ministry of Animal Resources. The implementation system of this Study is also described therein as reference for comparison with the projects of other donors.

Donors who are providing assistance over the long term are worried about how to implement their projects and are changing their methods of approach. The actual conditions and problems of the project implementation systems are summarized below.

① In an overview of the project implementation systems, the canton and village levels on the administration side, and especially the agents, are not in a position to bear responsibility for rural development, but are in charge of supporting technical issues and extending national policies. Support for residents is provided by animators employed by the project implementers. The reason for this is the lack of a means of transportation (motorcycles) for agents to maintain contact with residents and lack of fuel.

② Since the project implementation systems are determined in accordance with the intentions of the aid organizations and the policies of the related Ministries, they have not been implemented systematically and in a consistent manner. Therefore, there has been a lack of mutual cooperative tie-ups in the agricultural, stock-raising and sylvicultural fields due to the vertical administrative system and there has been insufficient feedback from successful examples of preceding projects to ongoing projects.

③ Village Committees of Terroir Management (CVGT) were established at village level under the Joint Ministerial Ordinance proclaimed in February 2000, and many donors are bringing up the subject of CVGTs in their discussions with regard to their project activities. However, the literacy rate of the residents who make up the CVGTs is so low that donors are spending time on enlightenment activities and training courses to enhance residents' ability. In addition, residents' understanding of the aims of the CVGT is still inadequate.

④ There are no projects that have been or are being implemented with a budget from the Government of Burkina Faso. To continue these activities, the donor side has to cover all the costs including personnel expenses. No budgeting steps or measures to support such steps have been taken by the government.

[7] Projet d'aménagement des terroirs et de conservation des resources dans le Plateau central
[8] Projet de développement rural intégré
[9] Projet d'appui au développement local

Table 3.3.1 Project Implementation Systems of International Organizations

No.	Program or project (period)	Aid organization	Ministry and Department in charge	Committee or conference at each level (*1)				Organization utilized for support, etc.	Supported organization
				National	Regional	Provincial	Canton		
1	Special Program for Food Security (PSSA) (1997-2001: 15 years)	FAO	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), Minister's Secretariat (SG)	Steering Committee (CP)	Regional Technical Committee (CCR)	None	None	Moroccan technicians and their C/P (agriculture, fishery and sylviculture, stock raising)	Rural Technical Conference (CLC), Rural Group (GP), Terroir Management Committee (CVGT)
				Four national coordinators Technical Committee of each Ministry (CTI)	(Two regional coordinators)	PSSA office			
2	Phase II of the National Program of Terroir Management (PNGT II) (2002-2016: 15 years	IBRD (IDA)	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), Minister's Secretariat (SG)	None	None	Provincial Technical Conference (CCTP) is used.	None	Engineers from administrative organizations, agents, NGOs, associations, private companies	CVGT, Terroir Management Committee for Multiple Villages (CIVGT)
				PNGT office		PNGT office			
3	Sahel-Burkina Program (PSB) (1989-2004: 15 years)	GTZ (UNDP Netherlands, Denmark, African Development Bank)	Permanent Secretariat of National Council for Environmental Management (SP/CONAGESE)	None	Regional Conference Unit (CRC)	Coordination Team (EP)	Canton Conference Unit (CDC)	NGOs, agents, aid organizations	Conference (CC), CVGT, CIVGT
				National PSB coordinator	PSB office	Provincial Technical Conference (CCTP)			
4	Agricultural and Stock Raising Resources Development Program in Namentenga Province (PAPNA) (2000-2005: 5 years)	UNDP	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), Minister's Secretariat (SG)	Tripartite Meeting	None	Provincial Technical Conference (CCTP)	None	Project-employed animators assigned and NGOs, private companies	CIVGT and rural communes (Commune Management Committee: CCG)
						PAPNA office	Fund Allocation Committee (CAF)		

*1 The upper column shows steering committees made up of the organizations concerned. The lower column shows organizations established under programs and projects for approving plans or executing budgets.

No.	Program or project (period)	Aid organization	Ministry and Department in charge	Committee or conference at each level (*1)				Organization utilized for support, etc.	Supported organization
				National	Regional	Provincial	Canton		
5	Regional Development Program in Sanmatenga Province (PDL/S) (2002-2006: 5 years)	Netherlands	Ministry of Development and Economy (MED), Department General of Economy and Planning (DGEP)	CP	None	CCTP	None	Three consultants (animators assigned), and administrative organizations and private companies, etc.	CVGT
						Provincial Management Committee (CPG), Management Technology Center (CTG) PDL/S office	Canton Management Committee (CDP)		
6	Special Agro-forestry Program for Soil and Water Conservation on Central Plateau (PS-CES/AGF) (1988-2003: 15 years)	FIDA, BOAD	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH)	None	None	None	None	Agents, NGOs, private companies	Resident organizations such as CVGT
				Supervisory Committee Programming Workshop	Regional Committee (unofficial)	Provincial Committee (unofficial)			
7	Phase II of the National Program for Agricultural Service Development (PNDSA II) (1998-2001: 4 years)	IRBD (IDA)	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), Ministry of Animal Resources (MRA)	PNDSA Coordination Unit	None	Provincial Conference and Opinion Exchange Meeting of Rural Organizations (9 provinces) (CPCE/OP)	None	Engineers from administrative organizations, agents, NGOs, associations, private companies	Resident organizations and groups such as CVGT and CIVGT
	Extension of PNDSA II (2002-June 2003: 1.5 years)	IRBD (IDA)	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH), Ministry of Animal Resources (MRA)	PNDSA Coordination Unit	None	Provincial Conference and Opinion Exchange Meeting of Rural Organizations (9 cantons) (CPCE/OP)	None	Agents, NGOs, associations, private companies	Resident organizations such as CVGT and CIVGT, producer organizations (OP)
				National Committee of Project Legislation	Regional Committee of Project Selection (CRVP)	Provincial Committee of Project Selection (CPVP)			

*1 The upper column shows steering committees made up of the organizations concerned. The lower column shows organizations established under programs and projects for approving plans or executing budgets.

No.	Program or project (period)	Aid organization	Ministry and Department in charge	Committee or conference at each level (*1)				Organization utilized for support, etc.	Supported organization
				National	Regional	Provincial	Canton		
8	Greenbelt Program (PFT) (1998-2007: 10 years)	Taiwan (PHASE I ended in 2003)	Ministry of Environment and Living Environment (MECV) Village Forestry Department (DFR)	CP	None	None	None	Directly controlled by Ministry	Committee for Management of Recovered Land (CVGS)
				PFT office		Provincial Forestry Department			
Reference	Review of Study on System to Alleviate Land Degradation (Phase I) (2000-2003: 3 years)	JICA	Ministry of Agriculture, Hydraulics and Halieutic Resources (MAHRH) Research and Planning Department (DEP)	Steering Committee (CP) (presided over by Director General)		UCADR leader's explanation to CCTP	Rural Development Activity Coordination Unit (UCADR)	Administration: Administrator Technology: Agents, forest agents Implementation: NGOs, private companies	4 CVGTs
					JICA Study Team				

*1 The upper column shows steering committees made up of the organizations concerned. The lower column shows organizations established under programs and projects for approving plans or executing budgets.

3.4 NGO

3.4.1 NGOs in Burkina Faso

Many of the NGOs in Burkina Faso were founded on the occasion of a great drought that started around 1969. The role of these NGOs at that time was mainly to provide support for emergency food aid from abroad. In the 1980s, the Government adopted the strategy of development through residents' participation to give the NGOs a more important role to play. Since 1983, NGO activity programs have been contained in the National Development Plan. As a result, the role of NGOs has shifted from their conventional function of extending the resources and services provided by governmental agencies and aid organizations widely to residents, toward support for independent rural development, and has further expanded to include the function of reconciling the interests of local residents in order to promote independent management and operation of resources, and supporting activities for enlightening and organizing residents. In practice, NGOs are involved in raising the level of local society and forming resident organizations by means of a participatory approach through various programs for human resources development, empowerment of women, literacy education and cereal banks.

Cooperation between NGOs involved in activities in Burkina Faso and the Government of Burkina Faso is legally authorized through agreements entered into by both parties. Such agreements include the Basic Establishment Agreement for international NGOs and the Authorization Agreement for domestic NGOs, both of which contain the same basic terms and conditions and include the NGOs' obligations to the Government and the Government's obligations to the NGOs as well as special provisions.

The Agreement Protocol is a legal document defining the role of the project implementer, which is signed by three parties, the NGO's representative, the Government's representative and a representative of the beneficiaries, before the project is implemented.

The NGO Service Bureau (BSONG) was founded in 1984 within the former Ministry of Economy, Finance and Planning (now the Ministry of Economy and Development) to promote communication and coordination between the Government and the NGOs. BSONG provides the following services.

① To orientate, coordinate and incorporate NGO activities in national development policies.
② To prepare and review agreements for establishing NGOs jointly with the Ministry of Foreign Affairs.
③ To support and follow-up various administrative and legal formalities for NGOs.
④ To facilitate cooperation between NGOs and governmental departments as well as other development organizations.
⑤ To guarantee material and financial management for the implementation of projects for which an NGO has secured a financial source or which the NGO itself implements.

BSONG defines an NGO as an "organization which conducts activities in a participatory-type development field" and is a "sustainable group, association or activity organization formed by individuals for non-profitable purposes". The total number of registered NGOs as of 2002 is 295, of

which 193 are international and 102 are domestic NGOs.

27 of these domestic NGOs and 30 of the international NGOs are active in the Middle-North Region or Sahel Region. In addition, some of the NGOs that are active throughout the country are active in the Middle-North Region or in the Sahel Region. Appendix 3.6 shows a list of the NGOs active in the Study Area.

Recently, NGOs have also been functioning as representatives of civil society through NGO coordinating organizations, such as the NGO Permanent Secretariat (SPONG).

SPONG is an NGO coordinating organization with a total of 77 member organizations including domestic and international NGOs. Its aims are as follows.

① To provide information on members to other members and to aid agencies
② To provide opportunities for exchange of information and discussion between members, and enhance abilities
③ To represent members' interests

SPONG publishes an information magazine (Echo du SPONG) as one of its information dissemination activities.

To provide opportunities for exchange of information, SPONG holds discussions in three groups on three topics (alleviation of land degradation, decentralization, and gender and development). Each group conducts its activities through the following steps: ① formation of groups and discussion of topics; ② recommendation and adoption of SPONG's standpoint, and ③ implementation of recommendations adopted. SPONG's position and stance have previously been determined and documented on two topics: ① alleviation of land degradation; and ② decentralization. SPONG's position on alleviation of land degradation is to conduct activities under the National Action Plan to Combat Desertification (PANLCD) and to conduct activities based on the participatory-type approach at village community level. SPONG does not expect any effects from activities at national level.

As the representative of its members, SPONG participates in conferences attended by organizations other than its members, at which it acts as the representative of civil society in activities on the theme of strengthening civil society.

As for SPONG's organizational operation, a general meeting of the representatives of member organizations is held once a year and resolutions passed at the general meeting are executed by an executive board consisting of 9 members. Everyday management of affairs is performed by a secretariat of 8 full-time staff members (director, program controller, communications manager, accountant, secretary, spokesman and two guards).

Most of its financial resources are aid funds from aid organizations and annual membership fees. The membership fees are divided into three levels: 60,000, 100,000 and 200,000 Fcfa. Support from aid organizations is appropriated for both operating and activity costs.

3.4.2 Role of NGOs in Study Area

NGOs in the Study Area have acquired a lot of know-how on participatory-type development, especially resident organizations and enlightenment, from their activities up to now.

For example, looking at the sheep-fattening program implemented in the verification project, in Diogora village a management committee was established that included not only the members of the group implementing the sheep-fattening program but also the CVGT executive board and stock-raising sub-committee, and the responsibility of each member of the management committee was defined to ensure democratic operation of the program, while in Vousnango and Noungou villages a supervisory committee was organized made up of members other than the group's members to check the flow of funds and run the program in a fair manner. NGO philosophy is to organize residents' activities based on consideration for fairness and transparency, and their know-how is the result of many years' experience in community-based activities.

Among the activities in this Study, NGOs aim to promote the opinions of CVGT representatives and act as mediators between the administration and the Study Team as well as improving residents' awareness.

NGO activities in Burkina Faso cover a wide field including the environment, hygiene, education and agriculture, as shown in Appendix 3.7. More specifically, their activities focus on organizing residents and improving their awareness by acting as facilitators for various rural activities initiated by the residents themselves, irrespective of field.

For this purpose, NGOs are making efforts to train staff with the ability to act as facilitators and animators. For example, ADRA has several volunteer members who are employed at the start of a project after being trained in the PRA method.

In another example, several young staff members of UFC-Dori participated in the participatory-type training provided in this Study and studied with the agents.

3.4.3 NGO Activities in the Study Area

The Study Team looked at the activities of two NGOs in the Middle-North Region that were in charge of surveying rural society/regional resources, in order to monitor the method of selecting villages for this Study and the actual contribution borne by residents. The results of the study are described in Appendix 3.6.

When projects are implemented, residents are required to share some of the costs, but in fact they convert their labor service into money which results in a low contribution rate of 5% or less.

There have been few cases of cooperation by two or more NGOs on jointly implementing projects, but project operation involving a combination of NGOs as implemented in this Study will be a test case for improving the abilities of the administration and NGOs.

3.4.4 Summary of Problems

① NGOs are desired to conduct activities in participatory-type development fields (including social development, such as establishment of organizations) by playing a role in complementing the activities of agents, but this involves inherent financial problems. In addition, NGOs enter into individual agreements with the National Government, but there is insufficient cooperation between the administration and NGOs at regional level.

② Projects relating to "measures to alleviate land degradation" have up to now been implemented with the support of NGOs, but there are still problems regarding independent development with respect to "sustainability" after the withdrawal of the project and "extensibility" to other regions.

③ NGOs possess extensive know-how on organizing residents and improving their awareness, but they have few experienced technicians capable of providing technical guidance in agriculture, stock raising and sylviculture. Therefore, there are many cases where it is difficult to conduct activities satisfactorily with only the support of NGOs.

Chapter 4

Chapter 4 Status and Use of Resources in Study Area

The Middle-North Region has a total area of 20,985km^2 and consists of three provinces, Bam, Namentenga and Sanmatenga. There are 28 cantons and 685 villages in the region, which has a total population of 928,321 (as of 1996) composed chiefly of the Mossi tribe. The region belongs to the Sudanian-Sahelian climatic zone and has an average annual rainfall of 600mm to 900mm. The rainy season lasts for about 5 months from the middle of May to the middle of October. Most of the region is covered with poorly-evolved erosional soils that are not very fertile, though the Mossi tribe has been engaged in sedentary farming from long ago.

The Sahel Region has a total area of 35,614km^2 and consists of four provinces, Seno, Soum, Oudalan and Yagha. There are 26 cantons and 584 villages in the region, which has a total population of 708,332 composed of about 10 ethnic groups including Peul (35%), Rimaibe (20%), Bera-Mossi (20%) and Mossi (19%). The region belongs to the Sahelian climatic zone that accounts for 25% of the country, and has an average annual rainfall of 150mm to 600mm. The rainy season lasts for 3 to 4 months (July to October) and the dry season for the rest of the year. The soil consists of degraded halomorphic soils, tropical ferruginous soils and tropical eutrophic brown soils. The flora consists of steppes dotted with bushes and thorny thickets.

4.1 Rural Society

(1) Mossi social system

1) Social units, and production and livelihood of farmers

The basic social unit of production and consumption of the Mossi tribe is called a "Yiri". The Yiri consists of paternal kinsmen and each Yiri is made up of about 25 to 100 persons. The "Yiri Soaba", meaning the "Yiri owner" or "Yiri leader", his wives, sons and their wives and children live in houses made of adobe bricks and mud walls called "Zacka". The Zacka are built around the house of the Yiri leader. The Yiri is a collection of Zacka in which the families live. In general, the position of Yiri leader is inherited by males in order of age.

Several Yiri together form a "Saka (hamlet)". One or more Saka compose a "Tenga (village)". Tenga means a living area with a regular market and a certain degree of independence. Most basic commodities can be bought in the market, which also serves as a place for exchanging information.

The land belongs to the Yiri leader (usufructuary right) and farming is carried out on his instructions. The Yiri has common fields in which the members of the Yiri grow cereals. Everyone works in the common fields from 6am to 2pm. After 2pm, the men do other work, but the women work in fields allocated to them by the Yiri leader. Most of the women grow cereals in their fields, but some also grow peanuts, niébé (legumes) and vouandzou (local legumes). These products are the property of the women.

Meals are taken in family units. Food other than cereals is produced by the wives. Water for domestic use is available from wells and women and children spend considerable time fetching water. Electricity is only available in the cities, and the villages depend on lamps. Roads within each village and between villages are poor. Transport in the rainy season is

particularly difficult and villagers sometimes cannot get to the market. Transportation is by bicycle and a growing number of farmers have carts.

2) Traditional village organization[1]

(a) Traditional village chief

Traditional village organizations were abolished during the revolution, but Tenga (village) remained as a unit even after the revolution. The traditional village chief "Teng Naaba" does not have any administrative power, but the old customs are still alive. All the Mossi village chiefs are from the Ouedraogo family. Three fourths of the traditional village chiefs are animists. The council of elders consists of 7 or 8 elders who share the duties. The villagers observe the decisions made by the council of elders and village assembly (attended by the Yiri leaders). If any villager disobeys, the elder in charge and the village chief give him a warning, but no more. Some may leave their village as a result, but the villages are not strict.

After the revolution, the power of the traditional village chiefs was restricted, but even today they have the authority to lead the villagers. It is customary for the Yiri leader to visit the traditional village chief once or twice a year, even if he goes empty-handed. If he stays away, the traditional village chief may say him, "Who are you?" In addition to the traditional village chief, there is another village chief, "Terege", with administrative responsibility who is appointed by the governor of the canton.

(b) Landowners[2]

A "landowner" is a native village elder who conducts the land fertility ceremony in traditional villages. All Mossi "Teng Soaba (village owner) landowners" are from the Sawadogo family. In the past, an agrarian tribe, the Nyonnyonse, settled in the area where the Mossi tribe lives today. The Mossi tribe moved into this area and built the Mossi Kingdom in the latter half of the 15th century. At this time, the Mossi built a complementary social hierarchy while keeping the chief of the Nyonnyonse as the "landowner ". The two tribes were assimilated through intermarriage. As there are some "landowners" who control two or more villages, they are fewer in number than the village chiefs.

The usufructuary land right of the Yiri leader is authorized by the "landowner". This right is handed down from father to eldest son. It may have a meaning that is essentially close to "ownership"[3] of land as a means of agricultural production, but "Yiri" could not sell or lease land for many years. Four festivals are held every year in the villages. Whenever a festival is held, the Yiri leader brings some or all of the cola nuts, cash, chickens, sorghum or millet to the "landowner". Some Yiri leaders bring these offerings to the landowner at

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1 The Bambara tribe in the neighboring country of Mali has a system of "ostracism". A villager who does not keep a promise is warned, and if he still fails to keep the promise, a fine is imposed. If he fails a third time, he is expelled from the village activity group ("ton").

2 The traditional Bambara village chief in the neighboring country of Mali is a descendant of the pioneers who founded the village, and he controls land distribution in the village.

3 In the agricultural land reform enforced in Japan against the backdrop of MacArthur's power, the Government paid the cost of the land, though extremely low, to each former landowner. In the land reforms of the communist government in China, no guarantee money was paid to the former landowners.

every festival, but they are only obliged to do so twice. Use of the land by the "Yiri" is always supervised by the "landowner". The farmers do not pay taxes to the government, but this custom shows that the land is essentially governed by the "landowner". The behavior of the "landowner" appears similar to the collection of tenant rent by large landowners. Today's "landowners" are very busy. As a result of the growth in population, many disputes have arisen over the boundaries of the land owned by each "Yiri". The offerings such as cola nuts that the Yiri leader brings may be a token of gratitude for dispute mediation or a type of insurance for a favorable settlement to a land dispute.

The participation of these "landowners" who essentially govern the land is considered necessary for CVGT activities. The Director General of the Extension, Research and Development Department said, "I think whoever carries out CVGT activities will have obtained the consent of the traditional village chief or the "landowner", but the participation of the "landowner " in the activities is especially desirable."

The Land Law which has 700 articles was enacted at the time of the revolutionary government from 1984 to 1987 and was partially amended thereafter, but it is not actually enforced. The authorities have discussed the law with the "landowners" representatives many times, but no agreement has been reached. This is because the rights and interests of the "landowners" which continue to this day are being denied without any guarantees.

3) Current state of marriage[4]

Mossi society is polygamous. The first marriage is often to a partner chosen by the parents. This system, in which the will of the persons concerned, especially the woman, is not considered, is not as prevalent as in the past, but it still exists. Some women are said to depend on Christianity to oppose this system. A traditional village chief said, "I don't think this is a good system. In the past many people followed this system, but now the number has declined to about half. Marriages under this system used to be publicly announced, but now the parents negotiate in secret. My eldest son is a teacher and he married for love." The position of women is improving step by step, but discrimination is still as firmly entrenched as ever.

(2) Social system of Peul tribe

A clan ("bade", equivalent to the Mossi "Yiri") is a group of families ("sudu"). Each family possesses its own land and forms a unit of production and consumption. The usufructuary right of the land is authorized by the traditional village chief. The Peul tribe has no "landowner" system. They have no common fields like the Mossi and do not act as a group of families. Cereal cultivation is the work of the men who labor in the fields from morning till evening in the harvest season. The women look after household matters, but also grow okras, etc. Inheritance is by equal division among the male members.

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[4] In villages of the Bambara tribe in the neighboring country of Mali, the first wife marries a partner of her parents' choosing. A certain village chief asked 100 women who were married under this system to evaluate their male partners. When 98 of the women answered "dislike", the village chief acknowledged that the system was a problem and said it would disappear in the near future. He supposed that this first stage of married life would be the first problem that West-African women would want to solve.

Peul are originally nomads and not very proficient at agriculture. Their sense of economy is based on stock raising, and agriculture is secondary. The farming tools that they use for agriculture are very different from those of the Mossi, though the soil conditions are also different. It seems that they cultivate fields out of necessity, not by choice. However, in response to the question "what makes an excellent farmer?", they reply, someone who ① takes good care of his fields, ② thinks only of his fields, ③ puts barnyard manure on his fields, and ④ earns a high income.

(3) Literacy conditions

When a project is planned in each village, the donors often put the CVGT in charge of the project and select young people with a high literacy rate for important posts in the CVGT, with the result that control solely by the elders as in the past is diminishing.

Table 4.1.1 Literacy Rates in Urban and Rural Areas (%)

Year	National Average			Urban Area			Rural Area		
	Men	Women	Average	Men	Women	Average	Men	Women	Average
1975	11.4	3.6	7.5	39.8	21.9	31.0	9.0	2.2	5.6
1985	19.4	6.7	12.7	53.8	32.5	43.5	14.0	3.5	8.3
1991	21.3	15.5	15.5	57.7	38.4	48.1	14.6	5.3	9.7

In Table 4.1.1, the literacy rate is very low in rural areas compared with the cities and this is an impeding factor to rural development. The low literacy rate of women in particular is a major factor impeding opportunities for their participation in various activities.

Improvement of the literacy rate is essential for residents in rural society to enjoy more affluent lives and improve production techniques.

(4) Financial conditions

The main financial resources are income from sale of products, funds provided by donors and NGOs and remittances from workers abroad. The sale of livestock and working abroad have recently become unstable due to the deterioration of public safety in the neighboring country of Côte d'Ivoire.

At present, residents sell cereals after the harvest when the price is at its lowest point in the year in order to obtain cash income for the purpose of buying consumer goods, and buy the cereals back at higher prices in the off-crop season with cash obtained from working abroad. The cereal price trends are repeated in the same cycle every year, so it is desirable to build a system that will enable residents to secure food and cash income efficiently through a cereal bank. (Refer to Appendix 4.1 Cereal Market Prices.)

Residents are very interested in cultivating vegetables in the dry season that follows the rainy season as a cash income source instead of working abroad. Donors are gradually addressing operation of cereal banks and micro credit loans by CVGTs, but the desire for access to finance is particularly high among women. Existing banks are found only in the cities and their establishment in rural areas is awaited.

(5) Women's position

The circumstances of women in rural society are very harsh. The women play an important part in production activities and livelihood management, but they have no voice in society in that they have ① no right to make decisions on important matters in their homes or villages due to traditional customs; ② no right of land inheritance; and ③ no right to dispose of assets.

According to materials issued by the former Agricultural Extension Department, women are responsible for 51.47% of agricultural production activities. In stock raising, women own between 6% and 44.7% of domestic livestock depending on type. In particular, small livestock such as sheep and goats are often raised by women, but purchase of livestock at markets is limited to men.

The family budget is controlled by men. Women cannot freely use the income earned through their agricultural and stock-raising activities, and such income is mainly used for family expenditures such as food and children's education.

In addition to their production activities, women are responsible for the household and childcare. In particular, the preparation of meals occupies the greater part of their working hours in a day because they have to grind millet with a mortar and pestle. Appendix 4.2 shows the average working hours of women aged 22 to 50 from a survey conducted by the Japan Green Resource Organization in Yakouta village, Seno Province. Their total number of working hours in a day reached 10.5 hours.

The task of drawing water also falls to women. It can take a great deal of time to draw water depending on the location of the water source. In the dry season when water is scarce, women may have spend the night near the well in order to wait for their turn to draw water early in the morning when the water level is high.

Women play an important role in rural production activities and livelihood management and possess a lot of information on local resources, but, as described above, many social and time restrictions are imposed on them. It is difficult for women to participate in activities and development for improving living standards.

4.2 Land Use

(1) Land system

The Law concerning Reorganization of Land and Agricultural Land (RAF) proclaimed in 1984 and amended in 1996 stipulates that land is national property and, as a transitional measure for rural land, that "anyone using state-owned land for agriculture, stock raising or sylviculture at the time of proclamation may continue to use it". This law was enacted in the era of the communist government. It was proposed to solve three problems, vegetation decay due to field fires, excessive grazing of animals and excessive tree felling in forests. It was aimed at local management of natural resources.

However, 20 years have passed since the law was proclaimed, but Mossi society still does not abide by it. As described in the section on the Mossi social system, the "landowner" (person

with land ownership right: Teng Soaba) governs Mossi society in addition to the village chief, and authorizes land usufructuary to the "Yiri leaders". Today, the Government is making efforts to set up terroir management organizations in the villages, through which the villagers themselves can establish a natural resources management system for their village. However, the traditional system of Mossi society has not been completely abolished. An official in the Government of Burkina Faso has said that land system reforms must be promoted gradually.

In the Fulbe groups (Peul and Rimaibe blacksmiths etc.) in the Sahel Region, there is no "landowner" as in Mossi society. The villagers cultivated their fields with the permission of the Djorro (traditional Peul village chief) until 1984. Today, however, land use is decided through mutual discussions in the CVGT.

(2) Land use

The characteristics of land use in the Middle-North Region and Sahel Region are outlined below.

1) Middle-North Region

The Middle-North Region can be divided into three types of vegetation: steppes with bushes in the north, bushes in the center and forests with bushes and large trees in the south.

The Middle-North Region is inhabited mainly by the Mossi tribe. The land is predominantly used for cultivation of millet and sorghum. However, the cultivated crops are different in the north from those in the center/south. Soil degradation is advanced in the steppes with bushes in the north and the land is mainly used for grazing. In the center, millet is the main crop and cotton is also cultivated in parts around Kongoussi in Bam Province. In the south, sorghum and millet are the main crops and peanut cultivation is also popular around Begande in Namentenga Province. In the past, fields lay fallow for 5 or 6 years, but the fallow periods have been getting shorter in recent years. In Bam Province in the north, GTZ is implementing a soil conservation project over 50,000 or 60,000 hectares mainly by building stone ridges. In this area, the land system of Mossi society is still firmly entrenched and the villagers cultivate the fields with the permission of the "landowner". Around Kongoussi and Kaya, the cultivated area is small, but vegetable cultivation is flourishing using water from bas-fonds and wells.

In the Middle-North Region, there are 4 government-designated forest reserves in the vicinity of the river. The total area of the forest reserves is 37,666 hectares. Residents and the Environment Department cooperate in conserving forests with high potential. There are management groups to manage forests with high potential and they have been expanded into a forest management union. In the Middle-North Region, there are 30,000 hectares of forests with high potential.

2) Sahel Region

Vegetation in the Sahel Region consists of a savanna and steppe zone with small bushes, a zone scattered with trees and a forest zone. The area of the forest zone is 2.6 million hectares which, together with the 510,000 hectares of fallow land where there are forests and bushes, accounts for 84% of this region. In the forest area, "the partial protected zone for forests, stock raising and wild animals in the Sahel Region" extends across Soum Province and Oudalan Province. Although there is a slight difference between north and south, the

entire land of the Sahel Region is used for transhumance.

Land use in the Sahel Region is characterized by the change from transhumance-based livestock production and extremely local farming to agro-sylvo-pastoral land use. This region can therefore be divided into the following 3 agro-sylvo-pastoral zones:

(a) Open pastoral zone

This zone is located north of the 400mm average annual rainfall line and cereal production is unstable in this zone. The zone is characterized by a preference for stock raising, with a high livestock density of 25UBT (tropical livestock unit)/km^2 against a low population density of 13 persons/km^2. There is almost no private land use, but livestock move around freely in the search for fodder and water.

(b) Saturated agro-pastoral zone

This zone has an average annual rainfall of 400mm to 500mm and is substantially covered with sandy and sandy/silty soils. It has a high population density of 25 persons/km^2 and a high cattle density of 50 UBT/km^2. 50% of the cultivable land is cultivated every year and farming pressure is high. There is a marked tendency to expand the field area and use the land as private property. Selbo village, one of the villages in the verification project, belongs to this zone.

(c) Unstable agro-pastoral zone

This zone is located south of the 550mm average annual rainfall line and has a population density of 20 persons/km^2. The residents are settled and the land users have been decided. Conflicts between farmers and nomads arise often in connection with land use. Digora village, one of the villages in the verification project, belongs to this zone.

(3) Establishment of Natural Resources Management Regulations

The Joint Ministerial Ordinance concerning CVGT Structure, Authority, Organization and Operation (Ministry of Agriculture, Ministry of Environment and Water, Ministry of Economy and Finance, Ministry of National Land Conservation and Ministry of Animal Resources) was announced in February 2000. It stipulates the CVGT's responsibilities for ① orientation and coordination of terroir-scale development action with the cooperation and support of the Government and development partners; ② granting, assessment and withdrawal of state-owned lands in the village; ③ formulation of plans for the purpose of terroir management and development; and ④ general management of the village infrastructure, village-owned forests, grasslands, fauna and natural resources. In short, the use of village lands and natural resources must be managed in an orderly manner by the residents themselves.

It is also stipulated that the management of roads, rivers and joint-use lands in the villages may be conducted under an inter-terroir agreement on natural resources. It is impossible for a single village to solve the problem of soil degradation; it is necessary for all the villages in the river basin to take joint measures. In such cases, the villages concerned conclude an agreement on joint management of natural resources. In Bam Province in the Middle-North Region, there are cases where a soil conservation program has been implemented with the support of GTZ and an inter-terroir agreement on natural resources has been concluded.

When deciding natural resources management in Mossi society, formulation of such agreements must include the "landowner".

4.3 Agriculture

4.3.1 Agricultural Production Overview

The main industry in Burkina Faso is agriculture. The main cultivated cereal is sorghum, followed in order by millet, maize, rice and fonio, which together account for 85% of the total agricultural area.

The cereal yields depend on the amount and number of days of rain. If the rainfall conditions are favorable, yearly production can reach 2.5 million tons, which meets the requirement of 190 kg per person.

For example, cereal production in 1999/2000 was 2,699,900 tons, an increase of 2% over the previous year and an increase of 13% over the average for the past 5 years, and enough to satisfy the domestic requirement for self-sufficiency in food. However, cereal production the following year amounted to approximately 2,286,200 tons (a decrease of 15% over the previous year and 6% over the average for the past 5 years). A cereal shortage was therefore observed in 19 of the 45 provinces, reaching critical proportions in 3 provinces. In these 19 provinces, the total shortfall was 20% of the required amount (a shortfall of 80,000 tons).

The average cereal yield for the past 27 years showed an increase of 1.1%, but self-sufficiency in food could not be achieved due to socioeconomic restraints (including the annual population growth rate of 3%).

The average cereal yield in 1999 was 720 kg/ha of sorghum, 500kg/ha of millet, 1,160 kg/ha of maize (1,600 kg/ha with manure left over from cotton cultivation) and 2,050 kg/ha of rice (by irrigated rice farming).

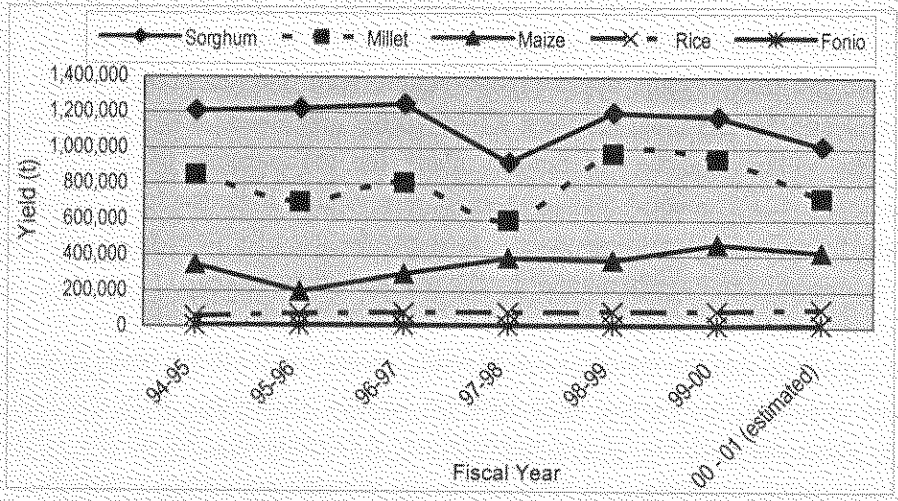

Figure 4.3.1 Shifts in Cereal Production

Niébé, Bambara nuts, yam, potato, cotton, peanuts (average yield of 690 kg/ha), sesame and soybeans are cultivated as cash crops. In recent years, cotton production (1,080 kg/ha) has shown a sharp

increase. With the manure left over from cotton cultivation, production of cereals, especially maize and sorghum, could be increased, so the cotton cultivation zone became a food security zone. As for vegetables, the cultivation of cabbages, onions, tomatoes, lettuces, eggplants, carrots and okras has increased.

(1) **Middle-North Region**

The average yields of the main farm products for the past 5 years are, in order of volume planted, sorghum 859 kg/ha, millet 680 kg/ha, maize 1,041 kg/ha, rice 925 kg/ha, and fonio, which is cultivated only in Bam Province, 1,119 kg/ha. These figures are about 90% of the national average, and the yields can supply 95% of the cereal demand in years with good rainfall, but only 70% of demand in Sanmatenga Province which has a high population. In addition, niébé, Bambara nuts, peanuts and sesame are cultivated widely, and the production of cotton and soybeans reaches high amounts in Bam Province.

The rainfall is unbalanced in terms of time and space, and is decreasing year by year, resulting in unstable agricultural production. Extensive cultivation and excessive grazing have aggravated soil and vegetation deterioration. As a result, productivity not only in agriculture but also in stock raising and sylviculture has declined.

(2) **Sahel Region**

The average yields of the main farm products for the past 5 years are millet 451 kg/ha, sorghum 524 kg/ha, and maize 406 kg/ha. In Soum Province, the average yields are rice 162 kg/ha and fonio 560 kg/ha. Even when the crop situation is good in other regions, yearly production cannot meet demand in this region, only achieving around 70% even in good years. For example, total production in 1999-2000 amounted to 120,954 tons in relation to demand of 143,525 tons and a population of 755,397. Food production accounted for 102,522 tons of total production, resulting in a shortfall of 41,003 tons. Niébé, Bambara nuts, peanuts and sesame can be cultivated as cash crops, but they are not produced in high quantities due to lack of rainfall.

This region is a so-called agro-sylvo-pastoral zone with markedly inferior soil and vegetation status attributable to a combination of extensive cultivation, excessive grazing and low rainfall, resulting in low agricultural production and threatening the livelihoods of the residents.

However, the cause of such intensive deterioration of natural resources has not been closely analyzed yet. As the complex phenomena causing land degradation have not been clarified, the many attempts to control it have failed.

4.3.2 Agricultural Development Policies in Both Regions

Agricultural development policies that take into consideration the natural and social environments have been formulated at regional level based on national policy. Table 4.3.1 shows the agricultural development policies in the Study Area.

Table 4.3.1 Agricultural Development Policies in Study Area

Region	Agricultural Development Policies
Middle-North Region	To implement programs for soil fertility recovery, diversification of cash revenues, food security and alleviation of poverty in rural areas. Items of special consideration: - Soil fertility (use of natural phosphate ore) - Measures to halt erosion - Investment in equipment - Development of small-scale irrigation facilities (small-scale private irrigation facilities) - Reuse of sesame and peanuts for oil production
Sahel Region	To support stock raising and food security. To support agriculture by use of organic matter, and to improve productivity by appropriate techniques for water resource and soil conservation and stabilization of sand dunes.

The Government and aid organizations are implementing projects and programs aimed at comprehensive development of agricultural and livestock production. These policies are enforced in accordance with DOS and PSO, and the administration (especially agents) is engaged in these projects by providing technical support.

4.3.3 Extension of Agricultural Technology

(1) Farmers' sense of weights, measures and area

Residents of West Africa have little sense (awareness) of territory, and farmers also have little sense of weights, measures and area. This is a major obstacle to the diffusion of agricultural technology.

Of weights and measures (length, volume, mass) and area, ordinary farmers engaged in cereal production only have a sense of volume as a traditional unit. The unit for volume varies from region to region. An iron dish called a "Yorba" is used by merchants and farmers in the Middle-North Region and a plastic cup called a "Horde" in the Sahel Region.

Cereal-producing farmers own extensive areas of farmland. Cultivation depends on the manpower that can be mobilized. The farmers do not usually use chemical fertilizers or agricultural chemicals at the production stage. Therefore, they do not need to know volume per unit area (ha) or the amount of fertilizer to use. The volume of harvested cereals is perceived by the state of the reaped ears stored in the warehouse, but is not measured in units of volume or weight, which are not needed. When selling cereals, the traditional "Yorba" (iron dish) or "Horde" (plastic cup) is simply used. The fact that farmers have a poor sense of weights, measures and area means that there is no civilization with which to receive production technology using weights, measures and area.

Cultivation of niébé (legumes) is a good source of cash income, but it is prone to disease and insect pests. When a farmer inquires at the agent's office about a way of getting rid of insect pests, the agent asks him what the area of the field is. The farmer replies that it is an area

surrounded by this tree and that tree. The agent gives instructions regarding the amount of chemicals to be purchased for such an area. He demonstrates the insect extermination method using a sprayer with water in it to show the degree of spraying. The farmer borrows the sprayer from the office.

Farmers who produce cash crops (cotton, vegetables and sesame) have a sense of weights, measures and area because they sell their products and use fertilizers and agricultural chemicals at the production stage.

(2) Actual farming conditions

The production technology manuals used by agricultural agents contain instructions on seeding quantity per unit area (ha), seeding intervals, amount of fertilizer, amount of agricultural chemicals and operation method. However, even if the farmers are taught seeding quantity per unit area etc., they cannot use it. When extending techniques to farmers, the agents estimate the area of the actual site by eye and teach the farmers the instructions in the manual in a way that the farmers can recognize using their working sense. When this working sense is imitated by someone, it gradually loses its accuracy as it is passed on. Thus, production techniques without a sense of weights, measures and area are not good for reliably extending to farmers.

(3) Introduction of latest effective techniques and new varieties

Agricultural agents are expected to provide farmers with technical guidance in techniques and new varieties, the effectiveness of which has been verified at agricultural experiment centers. However, there are not many instances, especially in the Sahel Region, of techniques and varieties being introduced and extended in rural society. The cause of this problem has been attributed to the closed society and the extension methods, but the main cause is inadaptability to farmers' needs in the field.

INERA introduced an early season variety of rice which was expected to bring in high yields in the short rainy season in the Sahel Region, but the attempt was unsuccessful because the farmers preferred the existing late variety that produced ears even under unstable rainfall, even though yields were low. Many such cases of mismatches between new techniques and on-the-spot needs are seen when introducing farming tools, compost and effective mixed cropping.

4.4 Stock Raising

4.4.1 Head of Livestock Raised

In the Sahel Region, there are a number of breeding goats, which account for 21% of the total number in the whole country. An increase in goat milk production is therefore expected in the action plan of the Ministry of Animal Resources. The percentages for cattle and sheep are 12% and that of pigs is low. Poultry accounts for 5%. The number of goats per person is three times the national average, and that of cattle and sheep is 1.7 to 1.8 times. We can conclude from these figures that this region is a leading stock-raising zone. Camels are found only in the Sahel Region.

In the Middle-North Region, the number of livestock is lower than in the Sahel Region. Goats account for 12% of the total number in the whole country, sheep for 13% and cattle 8%. The number of goats

and sheep per person is 1.4 times the national average, and that of cattle is 0.9 times. Poultry accounts for 8% of the national total, higher than in the Sahel Region, as this production area is near to the consumption area.

Table 4.4.1 Head of Livestock in Breeding by Province

(Unit : head)

Region	Province	Cattle	Sheep	Goats	Pigs	Donkeys	Horses	Camels	Fowl
Middle-North Region	BAM	62,1.12	190,962	263,209	6,138	12,277	590	0	366,647
	SANMATENGA	139,206	427,5.43	503,609	14,045	24,762	590	0	963,722
	NAMENTENGA	169,065	249,205	308,191	5,098	1.1,236	35.3	0	570,234
	Total	370,383	867,710	1,075,009	25,281	48,275	1,5.33	0	1,900,603
Sahel Region	SOUM	171,562	244,962	5.33,421	663	15,190	825	3,867	380,120
	OUDALAN	70,851	152,239	294,612	0	23,513	35.3	8,670	128,793
	SENO*	356,857	387,5.47	989,608	441	16,230	943	2,226	665,184
	Total	599,270	784,748	1,817,641	1.104	5.4,933	2,121	14,763	1.174,097
Others		3,828,568	5,129,982	5,75.4,640	596,108	397,869	22,643	0	19,345,618
Grand Total		4,798,221	6,782,440	8,647,290	622,493	501,077	26,297	14,763	22,420,318

Note: The number in Seno Province includes the number in Yagha Province based on the administrative boundary system before 1995

Source: Livestock Statistics Service

Most cattle breeds are native breeds such as Peul, though there are also some Asawac and Sokoto (Gudari) breeds which were introduced through projects for improvement of milk production. Small and medium-size livestock are also dominated by native breeds and improvement has not progressed.

Grazing is the way of feeding cattle, goats and sheep. In the rainy season, this is limited grazing with someone on watch to prevent the livestock from damaging the farm products, and in the dry season unlimited grazing in the millet and sorghum fields after the crops have been harvested. This results in the ground being flattened under the pressure of the animals' hooves, reducing the porosity of the soil, with adverse consequences for the next crop, and aggravating surface runoff.

The excessive grazing caused by the imbalance between fodder production and the number of livestock constitutes a major factor in land degradation. If the shoots of useful plants are continuously eaten away by livestock through excessive grazing, the regenerative ability of the plants declines, resulting in less land covered with plants and more soil erosion.

This problem is broadly recognized at agent level, and it is an important issue in solving excessive grazing. To stop excessive grazing, however, it is necessary to reform the consciousness of the residents who think of livestock as an asset, and it involves problems that cannot be solved simply through administrative guidance. The Ministry of Animal Resources and the Institute of Environment and Agricultural Research (INERA) aim to stop excessive grazing by recommending fattening by keeping livestock in sheds. This indirect method of fattening promotes artificial and natural selection (disposal by sale) of livestock, resulting in a reduction in excessive grazing. The production and utilization of compost using cattle dung and fodder residues available from raising livestock in sheds are promoted to prevent soil deterioration.

Furthermore, as a result of the regional resources survey conducted in the first field study, residents recognize that the shortage of drinking water for residents and livestock is another problem to be solved. It is also necessary to solve the water shortage in order to establish grazing areas.

In the action plan of the Ministry of Animal Resources, the breeding zone (zone that supplies feeder animals for fattening) in the Sahel Region and the central plateau area including the Middle-North Region are designated as fattening zones, and as part of the environmental activities, it is planned to implement natural grassland conservation and haymaking, improvements in feeding through the use of multi-purpose crops such as niébé, and construction of water supply facilities such as cattle wells. From the viewpoint of grassland development and securing of land, it is planned to establish a law concerning grassland allocation and land designation. These activities are important to secure fodder and regulate unlimited grazing, and also to prevent land degradation.

As for grassland improvement techniques, there was one successful case in which the Danish International Development Agency (DANIDA) adopted sous-solage (deep plowing every few meters) using a plow drawn by a tractor in order to promote vegetation recovery in depleted grazing lands. UFC-Dori, an NGO, is tackling bare land recovery using this method.

4.4.2 Cattle Diseases

There are many cases of infectious diseases in the Study Area, and the incidence of cattle emphysema and pasteurelloisis in cattle, goats and sheep is very high, accounting for 30% to 50% of cases nationwide. These diseases affect the health of livestock and suppress productivity. The mortality of cattle after symptoms appear is 11% in the case of emphysema and 5% in the case of pasteurelloisis. The mortality of goats and sheep in the case of pasteurelloisis is 10%, so losses due to these diseases are high. Losses due to internal and external parasites are also high. Measures to deal with livestock diseases are an important issue for the future. However, another cause of excessive grazing is growth in the number of cattle as a result of recent vaccination campaigns. Therefore, it is necessary to provide guidance on vaccinations with a view to preventing a drop in productivity, while implementing indirect selection combined with fattening techniques.

Table 4.4.2 Infectious Cattle Diseases

Region	Province	Emphysema	Foot and mouth disease	Pasteurelloisis	Anthrax	Lumpy skin disease	Contagious pleuropneumonia
Middle-North Region	BAM	0	1	0	0	4	0
	SANMATENGA	0	0	1	0	0	0
	NAMENTENGA	2	1	0	1	0	0
	Total	2	2	1	1	4	0
Sahel Region	SOUM	11	0	14	0	0	0
	OUDALAN	24	0	13	0	0	0
	SENO	11	2	4	0	5	0
	YAGHA	0	5	0	0	0	0
	Total	46	7	31	0	5	0
Others		56	70	30	22	16	20
Grand Total		104	79	62	23	25	20

Source: Directions Provinciales des Ressources Animales

Table 4.4.3 Infectious Diseases of Goats and Sheep

Region	Province	Pasteurelloisis	Anthrax	Skin diseases	Infectious/ pustular dermatitis	Goat-pox	Scabies
Middle-North Region	BAM	1	0	1	0	0	0
	SANMATENGA	-	-	-	-	-	-
	NAMENTENGA	-	-	-	-	-	-
	Total	1	0	1	0	0	0
Sahel Region	SOUM	9	0	0	0	3	0
	OUDALAN	4	0	0	0	0	0
	SENO	8	0	0	0	0	0
	YAGHA	0	0	0	1	0	0
	Total	21	0	0	1	3	0
Others		33	5	0	1	2	2
Grand Total		55	5	1	2	5	2

Source: Directions Provinciales des Ressources Animales

4.4.3 Livestock Markets

There are 14 livestock markets in the entire country according to a survey by the Statistics Department, of which 4 are located in Gorom-Gorom in Oudalan Province, Djibo in Soum Province, Yilou in Bam Province and Kaya in Sanmatenga Province in the Study Area. The number of livestock on each market is steadily growing, but the number of goats in Yilou market has noticeably increased in recent years.

The monthly market prices show fluctuations due to seasons and holidays.

Table 4.4.4 Shifts in Number of Livestock on Livestock Markets

Livestock Market	Market Day	Livestock	1996	1997	1998	1999	2000
Kaya	Every 3 days	Cattle	33,204	32,606	33,126	33,087	44,027
		Sheep	21,679	20,423	21,047	20,865	23,210
		Goats	12,1.11	12,675	13,423	1.1,614	13,346
Yilou	Every 3 days	Cattle	0	0	0	0	0
		Sheep	36,794	32,732	34,158	40,440	56,469
		Goats	44,912	45,834	47,025	68,739	106,332
Djibo	Once a week	Cattle	51,066	51,450	5.4,1.11	27,925	40,882
		Sheep	64,892	68,760	72,121	74,687	69,446
		Goats	65,750	73,232	79,104	79,182	76,276
Gorom-Gorom	Once a week	Cattle	20,703	18,679	20,256	19,75.4	19,983
		Sheep	19,5.44	17,404	19,003	15,218	16,375
		Goats	16,572	15,088	17,417	14,620	15,818

Source: Enquete marche de betail/ Service des Statistiqes Animales

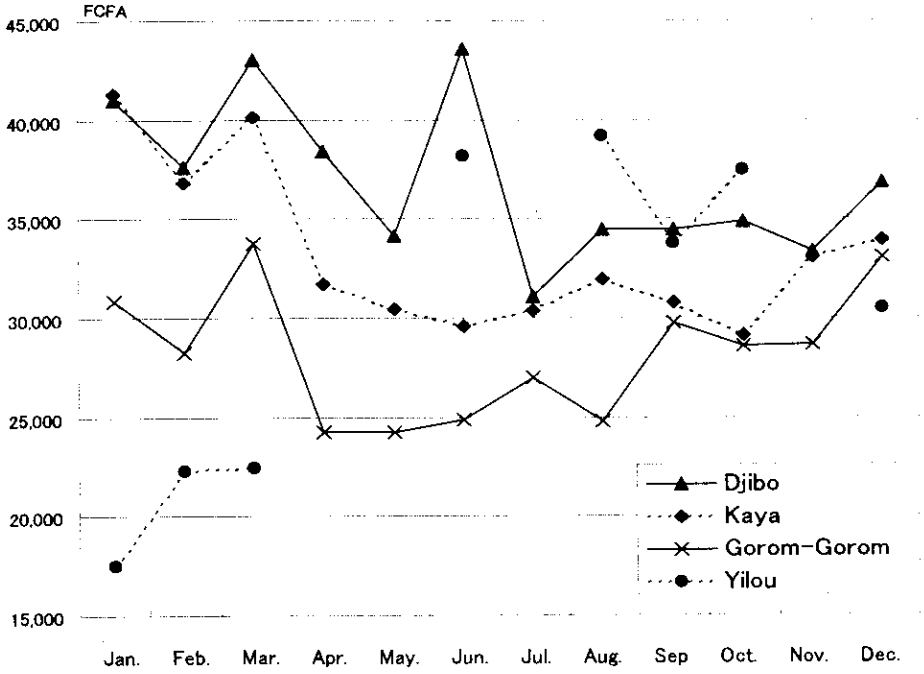

Figure 4.4.1 Monthly Trends in Market Prices of "Taureau" (bulls over 3 years old) and "Boeuf" (bullocks over 3 years old) in Good Fattening Conditions

4.5 Forest Resources

4.5.1 Status of Vegetation and Forest Resources

In classifying the Study Area by botanic and geographic zones, the Sahel Region belongs to the Sahelian zone and the Middle-North Region to the Sudanian zone. The features of the vegetation in each region are described briefly below.

(1) Middle-North Region

The Middle-North Region is classified as being in the Sudanian vegetation zone. Bush savannas are distributed in the north and low- and high-tree savannas in the south. The north is a transient zone lying between the Sahelian zone and the Sudanian zone, in which acacia trees and low trees and bushes with thorns are seen, as in the Sahelian Zone. The transition from the Sudanian zone to the Sahelian zone is apparent in the appearance of Butyrospermum parkii (sea butter tree, karite in French), Parkia biglobosa (African locust, néré in French) and Khaya senegalensis (African mahogany). Trees showing the features of the Sudanian zone increase the further south you go and there is more vegetation coverage. On the hard soil plateaus, Combretum micranthum of the Compretaceae family appears, and Mitragyna inermis, Nauclea latifolia and Acacia campylacantha can be seen in terrain that is periodically flooded.

The greater part of the Middle-North Region is included in the North-Sudanian zone, where the population density is high, as described previously, and intensive farming is conducted, which may tip the balance against weak vegetation. Once vegetation is lost due to excessive land development, it is very difficult to recover. Potential wood resources in the Sudanian zone are estimated to be about 7.5 to 31 m^3/ha per year and with appropriate management, soil devastation

can be improved.

In the Middle-North Region, there are 4 forest reserves (Tougouri, Yabo, Goada and Tanbili) and 2 hunting zones (Noungou and Soromzougou). Tilapias and other fish are used as aquatic resources in 16 water sources such as ponds,. According to data issued by the Environment Department, the total fish catch in 2000 in three cantons amounted to 87,792kg, and these resources have an important effect on the economy of the region.

(2) Sahel Region

The features of this region, which is classified as being in the Sahelian zone, are the predominance of low trees and bushes with thorns, and tree varieties that include Acacia senegal (gomié in French), Acacia nilotica and Balanites aegyptiaca (baranos). By topography, Panicum laetum is often seen on low ground and Anogeissus leiorocarpus, Acacia seyal and Mitragyna inermis are seen along rivers and bas-fonds.

The impact of soil deterioration with regard to forestry is that it leads to deterioration of biological diversity (decline in the composition of flora and fauna and in genetic diversity), deterioration in the living environment (difficulty of procuring firewood, and environmental pollution) and a decline in the economic effects of natural forest groups (such as food supplements, medicines, culture and wood). In the north of the Sahel Region, soil deterioration has killed a number of tree varieties and the dead trees[5] have resulted in a growing expanse of bare land. Plants are concentrated on low, undulating ground and perennial plants have decreased while annual plants have increased. Broadleaf trees with high evapotranspiration have decreased and narrow-leaf thorny tree varieties have increased.

The greater part of Oudalan, Soum and Seno Provinces in the Sahel Region is designated[6] as a protected area for the protection of natural resources.

Table 4.5.1 shows the area of vegetation by province in the Study Area as of 1984. The area of vegetation in the Sahel Region and Middle-North Region is reported to be 2.14 million hectares and 600,000 hectares respectively. The vegetation area in the Sahel Region which has a drier climate is larger than the Middle-North Region. This is because the data includes uncultivated land as well as bush woods and grasslands in the Sahel Region. On the other hand, it demonstrates that cultivated lands are increasing in the Middle-North Region.

[5] Especially Pterocarpus lucens.
[6] From IUCN (International Union for the Conservation of Nature)

Table 4.5.1 Vegetation in Study Area (1984)

Region	Province	Area (km^2)	Area of savanna trees (ha)	Area of bush woods (ha)	Total area of vegetation (ha)	Vegetation rate (%)
Middle-North	Bam	3,991	3,606	86,556	90,162	22.6
	Namentenga	7,449	12,366	167,787	180,153	24.2
	Sanmatenga	9,279	119,414	206,087	325,501	35.1
Total		**20,719**	**135,386**	**460,430**	**595,816**	**28,8**
Sahel	Oudalan	10,007	0	688,004	688,004	68.8
	Seno[7]	13,385	0	780,522	780,522	58.3
	Soum	13,062	0	673,434	673,434	51.6
Total		**36,454**	**0**	**2,141,960**	**2,141,960**	**58,8**

Source: Study Report by Fonte J., Guinko S. et al.

4.5.2 Reforestation Activities

In general, it is difficult to develop forestry for wood production as an industry in the Sahel Region. Even if seedling production is increased through establishment of nurseries as operation bases, there will be problems, such as the maintenance and operation of the nurseries and their distant location from the planting areas, resulting in poor reforestation activities.

(1) **Middle-North Region**

In reforestation activities in 2000, a total of 539,494 seedlings were produced in 207 nurseries[8], of which 398,171 were used for reforestation of a land area of 585.96ha or approx. $7km^2$. Approximately 74% of the seedlings were produced in projects such as PATECORE, PS/CES-AGF and Green Belt. The main tree varieties include Azadirachta indica (neem), Acacia senegal and Eucalyptus camaldulensis (eucalyptus). The tax revenue from permits for firewood sale, etc. amounted to 33,194,525 Fcfa in 2000.

With the support of the NGO "L'eau vive" in 1995, a joint program for planting Azadiracta indica (neem) was implemented in Vousnango village. Reforestation to prevent erosion was also carried out by a resident group in Noungou village with the support of Comité Nongtaaba.

At present, there are 6 ongoing projects in the Middle-North Region that are being conducted with the cooperation of the Regional Department of the Environment and Living Environment . These are PNGT II, PDL/S, PATECORE[9], CES-AGF, Green Belt and nursery construction. Other small-scale activities are being conducted with the support of NGOs and associations in 24 locations.

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7 Data as of 1984 when Seno Province in the Sahel Region had not been divided into Seno and Yagha Provinces.

8 The type of nursery has not been ascertained, but average production was relatively low at 2,606 seedlings. Most are produced in private nurseries. Privately run nurseries are more efficient at sustainable seedling production than large-scale nurseries.

9 This project for bare land recovery by GTZ is under implementation in Kongoussi.

Table 4.5.2 Reforestation in Middle-North Region (2000)

Province	Nurseries		Traditional Reforestation		Agro-forestry Reforestation	Other Reforestation	Total Quantity
	No.	Production	Q'ty	Area (ha)			
Bam	110	244,794	91,887		44,739	10,457	147,083
Sanmatenga	41	137,981	102,350		29,830	8,889	141,069
Namentenga	56	156,719	91,562		13,986	4,471	110,018
Total	207	539,494	285,799	526.89	88,555	23,817	398,170

Source: DREF Centre-Nord 2000 Annual Report

(2) Sahel Region

In reforestation activities in 2000, 273,185 seedlings were produced in 158 nurseries, of which 84.3% were planted. It was confirmed in the study after plantation that 47.8% of the planted seedlings were growing. The main reasons for the low rate of growth were low rainfall, lack of maintenance and operation after planting, and lack of protective fences.

The revenue from the issue of sales permits amounted to 21,951,275 Fcfa (2000), of which about 80% came from forest resources. The revenue from fisheries was 1,044,000 Fcfa, and from hunting 1,772,600 Fcfa, and miscellaneous revenue was 2,225,000 Fcfa. These revenues were put in the national treasury.

Table 4.5.3 Reforestation in Sahel Region (2000)

	Nurseries		Traditional Reforestation		Agro-forestry Reforestation	Other Reforestation	Total Quantity
	No.	Production	Quantity	Area (ha)			
Total	158	273,185	95,807	336.87	115,322	19,185	230,314

Source: DREF Sahel 2000 Annual Report

The activities of the Middle-North and Sahel Regional Environment and Living Environment Departments in 2000 are summarized in Appendix 4.3. Many of these activities, including enlightenment and technical training in environmental protection and reforestation, have been implemented in projects or with the support of PS/CES-AGF, PATECORE[10] and the Canadian fund (Fond Canadien) in the Middle-North Region and DANIDA and GTZ in the Sahel Region.

Survival rates after planting are less than 50% in both the Middle-North and Sahel Regions according to monitoring surveys, and the evaluation of resident participants and the projects investing in the reforestation activities is that "the number of trees that are growing is low compared with the labor and cost invested in the planting". Therefore, it is necessary to trace residents' participation in the reforestation programs from the planning to the implementation stages and the situation concerning planting techniques.

Fees are collected for licenses to sell firewood, hunting licenses and fishing rights, and the Forest Law stipulates that a fund shall be established and part of the revenue appropriated to the fund, but there is no sign of a fund being established at present.

[10] Project implemented by GTZ in Kongoussi Canton for bare land recovery.

4.6 Water Resources

4.6.1 Topography and Geology

Geologically, the greater part of the surface stratum of the Study Area consists of granite and metamorphic rocks. Large-scale sand dunes are also distributed in the north of the Sahel Region.

The terrain is flat and a laterite stratum formed by weathering has developed to cover the surface stratum. According to the geological map prepared by Burkina Faso Bureau of Mines and Geology (Bureau des Mines et de la Geologie du Burkina Faso – BMG), a number of faults extend in a northeast to southwest direction.

Surface water gathers in bas-fonds, meaning the low ground at the bottom of a valley (Fig. 4.6.1). The bas-fond indicates the extent of water inflow during the rainy season and is called a "seasonal river" because the water dries up in the dry season. The slopes around a bas-fond are very gentle, 0.5 to 2.5m/km parallel to the flow path and 20m/km or less across the flow path, but a pond forms in the rainy season.

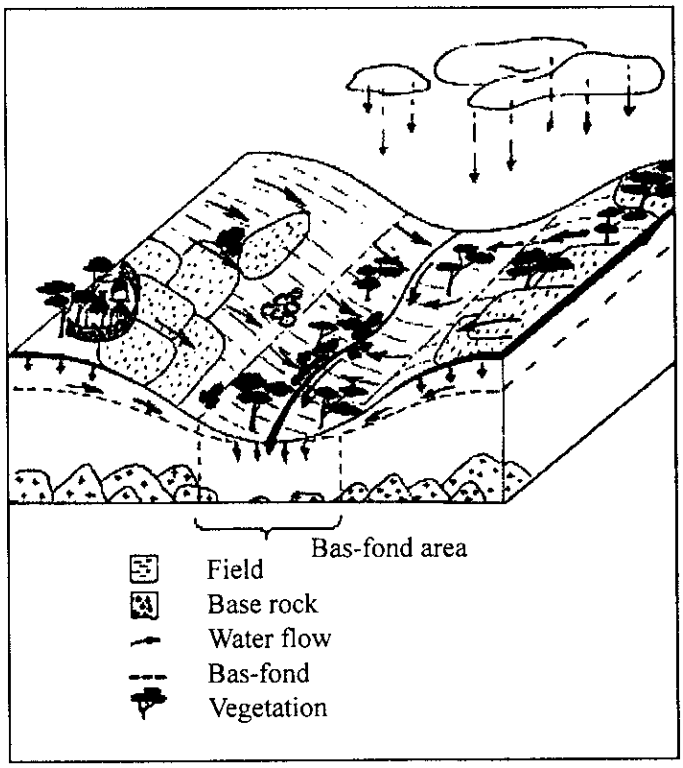

Figure 4.6.1 Concept of Bas Fond

4.6.2 Groundwater

As the Study Area is located in the inland of the continent where it is not affected by orogenic movements and sea-level rhythms, it has not developed the "alluvium" of a potential aquifer. Therefore, most of the groundwater stays in the weathered bedrock surface layer and in tiny fractures in the bedrock.

The most notable geological features in the Study Area are dune deposits, river deposits and fault fracture zones. With their excellent permeability and retention ability, they are all potential aquifers. The former two, with their excellent retention ability, provide relatively stable groundwater levels and the groundwater surface is in a shallow location below the ground surface. Their distribution is limited to the sand dune zone and its periphery in the Sahel Region.

It is possible that the groundwater levels are distributed in a smoother form than the present topographic features. In the low elevation areas, the groundwater level is close to the ground surface while the groundwater level lies in a relatively deep point in the high elevation areas.

The water levels in bas-fonds are to be connected with the groundwater level in the base rock, and during the rainy season in which the groundwater level rises, the groundwater level is higher than the ground surface, resulting in being surface water. During the dry season, the water level falls and the surface water runs dry, becoming an undercurrent.

4.6.3 Relation Between the Terrains and Hamlet Locations

Many cities and hamlets are not located in the vicinity of bas-fonds. There are many cases in which cities and villages are located in areas with limited availability in water. The locations of cities and hamlets may have been selected with preference to flood prevention in the rainy season.

4.6.4 Current Status of Water Use

Except in the vicinity of large-scale bas-fond, groundwater is only available in a natural state in the rainy season (June to September). Ponds called "buri" have been dug in places, but most dry up in the latter half of the dry season. Therefore, residents have to rely on groundwater for a stable water supply throughout the year.

The Water Resources Inventory Department of the Ministry of Agriculture, Hydraulics and Halieutic Resources has created a database containing a list of all the wells in the country, including small-diameter boreholes 30m to 8m deep. More than 4,000 wells are listed in the Middle-North Region and the Sahel Region. This represents about 3 to 5 wells per village, but most villages have at least one large-diameter well.

It is estimated that approximately 8,000 wells exist in the Middle-North Region and the Sahel Region, including both small-diameter boreholes and large-diameter wells. In relation to the population, this means one well per 200 to 300 persons.

However, according to the database of the Water Resources Inventory Department, 30% of all the wells are out of order and not functioning. In actual fact, 50% of the existing wells can be considered unusable. In addition, many large-diameter wells appear to run dry in the latter half of the dry season. In light of the above, it is estimated that one well is used by about 500 persons.

The boreholes are commonly equipped with a manually driven pump, which frequently breaks down. The residents know about management and have created a fund for repairing the pumps. Whenever a pump breaks down, they pay a high charge of around 500,000 Fcfa to have it repaired. In many cases,

the repairers do not carry out thorough repairs, so it soon breaks down again. This happens over and over again.

In the past, NGOs had a "water facilities maintenance" section, but many such sections have split off to become private maintenance companies.

The repair companies employ a system whereby they make a regular tour of maintenance to the villages and repair the pumps as requested by the villagers. However, in recent years the excessively frequent breakdowns have led the villagers to distrust the companies.

For this reason, large-diameter wells have been reevaluated for ease of maintenance. Residents want a water source within 2 or 3 km of their homes.

The limited water sources are used first of all for domestic use (mainly for drinking water) and for livestock. Agricultural water relies mainly on rainwater. Crops are cultivated in the bas-fond immediately after the rainy season.

Good quality water from wells is used for domestic water. Women, mainly, form a queue in the morning and in the evening to draw water and carry it in buckets or containers to their houses. The livestock gather around the bas-fond.

4.6.5 Actual Conditions of the Water Quality

The edges of many bas-fonds are used as drinking places of livestock, which may be contaminated with excreta. It is a serious sanitary problem because the water of bas-fonds is also used as living water. A full attention should be paid to the underground permeation of the water containing a high quantity of nitrogen oxide through excrements and living wastewater, livestock excreta and manuring in agricultural lands. In some wells, coliform bacilli and general bacilli have been detected.

4.6.6 Water Source Development Methods

(1) Surface water

New surface water development for the purpose of securing domestic water is not very advantageous due to the fact that evapotranspiration (about 1,800 to 3,000mm) is far higher than the yearly rainfall and there is no drastic way of preserving the water quality because livestock can approach easily.

If use is limited to agriculture, surface water development is an effective solution. One method involves drilling near a bas-fond, constructing a bank on the downstream side by piling up the surplus soil, and digging a hollow into which water is induced. Another method involves building a dam in the bas-fond to block the flow of water and accumulate the water in the dam. Both methods are effective in controlling the outflow of surplus surface water. Water availability can be sustained at least until the beginning of the dry season.

(2) Groundwater development

The potential for groundwater development by geology is described below.

① Sand dune zone: There may be a large quantity of groundwater stored in the sand dune zone because of the continuous distribution of sand dunes over an extensive area (each dune is about 5km wide and 50 or 60km long with a maximum depth of 5m or more). The groundwater level is relatively stable throughout the year and is in the shallow layer. Sand dunes have developed more in the Sahel Region (north of Dori) where the yearly rainfall is low.

② River deposits: River deposits are distributed along bas-fond with relatively large basin areas in and around the sand dune zone. The deposit depth is about the same that of the dunes in the vicinity. As the aquifer can be considered part of the sand dune zone, groundwater exists at a stable level throughout the year. These deposits are seen in the Sahel Region (north of Dori).

③ Bedrock area: Groundwater is contained in the weathered surface stratum and in tiny fractures deep in the bedrock. To obtain a stable supply of groundwater, it is necessary to dig a deep well or a well with a large diameter. As the ground surface is close to the groundwater level in the bas-fond, the boring depth is short.

The groundwater level rises and falls depending on the rainfall, but there are no reports of the groundwater level falling year by year. The amount of water used at present does not exceed the recharge from upstream in most cases and is therefore sustainable. In other words, the groundwater level in the deep layer is stabilized regardless of seasonal changes, and the quality is much better than the surface water or groundwater in the shallow layer.

There are two ways of securing a stable supply of deep groundwater.

① A large-diameter well is dug in relatively low ground such as a bas-fond. Drilling is continued until an adequate water level is secured even in the dry season.

② A borehole is dug and equipped with a pump. This method requires that residents are able to provide sufficient finance and labor for maintenance and that they have access to a reliable maintenance company.