Republic of Côte d'Ivoire
Ministry of Industry and Mines

The Project for Supporting Formulation of Industrial Sector Policy Focused on Technology Innovation and Dissemination in the Republic of Côte d'Ivoire

Final Report (Summary)

October 2017

JAPANESE INTERNATIONAL COOPERATION AGENCY

IMG Inc.

IL
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Map

Exchange rate (October 2017)
1 USD = 112.72 JPY
1 USD = 598 CFAF

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Abbreviations

AFD	Agence Française de Développement	French Development Agency
AGEDI	Agence de Gestion et de Développement des Infrastructures Industrielles	Industrial Infrastructure Management and Development Agency
ANADER	Agence Nationale d'Appui au Développement Rural	National Support Agency for Rural Development
BAC	Baccalauréat	University Entrance Diploma
BSTP	Bourse de Sous-Traitance et de Partenariat de Côte d'Ivoire	Cote d'Ivoire Subcontracting and Partnership Exchange
BT	Brevet de technicien	Technician Diploma
BTS	Brevet de Technicien Supérieur	Higher Technician Diploma
CCC	Comité Conjoint de Coordination	Joint Coordinating Committee
CCC	Coffee and Cocoa Council	Coffee-Cocoa Council
CCICI	Chambre de Commerce et d'Industrie de Côte d'Ivoire	Côte d'Ivoire Chamber of Commerce and Industry
CEPICI	Centre de Promotion des Investissements en Côte d'Ivoire	Center for Promotion of Investments in Côte d'Ivoire
CIE	Côte d'Ivoire Engineering	Côte d'Ivoire Engineering
CDT	Centre de Démonstration et de Promotion de Technologies	Center for Technology Demonstration and Promotion
CETI	Collège d'Enseignement Technique Industriel	College of Industrial Technical Education
CGECI	Confédération Générale des Entreprises de Côte d'Ivoire	General Confederation of Côte d'Ivoire Enterprises
CODINORM	Côte d'Ivoire Normalisation	Cote d'Ivoire Standardisation
CNMCI	Chambre Nationale de Métiers de Côte d'Ivoire	Côte d'Ivoire National Chamber of Trades
CPMME	Centre de Perfectionnement aux Métiers de la Mécanique et de l'Électricité	Professional Development Center for the Mechanical and Electrical Trades
CPTI	Centre de Perfectionnement aux Techniques Industrielles	Professional Development Center for Industrial Technology
DGAI	Direction Générale de l'Activité Industrielle	General Directorate of Industrial Activity
DGMG	Direction Générale des Mines et de la Géologie	General Directorate of Mines and Geology
DGPSP	Direction Générale de la Promotion du Secteur Privé	General Directorate for the Promotion of the Private Sector
DITI	Direction de l'Innovation et de la Technologie Industrielle	Directorate of Innovation and Industrial Technology
DUT	Diplôme Universitaire de Technologie	Technical University Diploma
ESI	Ecole Supérieure d'Industrie	College of Industry

FDFP	Fonds de Développement de la Formation Professionnelle	Vocational Training Development Fund
FIPME	Fédération Ivoirienne des Petites et Moyennes Entreprises	Ivorian Federation of Small and Medium Enterprises
IFAD		International Fund for Agricultural Development
I2T	Société Ivoirienne de Technologie Tropicale	Ivorian Company of Tropical Technology
INPHB	Institut National Polytechnique Félix HOUPHOUET-BOIGNY	Institut National Polytechnique Félix HOUPHOUET-BOIGNY
INS	Institut Nationale de la Statistique	National Institute of Statistics
IPNETP	Institut Pédagogique Nationale de l'Enseignment Technique et Professionnelle	National Pedagogical Institute for Technical and Vocational Education
MCAPPME	Ministère du Commerce, de l'Artisanat et de la Promotion des PME	Ministry of Commerce, Crafts and Promotion of SMEs
MENETFP	Ministère de l'Education Nationale et de l'Enseignement Technique et de la Formation Professionnelle	Ministry of National Education and Technical Education and Vocational Training
MESRS	Ministère de de l'Enseignement Supérieur et de la Recherche Scientifique	Ministry of Higher Education and Scientific Research
MFI	Microfinance Institution	Microfinance Institution
MGS	Mutual Guarantee Scheme	Mutual Guarantee System
MIM	Ministère de l'Industrie et des Mines	Ministry of Industry and Mines
MPME	Mouvement des Petites et Moyennes Entreprises	Movement of Small and Medium Enterprises
NC	Numerical Control	Numerical Control
OECD		Organisation for Economic Cooperation and Development
ONDR	Office National pour le Développement de la Riziculture	National Office for Rice Development
PACIR	Programme d'Appui au Commerce et à l'Intégration Régionale	Support Program for Trade and Regional Integration
QCD		Quality, Cost and Delivery
R&D		Research and Development
STGI	Sciences et Technologies du Génie Industriel	Industrial Engineering Science and Technology
SME		Small- and Medium-sized Enterprise
TOT		Training of Trainers
UNIDO		United Nations Industrial Development Organization
UFHB	Université Félix Houphouët-Boigny	Félix Houphouët-Boigny University

Summary

Introduction

In Côte d'Ivoire, it will be possible to manufacture more products in the country thanks to the relative advantage Ivorian industry has by the high technological level of engineers and workers compared to the other countries in the region. After selecting five high-growth sectors in the New Industrial Policy adopted by the government in 2013, the Ministry of Industry and Mines (MIM) has undertaken to develop action plans and strategies for each of these sectors. It is with this in mind that the Ivorian government asked the Japanese government to support the development of sectoral industrial policies.

Following the mission of the Detailed Planning Survey of the Japanese International Cooperation Agency (JICA), which took place from May to June 2014, the JICA and MIM agreed on the implementation of the "The Project for Supporting Formulation of Industrial Sector Policy Focused on Technological Innovation and Dissemination" ("Project"). This Project is based on the conviction that it is important to implement concrete action for innovation of technologies for small and medium industries ("SMI") which produce processing machines for the agro-industry sector and mechanical parts (hereafter "targeted technologies"), and which are necessary to assess the impact of this action in order to integrate it into the policy to be followed. The JICA has mandated the Japanese consulting firm IMG Inc. to carry out this Project, launched in February 2015.

In order to develop the policy, Project team took the following approach: (1) analysis of agricultural and agro-processing product sectors, including examination of comparative advantages of these products on the world market; (2) evaluation of the level of technology for the targeted SMI in order to identify the technologies and machines most used in each sector; (3) the review of technological and operational capacities of institutions under the auspices of the MIM (the Ivorian Company of Tropical Technology (I2T), the Center for Demonstration and Promotion of Technology (CDT)); (4) clarification of their roles and the institutional capacity to support SMIs so that they can overcome their challenges and contribute to agro-industrial development. The preliminary draft of the policy on technology innovation and dissemination was developed from the analysis above. The feasibility of major actions proposed in the policies was confirmed through implementation of the pilot project.

Chapter 1 Background and Justification of the Policy

This policy is intended to describe the roadmap for development of enterprises manufacturing machinery and mechanical parts used in the agro-industrial sector, the most important sector of the Ivorian economy (hereafter the "targeted sector").

The importance of the policy of innovation and technology dissemination is measured through two factors: creation of added value and accumulation of intellectual property. Given the constraints related to importing machinery and parts (transport costs, delivery time, etc.), ordering the manufacture or repair of parts directly from Ivorian enterprises has several advantages compared to purchasing these parts

abroad (creation of added value). Research and development to select the necessary machines and determine their specifications with reference to the needs of customers is of paramount importance. This approach is a source of innovation and an important step in the development of intellectual property (accumulation of intellectual property). Innovation and the accumulation of intellectual property bring competitiveness to businesses. The development of enterprises with high competitiveness leads to an improvement in the high competitiveness of the country's industry as a whole.

Quality (Q), cost (C) and delivery time (D) are the three elements that determine competitiveness in the manufacturing sector, and enterprises target their level of QCD according to market demand. As indicated above, most of the machinery and parts for processing agricultural products found on the local market are imported. Access to this market means entering international markets and therefore competition with other foreign products. Enterprises entering these markets are therefore obliged to achieve a level that lets them compete with these foreign products in QCD terms.

A competitive enterprise with intellectual assets is able to hire graduates from major national universities and train them even more. Several enterprises in Côte d'Ivoire are in this situation, leading to an accumulation of intellectual property in the country. In addition, competitive enterprises that manufacture machinery and parts for processing agricultural products can manufacture machines and parts from other sectors using the same technologies. They can therefore function as a complementary industry supporting a large number of industrial activities in Côte d'Ivoire.

In addition, it should also be pointed out that there would be an enormous demand for agro-industrial machinery in the countries of the West African subregion which share the same climatic zone and therefore produce the same types of agricultural products.

On the basis of the above elements, it was decided in consultation with MIM that the long-term sectoral policy vision would be that "Cote d'Ivoire becomes the subregional hub of manufacturing agro-industrial machinery by 2030". With this in mind, the aim is to develop in the long term a set of SMIs in the targeted sector capable of making machines and parts of high quality and high competitiveness.

Chapter 2 Challenges and Issues of the Targeted Sector

According to statistical data from the National Institute of Statistics, there were 14,315 enterprises in Côte d'Ivoire in 2014. According to sector classification based on the same data, the sectors concerned by manufacturing machinery and parts for processing of agricultural products covered by this policy are those of the "Manufacture of metal works, metalworking" and "Manufacture of machinery, equipment and others". In 2014, the two sectors accounted for 106 and 5 enterprises (111 in total), respectively, with 968 and 52 employees. The turnover of these two sectors amounted to 13,140 million CFAF, with an added value of 3,046 million CFAF. Among the enterprises in these two sectors, SMI that are prioritised by MIM are the targeted enterprises in the policy.

The key to making targeted enterprises "capable of producing high-quality and highly competitive machinery and parts" is to acquire the ability to supply products in a market where communication between enterprises is done through design and drawings conforming to international standards (hereafter the "quality market"). This ability of the targeted enterprises constitutes their competitiveness in terms of QCD. **The drawings are a tool to be used in accordance with international standards, which always indicates the QCD of the part to be manufactured. They are also a means of communication between design and manufacturing, which makes it possible to consistently achieve the QCD required by the market.**

In developing countries such as Côte d'Ivoire, QCD competitiveness is often determined by the size of the enterprise. Large enterprises can achieve QQD competitiveness with their sufficient capital. As far as SMIs are concerned, most fail to obtain the information required to access the quality market, because they do not have the necessary staff or resources to collect information, or do not know where find the sources of information. Staff involved in design and manufacturing within SMIs often work without the opportunity to receive the minimum training needed for design and manufacturing. Even if they are able to recruit staff who have received higher or professional training, they find it difficult to improve their level in order to achieve that required by the quality market. Most targeted enterprises have also other concerns such as procurement of suitable materials for high-quality machinery, promotion of their products, management of an enterprise to improve competitiveness, access to finance, and access to land for industrial activity.

Chapter 3 Support for Strengthening Targeted SMIs

The three public organizations under the auspices of the MIM, which are intended to support the targeted sector, are I2T, CDT and CIE. MIM supports the development of industrial policy, I2T supports R & D, CDT supports promotion and dissemination of technology, and CIE supports mass production using technologies developed by I2T.

In addition to MIM, higher, professional and technical training is provided by the Ministry of Higher Education and Scientific Research (MESRS), the Ministry of National and Technical Education and Vocational Training (MENETFP) and other organizations under their supervision, which are mandated to train engineers and technicians with basic knowledge of technologies. These ministries and their technical institutions face the same problem: lack of practical capacity of teachers and insufficient equipment that are necessary for human resources development. The Ministry of Commerce, Crafts and Promotion of SMEs (MCAPPME), which is responsible for promoting SMEs, is also involved in strengthening the capacity of targeted enterprises, since SMIs are the main target of this sectoral policy.

Private entities are also able to carry out support activities for targeted SMIs.

The mission of the Côte d'Ivoire Subcontracting and Partnership Exchange (BSTP) is to facilitate the linkage of services and products provided by SMIs with the demand of large enterprises. The Côte

d'Ivoire Chamber of Commerce and Industry (CCICI), the National Chamber of Crafts of Côte d'Ivoire (CNMCI), the General Confederation of Côte d'Ivoire Enterprises (CGECI), the Ivorian Federation of Small and Medium Enterprises (FIPME) and the Movement of Small and Medium Enterprises (MPME) promote the interests of their member enterprises, and provide appropriate support to the various needs of members.

Strengthening of targeted sector requires not only technology support but also for management. Since MIM is not mandated to provide all the support required, MIM must take initiatives to ensure that the targeted sector is supported in an integrated manner in partnership with other departments and private entities that are already dedicated to supporting enterprises.

Chapter 4 Vision and strategy of the support policy for the targeted SMIs

The objective is to develop a set of SMIs in the targeted sector capable of making machines and parts of high quality and high competitiveness. This policy mainly targets "SMIs who have a basic potential capacity to design and/or manufacture competitive machines that comply with the QCD requirements of the quality market". These enterprises can be divided into two groups for implementation of the policy: machine manufacturing enterprises of which design and manufacturing skills will be strengthened and subcontracting enterprises of which manufacturing skills will be strengthened. Not all the enterprises need to develop skills in machine design, because acquiring this is costly. **The target duration for the support strategy is 5 years.** A period of five years will allow fairly accurate forecasting of the future development of the targeted sector and market, as well as development of a design capacity in several enterprises.

To achieve the objectives set, the strategy is based on three axes:

(1) Strengthening governance of the targeted sector;

(2) Strengthening the competitiveness of targeted enterprises; and

(3) Improving the environment in which targeted businesses develop

The Policy aims at improving competitiveness of targeted enterprises with implementing action plans which are elaborated based on three axes.

Development and implementation of an effective policy or strategy on an economic sector requires the availability and command of data and statistics on this sector. For this purpose, MIM must collect basic data and statistics to have a good understanding of the issues and challenges of the targeted sector, with a view to developing support strategies and defining effective actions to strengthen the sector's competitiveness. This database, which will be updated each year, will allow MIM to monitor the annual development of the targeted sector, and to verify the effectiveness of its support to targeted businesses.

In addition, MIM and CDT could play this role as facilitator, taking advantage of their existing network with other public and private bodies, to support SMIs in developing business partnership networks among themselves.

The competitiveness of a manufacturing enterprise is linked, among other things, to the technological skills in design and manufacturing and the management skills essential to determine the objectives to be achieved and to implement daily activities. In order to improve the technological skill in design, it is necessary to invite an international expert with knowledge and experience in mechanical design. I2T will have to carry out projects to design machinery for processing agricultural products that have been identified and selected. By completing the design, the international expert will strengthen the competence of the targeted SMIs' engineers.

It is important that training on the basic technologies necessary for machine manufacture (especially turning, milling and welding) is provided to the targeted enterprises and their subcontractors, in order to improve their technological level. These training sessions must be combined with training to improve the understanding of drawings. However, it will be necessary to strengthen the theory part of these courses in collaboration with vocational school teachers who are competent in this field, because the theory level of I2T trainers is not high enough compared to their practical level. As for training to improve the comprehension of drawings, it will be necessary to train the trainers first before new training can be carried out.

It will therefore be necessary to introduce to I2T machines that allow efficient manufacture of machines using technologies that are not yet available in Côte d'Ivoire. These machines will enable I2T to provide SMIs not only with training on new technologies and maintenance methodology, but also in machining services.

Analysis of this information will allow MIM to communicate with the relevant training institutions so that their training programmes (level and content) are better suited to the needs of industries, helping them to comply with this policy.

It is essential to provide enterprises with the skills to define realistic objectives and to invest the necessary resources in a timely manner. These skills consist not only of technologies (human resources and machinery) but also the skills to mobilize and control funds and materials, collect market information and develop a growth strategy. To do this, this policy aims to improve the knowledge of the targeted businesses' management, enabling them to better take advantage of the opportunities that MIM can provide in implementation of the policy, such as access to market information, training to improve their technological level and meetings with financial institutions.

It is desirable for CDT to expand its services by organizing trade shows and promoting enterprises and their products by means of brochures or websites, etc., while putting them in contact with sellers and buyers.

In addition to the MCAPPME initiative such as establishing guarantee systems, the CDT can conduct activities of awareness-raising, intermediation and reconciliation to bridge the gaps in information between targeted businesses and banking institutions.

With the aim of promotion of access to land for industrial activity, the government is in the process of developing an industrial area. It is necessary for the Industrial Infrastructure Management and Development Agency (AGEDI), established under the auspices of MIM, to sensitize enterprises on the obligation and procedures, and to provide enterprises with support for acquiring land in an industrial area.

For the purpose of improvement of the price competitiveness of the products, it is therefore necessary for MIM to adopt a system of exemption from import duties for materials used in machinery manufacture or parts intended for the agro-industrial sector.

Chapter 5 Action plans

Based on the strategy in the Chapter 4, action plans are developed as shown in the following table.

Summary Table of Actions

Objective: Develop a set of SMIs in the targeted sector that can manufacture high quality and highly competitive machines and parts

Target period: 5 years

Axes	Actions	Objectives	Indicators	Budgets (total for 5 years)	(1) Organizations responsible and (2) Organizations involved
Strengthening governance of the targeted sector	Increasing the availability of data and statistics on the targeted sector	Have up-to-date data and statistics on the targeted sector	Updated database on enterprises in the sector available	100 million CFAF	(1) MIM
	Support development of relationships between the targeted enterprises as well as between the enterprises and the public bodies	Promote partnership and business relations by enterprises in the sector.	• Records of meetings • Association created and functional	50 million CFAF	(1) MIM (management) (2) CDT and SPX (implemented)
Strengthen the technological and managerial skills of enterprises	Strengthen design skills	Have 6 enterprises able to design equipment and mass production	• Drawings for mass production conforming to the international standard • Number of enterprises participating	996 million CFAF	(1) MIM and I2T (2) UFHB and INPHB
	Strengthen manufacturing skills	Have a set of enterprises capable of making quality parts.	• Number of enterprises participating in training • Number of participants	350 million CFAF	(1) MIM and I2T (2) IPNETP, Technical Centers and PFLP
	Support vocational and technical training (training of engineers and technicians)	Inform the ministries responsible of the needs of strengthening vocational and technical training.	• Report on the technological level of engineers and technicians • Number of meetings between ministries responsible and the international experts.	10 million CFAF	(1) MIM (2) MESRS and MENETFP
	Strengthen management capacity	Improve the management capabilities of the targeted businesses.	Number of enterprises participating in training	135 million CFAF	(1) MIM and CDT (2) MCAPPME, SPX and CCICI

	Introduce the KAIZEN method	Improve the productivity and quality of the products and services of the targeted enterprises.	• Number of CODINORM staff trained • Number of enterprises participating in training seminars	260 million CFAF	(1) MIM and CODINORM (2) SPX and FDFP
Improve the environment of the targeted sector	Support promotion of products from the targeted SMIs	Increase the sales volume of the targeted enterprises.	Number of enterprises whose sales volume is increasing	260 million CFAF	(1) MIM and CDT (2) SPX
	Promotion of access to financing	Increase the number of businesses that receive loans from financial institutions	• Database developed, number of training sessions organized • Number of enterprises submitting a file	90 million CFAF	(1) MIM and CDT (2) MCAPPME
	Promotion of access to industrial land	Increase the number of enterprises that move their premises to industrial land	Number of enterprises that submit a file	5 million CFAF	(1) MIM and AGEDI
	Promote price competitiveness of locally manufactured products (machinery and spare parts)	Improve the price competitiveness of the products of the targeted enterprises.	Import tax exemption regulation adopted	A specific budget is not required	(1) MIM

Introduction

1 Outline of the Project

After achieving independence in 1960, Côte d'Ivoire experienced remarkable economic growth known as the "Ivorian Miracle", with an annual growth rate of 11%, thanks to the massive production and export of agricultural primary materials such as coffee and cocoa. During this period, the country developed its infrastructure and positioned itself as the largest economic power among French-speaking countries in the West African region. However, the economic situation has deteriorated since the 1980s, due to falling prices for agricultural primary materials, inflation caused by the oil crisis and the failure of economic policy, resulting in a drop in average annual growth to -0.3%. Although the growth rate rose momentarily to 4.6% when the CFA franc (CFAF) was devalued in 1994, the economic stagnation has continued due to various political and military crises.

After overcoming the 2011 political crisis, the Ivorian economy quickly resumed its growth. Since 2011, the government has effectively worked to improve the business environment. Thanks to relatively developed industrial infrastructure and agricultural resources, natural wealth (oil and natural gas) and abundant mining resources (gold, diamonds, etc.) the country has become a key destination for foreign direct investment. The rate of growth rose to 9.8% in 2012, compared to -4.7% in 2011, and it was forecast at 8% for the following years. Food production rose from 11.62 million tons to 15.45 million tonnes, an increase of 27% in three years.[1] The Ivorian economy can be expected to increase its growth thanks in particular to an increase in internal demand.

On the basis of this perspective, it will be possible to manufacture more products in the country thanks to the relative advantage Ivorian industry has by the high technological level of engineers and workers compared to the other countries in the region (see "2-1 History of the target sector's development", Chapter 2). After selecting high-growth sectors in the New Industrial Policy adopted by the government in 2013, namely (i) the agro-industrial sectors, (ii) transformation of non-agricultural natural resources, (iii) structuring industries that support development of other industries,[2] (iv) consumer products, and (v) light manufacturing industries, the Ministry of Industry and Mines ("MIM") has undertaken to develop action plans and strategies for each of these sectors. It is with this in mind that the Ivorian government asked the Japanese government to support it in development of sectoral industrial policies.

Following the mission of the Detailed Planning Survey Team of the Japanese International Cooperation Agency (JICA), which took place from May to June 2014, the JICA and MIM agreed on the implementation of the "The Project for Supporting Formulation of Industrial Sector Policy Focused on Technological Innovation and Dissemination" (hereafter the "Project"). This Project is based on the conviction that it is important to implement, within the framework of the Project, concrete action for

[1] Source: National Development Plan 2012-2015

[2] Metallurgy and steel, cement and chemicals, etc.

innovation of technologies for small and medium industries ("SMIs") which produce agro-processing machines and mechanical parts (hereafter "targeted technologies"),[3] assess the impact of this action, and integrate it into the policy. This Project's Record of Discussions was signed in September 2014 between MIM and the JICA. The JICA has mandated the Japanese consulting firm IMG Inc. to carry out this Project, launched in February 2015.

2 Geographical scope of the Project

The study was conducted throughout the territory of Côte d'Ivoire, and mainly in Abidjan (particularly in areas where there are many enterprises that are likely to exploit the targeted technologies).

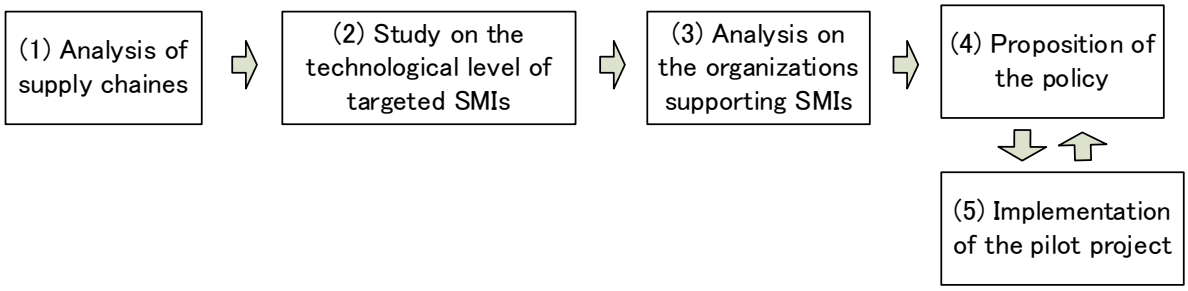
3 Composition of the project team members

Responsibility	Member
Mission Leader/Industrial Policy	Mr. Shinichi MORI
Dissemination of technologies/Access to financing	Ms. Mariko KANEKO
Analysis of industrial sectors	Mr. Nobuhisa IWASE Mr. Burneebaatar Gantumur
Analysis of industrial sectors / Access to financing	Ms. Akiko YONEYAMA
Production process	Mr. Katsuhiko CHINO Mr. Yasuyuki NAKAYAMA
Manufacturing technologies	Mr. Kunio KAWAKATSU Mr. Yasuhiro HARADA Mr. Kazuyuki TASHIRO Mr. Hiroshi KUSUNOKI

4 Methodology for development of the policy for the innovation and dissemination of technologies

The following approach was proposed in this Project for the innovation and dissemination of technologies:

[3] Consideration of the manufacture of agricultural machinery was also proposed by the project team. This was approved by the MIM in March 2016.



Analysis of agricultural and agro-processing product sectors, including examination of Côte d'Ivoire's comparative advantages on the world market, is the first step for development of sectoral policies for the targeted technologies. In this analysis, the technologies and machines most used in each sector are identified. The level of technology for the targeted SMIs is then evaluated, and the result is used to identify the machines and spare parts that the SMIs could produce. The review of technological and operational capacities of institutions under the auspices of MIM (the Ivorian Company of Tropical Technology (I2T), the Center for Demonstration and Promotion of Technology (CDT)) enabled clarification of their roles and the institutional capacity to support SMIs so that they can overcome their challenges and contribute to agro-industrial development. The preliminary draft of the policy on technology innovation and dissemination was developed from the analysis above. The feasibility of major actions proposed in the policy was confirmed through implementation of the pilot project, of which the results were reflected on the final draft of the policy.

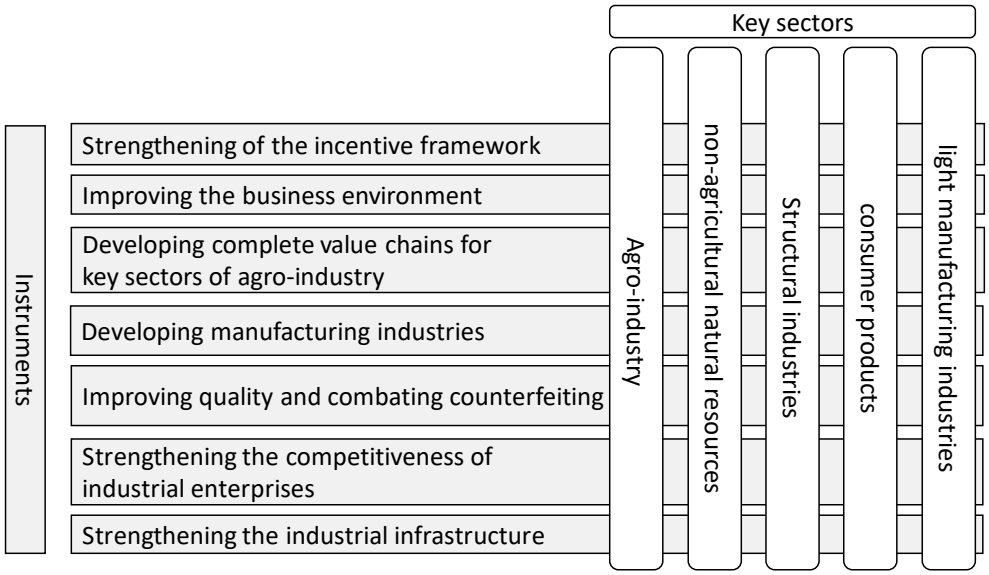
Chapter 1 Background and Justification of the Policy

1-1 Côte d'Ivoire's industrial policy

MIM, in its Note on Industrial Policy published on April 4, 2016,[4] defined the main industrial policy goal as to "significantly increase the contribution of the industrial sector in the creation of wealth and employment". The specific main objectives are "to strengthen the production-processing link in order to create more added value and a large number of decent and sustainable jobs " and "to create new centers for development of industrial sectors".

The focus for development of the policy concerns five key fields: (i) agro-industry (palm oil, cashew nut, cotton-textile, cocoa, rubber, fruits and vegetables, etc.); (ii) non-agricultural natural resources (mining, oil, gas); (iii) "structural" industries (metallurgy and steel mills, cement, chemicals, etc.); (iv) consumer products (textiles, packaging, generic medicines, etc.); (v) light manufacturing industries (assembly, equipment, etc.).

The industrial policy is implemented through seven instruments: (i) strengthening of the incentive framework; (ii) improving the business environment; (iii) developing complete value chains for key sectors of agro-industry; (iv) developing manufacturing industries; (v) improving quality and combating counterfeiting; (vi) strengthening the competitiveness of industrial enterprises; (vii) strengthening the industrial infrastructure.



Source: Prepared by the project team on the basis of the "Note on Industrial Policy" (April 4, 2016), Ministry of Industry and Mines

Figure 1 Support structure defined in the industrial policy (Promising sectors and instruments)

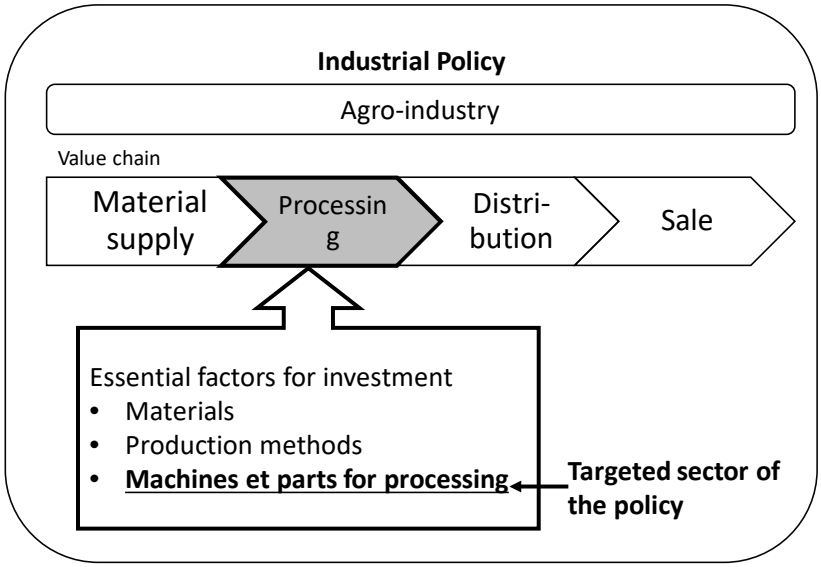
[4] MIM "Note on Industrial Policy", April 4, 2016

1-2 Positioning and target of sectoral policy

Côte d'Ivoire is a country whose economy relies mainly on agriculture. It is the world's leading producer and exporter of cocoa and cashew nuts. It also produces and exports other agricultural products such as coffee, rubber, cotton, pineapples, and mangoes. Most agricultural products are currently exported as primary materials. The government of Côte d'Ivoire aims to process them locally to increase their added value, which will strengthen the country's economy.[5]

Agro-industry is considered by MIM as the most important sector among the key areas mentioned above. A package of measures aimed at increasing the rate of processing agricultural products was implemented by the Ivorian government with the support of the technical and financial partners.

The sectoral industrial policy, development of which is supported by this Project, aims to enable local production of agro-processing machinery and mechanical parts for agro-industrial machinery, both of which are important and necessary elements for processing agricultural products. This policy is therefore intended to describe the roadmap for domestic production of manufacturing machinery and mechanical parts used in the agro-industrial sector, the most important sector of the Ivorian economy (hereafter the "targeted sector").



Source: Prepared by the project team

Figure 2 Positioning and target of the sectoral policy

1-3 Importance of this sectoral policy

The importance of the policy of innovation and technology dissemination is acknowledged through several factors.

[5] According to the document distributed by MIM at the government meeting on July 10, 2014, the government aims to raise the rate of added value of the secondary sector in the GDP from 25% to 40% by 2020 through increasing the processing of each agricultural product. The Government's Commitments, "Industrial and Mining Policies for the Emergence of Cote d'Ivoire", Jean-Claude BROU, Minister of Industry and Mines, Abidjan, July 10, 2014

1-3-1 Creation of added value

Despite a long period of economic stagnation and political unrest, Côte d'Ivoire has benefited from significant foreign investment. Data on foreign direct investment in the industry for 2008 and 2009 show that these investments were mainly for agricultural and agrifood production.[6]

Table 1 Direct investment in the industry (millions CFAF)

Industry	2008		2009	
	Amount	Share	Amount	Share
Agricultural and agrifood products	71,924	31.1%	109,840	42.8%
Telecommunications	83,365	36.0%	73,712	28.7%
Services	9,922	4.3%	22,475	8.8%
Medical	23,093	10.0%	12,226	4.8%
Oil and gas Products	3,914	1.7%	5,905	2.3%
Printing	950	0.4%	5,499	2.1%
Machinery, steel industry	13,875	6.0%	4,106	1.6%
Glass Industry	0	0.0%	4,083	1.6%
Forestry	3,693	1.6%	3,533	1.4%
Plastics	4,078	1.8%	3,171	1.2%
Tourism, Hospitality	6,222	2.7%	3,804	1.5%
Fisheries	0	0.0%	1,646	0.6%
Mines	514	0.2%	1,574	0.6%
Trade	1,438	0.6%	968	0.4%
Transport	4,435	1.9%	604	0.2%
Other	4,059	1.8%	3,421	1.3%
Total	231,482	100.0%	256,567	100.0%

Source: Center for Promotion of Investments in Côte d'Ivoire (CEPICI): Major infrastructure projects are not included as the CEPICI data do not include projects from the upstream domains (energy, construction, real estate and finance). With regard to trade and transport, projects of more than 0.5 billion CFAF are taken into account.

Economic recovery took place after the end of the political crisis in 2011 thanks to the increase in foreign investment. There are diverse targets for investment: cement manufacturing, hospitality and mining industries, and also agricultural and agrifood production.[7]

Investments related to agro-industry go together with the construction of agro-industrial plants and the supply of machinery/equipment/parts.[8] According to trade data published by UN COMTRADE, the total amount of imports for Côte d'Ivoire in 2015 was USD 7.4 billion, of which USD 0.92 billion,

[6] Source: "Report on the collection/verification of basic information on support for private sector development in the Republic of Côte d'Ivoire", Japan International Cooperation Agency, September 2013, P57

[7] According to the JETRO (Japan Foreign Trade Organization) global investment report, 104 investments were made in 2013 (50 more investments than the previous year) for 192.7 billion CFAF (67% increase). The first investment target was cement manufacturing, followed by investments related to oil exploitation, agricultural and agrifood production, fishing and hospitality. The number of investments made in 2014 increased by 39 compared to the previous year, reaching 104 (with a record investment amount of about 513.8 billion CFAF)

[8] Most of these machines/equipment/parts were imported from abroad and maintenance of machines for a specified period is often included in the purchase contract. However, according to interviews carried out within the framework of the Project, the machinery/equipment would be imported even if Ivorian companies could manufacture it in the country.

or 12.43%, were for imports of machinery and parts. The total imports of parts and equipment that could be manufactured by the targeted SMIs amounted to USD 0.3 billion in 2015.

Given the constraints related to importing machinery and parts (transport costs, delivery time, etc.), ordering the manufacture or repair of parts directly from Ivorian enterprises has several advantages compared to purchasing these parts abroad. The Project team found during interviews that there are enterprises that want to source mechanical parts locally (Table 2). This means that these enterprises can become major customers for the targeted SMIs.

Table 2 Potential customers for mechanical parts that could be manufactured in Côte d'Ivoire

Company	Agricultural products to be processed	Size of company (capital) (2014)
Olam	Cashews, cocoa, coffee	EUR 10,815.18 million (consolidated total)
Dekeloil	Palm oil	EUR 3.04 million
Groupe Carré d'Or / SDTM[9]	Rice (packaging of imported rice)	EUR 1.52 million (each)
PKL[10]	Rice	EUR 0.21 million
FTG[11]	Cotton	EUR 5.91 million
Olheol	Cotton oil	EUR 3.65 million

Source: Interviews by the project team

[9] Société de distribution de toutes marchandises

[10] Protein Kissée-La

[11] Filature et tissage de Gonfreville

Market for cashew processing machines in Côte d'Ivoire

Côte d'Ivoire has become the world's leading producer of cashew nuts,[12] with production of 702,510 tonnes in 2015, which is projected to exceed 1 million tonnes by 2020.[13] The processing rate in 2015 did not exceed 6%, the rest being exported without processing.[14] The Government places a high priority on processing cashew nuts, especially because cashew production is concentrated in the northern region where there is more poverty than in the southern region. The government also aims to reduce the influence of fluctuating global demand for primary materials on the national economy by promoting the processing of cashew nuts.

Cashew nuts are processed through the steps of cooking, sorting, shelling, drying and peeling. Currently, the machines and equipment needed for these steps are mostly imported from India, Vietnam or Sri Lanka. Since these machines are not of a high technological level, they could be manufactured locally like the threshing machine, being manufactured on an experimental basis within the framework of this Project. Although quality needs to be improved, some of these machines are already manufactured by Ivorian SMIs.

Investment by the private sector in cashew nut processing is on the rise. The total amount of investments made under the investment code by the 18 cashew nut processing companies between 2013 and 2016 was 6.4 billion CFAF.[15]

Calculated on the basis of this amount, the need for machinery required for cashew nut processing should reach, in total, 13 billion CFAF from 2015 to 2020, provided that the annual growth rate of 19% (rate achieved from 2010 to 2015) is maintained. In addition, cashew nut processors who have invested in Côte d'Ivoire face problems of breakdowns of machines and parts imported from abroad and long waits for the acquisition of spare parts. To solve these problems, they are asking MIM to promote development of manufacturers able to quickly perform repair and maintenance of these machines / spare parts. It is a market accessible by improving the technological level of the enterprises targeted by this policy, and the government therefore wishes to encourage Ivorian enterprises to actively access this market.

1-3-2 Accumulation of intellectual property

Japan's Ministry of Economy, Trade and Industry defines intellectual property as "intangible properties that constitute the source of an enterprise's competitiveness, such as human resources, technology, networks with customers or brands". It is therefore a broad concept covering property such as the organization, human resources or networks that can be assets for an enterprise in addition

[12] MIM, http://www.industrie.gouv.ci/?page=secteur_anacarde, page consulted on April 10, 2017, weight with shell

[13] MIM, calculated by the JICA project team on the basis of the data obtained from the web page http://www.industrie.gouv.ci/?page=secteur_anacarde (page consulted on April 10, 2017). The production volume in 2020 will be 1,293,060 tonnes with an average production growth rate of 13%.

[14] Processing of cashew nuts involves the process up to peeling, before roasting.

[15] The amount of investment allowed for cashew nut processing was 1,031 million CFAF in 2013, 1,121 million CFAF in 2014, 2,506 million CFAF in 2015 and 1,796 million CFAF in 2016.

to "intellectual property" such as patents or know-how".[16]

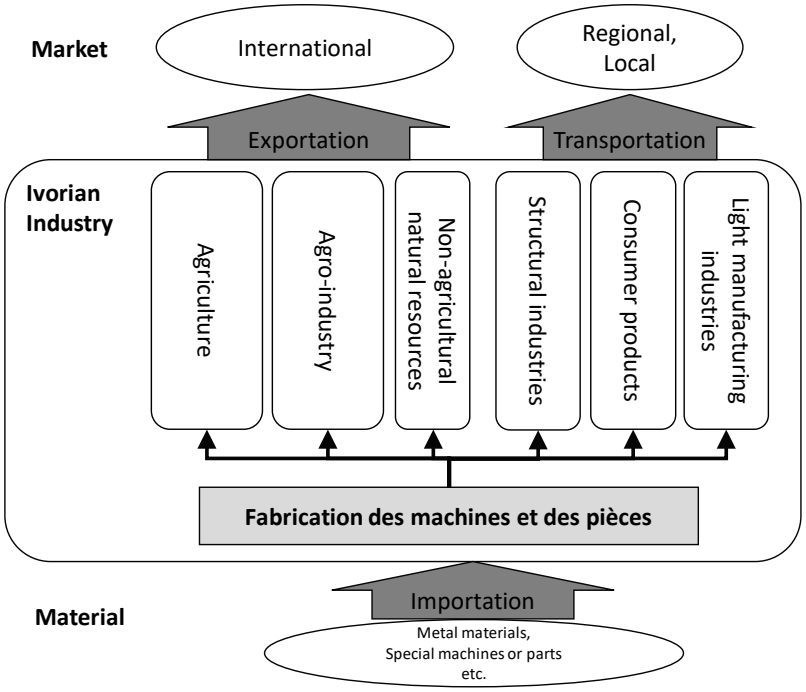
With promoting the processing of agricultural products being one of the priority sectors of the Ivorian government, the priority agricultural products targeted are cashew nuts, cocoa, coffee etc. Since these products are destined for international markets after their processing, quality requirements are strict. Consequently, the same level of quality is required for the machines and parts used for processing these products to ensure the quality of the processed products. Therefore, research and development to select the necessary machines and determine their specifications with reference to the needs of customers is of paramount importance. This approach is a source of innovation and an important step in the development of intellectual property. Innovation and the accumulation of intellectual property bring competitiveness to enterprises. The development of enterprises with high competitiveness leads to an improvement in the high competitiveness of the country's industry as a whole.

1-4 Development and perspectives of the targeted sector

Quality (Q), cost (C) and delivery time (D) are the three elements that determine competitiveness in the manufacturing sector, and enterprises target their level of QCD according to market demand. As indicated in section 1-3 above, most of the machinery and parts for processing agricultural products found on the local market are imported. Access to this market means entering international markets and therefore competition with other foreign products. Enterprises entering these markets are therefore obliged to achieve a level that lets them compete with these foreign products in QCD terms.

A competitive enterprise with intellectual assets is able to hire graduates from major national universities and train them even more. Several enterprises in Côte d'Ivoire are at the stage, leading to an accumulation of intellectual property in the country. In addition, competitive enterprises that manufacture machinery and parts for processing agricultural products can manufacture machines and parts from other sectors using the same technologies. They can therefore function as an industry supporting a large number of industrial activities in Côte d'Ivoire.

[16] Ministry of Economy, Trade and Industry of Japan, http://www.meti.go.jp/policy/intellectual_assets/teigi.html (page consulted on April 10, 2017)



Source: Prepared by the project team

Figure 3 Outlook for the target sector

In addition, it should also be pointed out that there would be an enormous demand for agro-industrial machinery in the countries of the West African subregion which share the same climatic zone and therefore produce the same types of agricultural products.

On the basis of the above elements, it was decided in consultation with MIM that the long-term sectoral policy vision would be that "**Cote d'Ivoire becomes the sub-regional hub of manufacturing agro-industrial machinery by 2030**". With this in mind, the aim is to develop in the long term a set of SMIs in the targeted sector capable of making machines and parts of high quality and high competitiveness.

Chapter 2 Challenges and Issues of the Targeted Sector

2-1 History of the targeted sector's development

Agricultural products such as coffee, cocoa, palm oil and rubber were introduced in Côte d'Ivoire in the 1880s when the country was not yet part of French West Africa and it was at that time that their commercial culture started.[17]

Agricultural product processing has been supported by the government of Côte d'Ivoire since independence in 1960. The local processing of palm seed was essentially provided up to the finished product by two national companies: Palm Industrie and Palm Ivoire (created in 1969), under the government policy of diversification of cash crops.[18] Palm Industrie had an engineering section that was responsible for design and construction of plants and production of machinery and parts for palm oil processing plants.

Palm Industrie was split in 1997 into three private enterprises : Palmci, SIPEF-CI (Société Internationale de Plantations et de Finance Côte d'Ivoire), and PALMAFRIQUE. The engineering section of Palm Industrie has been transformed into a national company called "CI-Engineering" (CIE), of which the government holds 74% of the shares. Processing of agricultural products that can have a significant impact on the economy requires large-scale processing plants, installation of machinery and procurement of spare parts. In Côte d'Ivoire, it was the CIE technology that made it possible to fulfil this need. This technology has continued to develop to meet the needs of forming the current technology base for manufacturing machinery and parts for the agro-industrial sector.[19]

2-2 Status of the targeted sector

According to statistical data from the National Institute of Statistics (INS), there were 14,315 enterprises in Côte d'Ivoire in 2014. According to sector classification based on the same data, the sectors concerned by manufacturing machinery and parts for processing of agricultural products covered by this policy are those of the "Manufacture of metal works, metalworking" and "Manufacture of machinery, equipment and others". Thus, the enterprises belonging to these two sectors are those covered by this policy (hereafter the "targeted enterprises").

However, the support strategy for this policy essentially targets SMIs, since more than 90% of enterprises in Côte d'Ivoire are SMIs, as in most countries of the world. In addition, the development of SMIs with specific technologies and the strengthening of partnerships between them are paramount to

[17] "2015 Study on the Foreign Regime, Study on the Cocoa Industry in Côte d'Ivoire, Mechanism on the Value Chain and on Marketing", Council Directorate of Foreign Trade and Investment, Abidjan Office, JETRO, November 2015

[18] The policy was implemented from 1963 to 1984. "Adoption oil palm in Côte d'Ivoire", Serge Nai Nai, Emmanuelle CHEYNS, François RUF, Article in Oilseeds and Fats, Crops and Lipids 7 (2): 155-165 · March 2000

[19] Several people within the management of the targeted SMIs acquired experience at Palm Industrie.

make local production of various types of parts possible.

In 2014, the two sectors accounted for 106 and 5 enterprises (111 in total), respectively, with 968 and 52 employees. The turnover of these two sectors amounted to 13,140 million CFAF, with an added value of 3,046 million CFAF.

Table 3 Indices by sector in Côte d'Ivoire

Sector	Number of enterprises	Turnover (millions CFAF)	Amount of value added (millions CFAF)	Capital (millions CFAF)	Number of employees
Manufacture of metal works, machinery and equipment, metal work	111	13,140	3,046	1,843	1,020
Food processing	334	40,400	5,503	12,560	4,624
Construction	1,309	94,019	4,076	14,320	4,881
Retail sales	3,389	441,342	35,821	27,325	14,385
Wholesale/Wholesalers	1,634	348,946	11,906	33,840	11,037
Other	7,538	643,276	182,475	298,846	73,767
Total of all sectors	**14,315**	**1,588,621**	**102,361**	**430,142**	**109,714**

Source: National Institute of Statistics (INS)

The 23% rate, which represents the share of the value added in the turnover of the two sectors of the "Manufacture of metal works, metalworking" and the "Manufacture of machinery, equipment and others", is very high compared to the 14% of food processing sector. Although turnover per employee for these two sectors is, at 13 million CFAF, higher than that of the food processing sector (9 million CFAF), it is lower than those of the retail and wholesale sectors, which are respectively 31 million and 32 million CFAF. But the targeted sectors have a productivity per worker of CFAF 3 million, which is higher than the productivity of the retail and wholesale sectors of 2 million CFAF and 1 million CFAF respectively. This shows that development of the targeted sectors through growth in turnover and added value contributes to GDP growth.

Table 4 Productivity by sector in Côte d'Ivoire

Sector	Share of value added in turnover	Turnover per person (millions CFAF)	Value added per worker (millions CFAF)
Manufacture of metal works, machinery and equipment, metal work	23%	13	3
Food processing	14%	9	1
Construction	4%	19	1
Retail sales	8%	31	2
Wholesale/Wholesalers	3%	32	1
Other sectors	28%	9	2
Total of all sectors	6%	14	1

Source: INS

2-3 Issues for targeted SMIs

2-3-1 Characteristics of the market for targeted SMIs

The result of the study by visiting 28 targeted enterprises carried out as part of this Project demonstrates that the targeted enterprises are developing in the markets of "metal construction", "maintenance parts" and "processing machines for agricultural products", using the techniques of machining, cutting or welding (hereafter the "target market").

But the key to making targeted enterprises "capable of producing high-quality and highly competitive machinery and parts" is to acquire the ability to supply products in a market where communication between enterprises is done through design and drawings conforming to international standards (hereafter the "quality market"). This ability of the targeted enterprises constitutes their competitiveness in terms of QCD.

The three major factors relating to activities of enterprises that determine their QCD competitiveness in production of machinery and parts are: (i) information (to know the required QCD), (ii) design (to define the QCD to be achieved) and (iii) production (to achieve the QCD defined). While understanding the QCD demanded by the market, designers must give instructions to their production workshop using drawings on which the dimensions, materials and manufacturing methods to be adopted are indicated. This should make it possible to manufacture parts in a timely manner, taking into account the types and levels of manufacturing technologies that can be used. The production workshop carries out the instructions given on the drawings by sourcing appropriate materials and using the appropriate methods. **The drawings are a tool to be used in accordance with international standards, which always indicates the QCD of the part to be manufactured. They are also a means of communication between design and manufacturing, which makes it possible to consistently achieve the QCD required by the market.**

Among the three major factors determining QCD competitiveness, information is an indispensable factor for all enterprises. On the other hand, enterprises have the choice between the other two factors, design and manufacturing: producing the design within the enterprise while subcontracting the

manufacturing, or carrying out the manufacturing according to the drawings provided. In each case, the ability to communicate through drawings is an indispensable condition for enterprises.

In addition to these three factors, the supply of materials, which is closely related to the design and production, determines the achievement of the QCD for the products requested. Marketing must also be done effectively to ensure sale and delivery of products to the customers. By adequately mobilising manpower, assets and financial resources, enterprises implement these activities to achieve their objectives. The environment in which enterprises develop has a great influence on QCD competitiveness.

Conversely, in a market which does not require quality products (hereafter "the low-quality market"), the price and lead time become major elements determining the value of the products for which quality (except appearance) is not ensured. Drawings are not provided in a low-quality market and therefore consistent quality is not required of the manufacturers. That is why they are not able to acquire competitiveness in terms of QCD.

Table 5 Characteristics of markets with different qualities

Points	Quality Market	Low-Quality Market
Information	Manufacturers know the QCD required by the target market.	Manufacturers know the QCD required by each customer.
Design	Manufacturers develop drawings to achieve the QCD in a consistent manner and compliant with international standards.	Drawings only show appearance. No drawing or non-compliance with drawing
Manufacture	Manufacturers produce parts with appropriate materials and manufacturing methods (according to drawings).	Manufacturers must make the part by asking each time about the type of raw material and method of manufacture.
QCD Competitiveness	QCD is achieved in a way that meets the requirements of the market.	Price and delivery time are the major factors determining the value of the products.

Among the three markets in which targeted enterprises evolve, the "metal construction" market relates to agricultural product processing units, facilities for energy storage bases and infrastructure (partially). To the extent that the equipment supplied in this market must conform to international standards, a high level of QCD competitiveness is required from enterprises accessing that market. The number of Ivorian enterprises operating in this market is limited because they must have a significant financial capacity to have high competitiveness in terms of QCD.[20]

Many SMIs in the targeted sector are working on the "Parts for maintenance" market, including shafts and gears. These enterprises do not design products for this market, simply copying parts used in existing machines. The "maintenance parts" market allows coexistence of the quality market with the low-quality market. If an enterprise wants to receive orders from customers who work in the quality market, it must be able to procure suitable materials and have the technologies (personnel and machinery) necessary for the manufacture of parts according to the specifications indicated on the drawings.

In the "agricultural processing machinery" market, the level of quality or precision for each processing

[20] Five Ivorian companies are operating in this market and are classified in the "Machinery and equipment manufacturing" category of INS in 2014 and another company has been identified by the Project.

machine varies depending on the agricultural products to be processed. For example, sophisticated electronically controlled machines are used for the production of cocoa paste or butter (the primary processing products of cocoa) in order to ensure the quality of the finished products. On the other hand, for the relatively simple structural machines and functions used for shelling cashew nuts, the quality of the machines is less important because this primary processing does not have a great influence on the taste or flavour of the products. Although the technological level of the targeted Ivorian enterprises allows them work only in the second category of the market, they still have to resort to mass production when this market requires a certain volume of machinery. It is therefore a quality market where it is necessary to ensure consistent quality.

The market for processing machinery for quality agricultural products is currently dominated by imported machinery. The project team found only one Ivorian enterprise capable of operating in this market.[21] It has been highlighted through this Project that other enterprises that manufacture machinery for processing agricultural products in Côte d'Ivoire operate in the low-quality market by building individual machines upon request from specific customers. They do not have high design skills, but only on-the-job manufacturing skills, without the use of drawings.

2-3-2 QCD competitiveness of the targeted enterprises

In the targeted sector, enterprises that operate in the quality market are mainly large enterprises, while those operating in the low-quality market are small and medium-sized enterprises (hereafter "SMEs"). This is due to the fact that the ability of enterprises to access quality or low-quality markets is determined by their competitiveness in QCD and that in Côte d'Ivoire the size of enterprise determines the level of the three key factors (information, design and manufacture) for the QCD competitiveness.[22]

In developing countries such as Côte d'Ivoire, QCD competitiveness is often determined by the size of the enterprise. Large enterprises with significant financial capacity establish networks with national and international organizations to obtain information while having the staff capable of obtaining and analysing information in relation to demand in the quality market. They also have the personnel and machines that allow design and manufacturing on the basis of drawings that conform to international standards. They are thus able to recruit people who have received the appropriate training. Large enterprises have also the capacity to train newly recruited employees in the field to improve their level. As for production, QCD competitiveness is determined not only by the knowledge of materials but also by the ability to supply materials that meet the customers request. Large enterprises are able to procure abroad when the required materials are not available in Côte d'Ivoire.

As far as SMIs are concerned, most fail to obtain the information required to access the quality market,

[21] Ivoire Ingénierie

[22] This information is based on the results of the study on the technological level of the targeted enterprises carried out through the visits as part of this Project as well as the pilot project "Improvement of Manufacturing Competence for Agricultural Product Processing Machines and Agricultural Machinery".

because they do not have the necessary staff or resources to collect information, or do not know where find the sources of information. Staff involved in design and manufacturing within SMIs often work without the opportunity to receive the minimum training needed for design and manufacturing.[23] Even if they are able to recruit staff who have received higher or professional training, they find it difficult to improve their level in order to achieve that required by the quality market.

Table 6 Difference in competitiveness by firm size

Points	Large Enterprises	Small and Medium Enterprises
Market concerned	Quality Market	Low-quality Market
Information	Enterprises have information on the needs of the quality market.	Enterprises have information about certain individual customers but do not have information on the overall market.
Design	Enterprises have the skills to design and develop drawings that conform to international standards.	Enterprises do not have the skills to design and develop drawings that conform to international standards.
Manufacture	Enterprises understand the specifications shown on the drawings and carry out continuous and efficient fabrication with materials that comply with the instructions.	Enterprises make parts on the job without using drawings. Even if they are capable of making parts with a satisfactory appearance, they do not have the capacity to ensure a consistent quality with an efficient production method.

2-4 Challenges faced by targeted SMIs

In the targeted sector, most SMIs are working in the low-quality market. These SMIs must improve their QCD competitiveness significantly if they want to access the quality market of agricultural processing machinery, which is targeted by this policy. But the improvement of their QCD competitiveness is hampered by internal constraints as well as by the environment in which they develop.

2-4-1 Gathering information

To meet market demand, enterprises need to improve the three factors that determine QCD competitiveness. However, SMIs, whose financial capacity is low, are not able to study the new market and carry out the R&D necessary to integrate the results of study in the form of product or technology. Nor do they have sufficient capital to invest in new technologies. It is therefore useful to create a mechanism that helps SMIs overcome the challenges they face by facilitating collaboration between them.

However, in Côte d'Ivoire there is no SMI association in the sector, which reduces the opportunities for Ivorian SMIs to know each other, in comparison with other countries. The absence of an association deprives the government of effective means of transmitting useful information to SMIs, such as information relating to the market, technologies and training for capacity-building. As a result, these enterprises continue to work in the low-quality market. As long as they remain in this market, they do

[23] There were people who did not know how to read or write among the employees of small enterprisees participating in the training in the "Improvement of the Machining Training System" and "Improvement of the System for Modern Technical Training in Welding" pilot projects carried out as part of this Project.

not feel the need to improve their design skills which is indispensable for quality improvement (Q) or their manufacturing skills to achieve Q, nor have opportunities to access information on the types or levels of Q required by the quality market. They do not know the approach to improving Q even if they have the willingness to do so.

2-4-2 Design and manufacturing

To ensure QCD in design and manufacturing, SMIs need personnel who have basic knowledge in each field. While engineers, especially in design, must have higher level knowledge (university, college, etc.), it emerged through implementation of the pilot project that many SMI engineers do not have knowledge or practical experience in the area of design, even though they have studied it in higher education.

In addition, people who work in manufacturing have been trained in a technical high school or a vocational and technical training center. Also, it was noted that the four schools or technical centers in Abidjan[24] which offer training in the field of metal machining only have obsolete equipment and therefore are not able to provide the practical lessons suitable for learners.

As a result, enterprises continue to operate using the same types and levels of technology in a market where there is only competition on C & D (Cost and Delivery) since it is difficult to differentiate at the Q level.

2-4-3 Supply of materials

In addition to the three factors mentioned above which determine QCD competitiveness, the supply of metal materials is also an essential factor in the manufacture of machines required by the quality market.

Machine manufacturers must choose the appropriate materials for each type of machine by having knowledge about the characteristics of various materials such as steel, whose price is relatively low, stainless steel whose resistance to corrosion is high, aluminum whose weight is low or bronze whose electrical or thermal conductivity is high. But the “Strengthening the Manufacturing Competence for Agricultural and Agro-processing Machinery” and “Establishment of a Material Supply System” pilot projects showed that SMIs do not have sufficient knowledge about the raw materials needed to ensure the level of QCD required by the market.

It is very difficult in Côte d’Ivoire to obtain materials whose QCD is guaranteed. Although steel for construction and civil engineering, as well as ordinary steel, are available in the country, the materials required for the manufacture of the machines (special steels, stainless steels, aluminum or bronze) are almost non-existent in the distribution channels.

[24] Lycée Technique d’Abidjan-Cocody, Centre de Perfectionnement aux Techniques Industrielles (CPTI) Yopougon, Centre de Perfectionnement aux Métiers de la Mécanique et de l’Électricité (C.P.M.M.E) Koumassi, Collège d’Enseignement Technique Industriel (C.E.T.I) Marcory

The targeted SMIs, and especially small enterprisees, therefore use substitute materials available on the second-hand market, while medium-sized enterprises order from wholesalers who import materials from abroad. However, the quality of the materials available on the second-hand market (which are moderately priced) is not guaranteed, while procurement via wholesalers takes too long (delivery time after the order: 2 to 3 months). Small enterprises do not have close links with wholesalers like medium-sized enterprises.

In addition, their lack of financial capacity for the storage of materials, as well as the lack of prior knowledge about the future needs of customers, prevents them from sourcing materials in a timely manner. Moreover, even when large Côte d'Ivoire distributors have stocks of materials suited for manufacture of machinery,[25] their prices are higher than those of the international markets.

Since most of the metal material needs in the country are for construction, the materials are not offered to enterprises in small quantities. As a result, even when materials suited to manufacturing machinery are available, the expenses borne by the enterprises are increased by the extra work required (cutting, etc.). It can therefore be concluded from the foregoing that a system of supply of metal materials satisfying all the QCD conditions demanded by the quality market does not exist in Côte d'Ivoire.

2-4-4 Marketing

Most of the targeted SMIs manufacture to order various types of products in small quantities to avoid the storage of products. As long as they depend on word of mouth to build a clientele, they will not be able to find customers who regularly place large orders. While they need to proactively explore the market, most of them do not even have a marketing strategy. Nor do they have a sales channel or a customer network.

2-4-5 Management

In general, enterprises need to mobilize the necessary resources in a timely manner, including manpower, machinery, materials and financial resources to carry out their activities. However in Côte d'Ivoire, enterprises, especially SMIs, do not have enough resources and management skills. SMIs managers in particular lack knowledge about the optimum use of limited resources. As long as enterprises work in a low-quality market, they do not feel the need to improve their management because they are satisfied with the low QCD level of their products.

2-4-6 Access to financing

Most of the targeted enterprises do not have the resources to develop machines that meet the requirements of the quality market, particularly because of the lack of financial resources. These resources are needed to acquire machines that can make parts and machinery with sufficient precision.

[25] Two major distributors, SOTACI and Barnabé, sell metal materials in Côte d'Ivoire.

Financial resources are also needed to be able to have enough space to do the manufacturing and to store a sufficient amount of metal materials.

Many SMIs continue to use obsolete machines, which do not allow producing parts and machinery of a higher and more consistent quality. In addition, the premises of many SMIs are too cramped, forcing some of them to carry out their work outside the boundaries of their land, and sometimes even on the public road. The budget required for a medium-sized enterprise to locate in the PK24 industrial zone is 300 to 500 million CFAF.[26] Finally, it should be noted that many enterprises do not have the working capital needed to buy metal materials.

Nearly all of the targeted enterprises have attempted to obtain credit to establish the necessary conditions for their activities. In spite of some progress in the granting of loans to SMEs by banks or microfinance institutions (hereafter "MFIs") in Côte d'Ivoire, the targeted SMIs are barely benefiting from these financial services. In many cases, no loans were granted even to medium-sized enterprises. The reasons for the refusal are not always communicated or clarified. Some enterprises have given up applying for a bank loan, put off by the large number of documents to be prepared and by the excessive time that banks take processing their file. Many targeted enterprises feel that the banks neglect SME loan applications and are only interested in larger loans that yield more profits. Many enterprises are frustrated by the length and complexity of the procedures to get a loan.

Other internal factors prevent targeted enterprises from benefiting from financial services. These include mismanagement, non-delivery of required documents such as the accounting balance sheet or business plan, or inadequacy of collateral. The difficulties that small enterprises face in obtaining loans are mainly related to the fact that they do not have the status of a legal entity, that they do not hold accounting records or that they cannot provide clear information about their business. Targeted enterprises who wish to buy manufacturing machinery, to expand their premises or to stock the materials necessary for machinery manufacturing do not have the means to do so without having access to the bank or MFI financing.

2-4-7 Access to land

Most targeted SMIs are not located in an industrial area but work in residential areas. Some are not able to find suitable land for their needs, although they want to move because of the confined size of their premises. Even if an enterprise was able to have land in an industrial area, it still could not build the infrastructure and buildings necessary for its activity, due to a lack of financial resources.

However, Decree No. 2017-145 of 1 March 2017 setting the conditions for establishing an industrial unit on land outside the industrial zones obliges any new industrial enterprise to be established in an industrial area and enterprises already in operation to be registered with MIM within 12 months of its

[26] Interviews with targeted SMIs in March 2017

effective date.

Despite adoption of the decree, prepared land available to date is insufficient to accommodate all enterprises including SMEs. For example, although there is a plan for the development of 940 hectares of industrial land in Abidjan, only 62 hectares were under development in June 2017.

Table 7 Internal factors hindering the growth of targeted enterprises

Points	Problems	Causes
Information	SMIs have information about individual clients but do not have mass information on the overall market.	• SMIs do not have qualified staff to collect information on the new market (problem of cost). • They do not know where the sources of information are.
Design	SMIs do not have the skills for design and development of drawings conforming to international standards.	• Design and drawing skills are insufficient. • Being in the low-quality market, SMIs do not feel the need to improve their design skills.
Manufacture	SMIs make parts on the job without using drawings. Even if they are able to make parts with a satisfactory appearance, they do not have the necessary capacity to ensure consistent quality with efficient production methods.	• There is only competition on C & D as long as a high Q is not required in the low-quality market. • Knowledge about the properties of materials is insufficient to choose according to production needs. • SMIs do not have sufficient capital to invest in new technologies.
Supply of materials	The prices of materials are high when the materials are not in stock, the time for importing is long and procurement in small batches increases the cost.	• The market is small and not sufficiently mature to allow SMIs to procure materials in small quantities.
Marketing	Targeted SMIs do not have customers who place regular orders.	• SMIs do not have a marketing strategy. • SMIs do not have a distribution network.
Management	SMIs lack management skills (accounting, human resources, materials procurement).	• Managers do not have enough knowledge about management. • As long as enterprises work in a low-quality market, they do not feel the need to improve their management.
Access to financing	SMIs are unable to use the services of banking institutions.	• It is not possible to make a timely investment because of the slowness and complexity of the process of reviewing credit files. • Inability of some SMIs to prepare credit application files. • (Internal factors: low management capacity; absence of documents such as accounting balance sheet, financial statements or business plan; lack of sufficient collateral)
Land	SMIs work on land that is not suitable for their activities.	• Lack of land available for industrial activity. • SMIs do not have the necessary means for development of the land and construction of infrastructure.

Chapter 3 Support for Strengthening Targeted SMIs

3-1 Overall view of support for strengthening the targeted sector

The three public organizations under the auspices of MIM, which are intended to support the targeted sector, are I2T, CDT and CIE. MIM supports the development of industrial policy, I2T supports R & D, CDT supports promotion and dissemination of technology, and CIE conducts mass production using technologies developed by I2T. As CIE is a corporation that operates as a private company that has no function to support SMIs, it will not be the subject of this chapter.

In addition to MIM, higher, professional and technical training is provided by the Ministry of Higher Education and Scientific Research (MESRS), the Ministry of National and Technical Education and Vocational Training (MENETFP) and other organizations under their supervision, which are mandated to train engineers and technicians with basic knowledge of technologies. Under the supervision of the MENETFP, the Vocational Training Development Fund (FDFP) is responsible for financial support for the development of human resources, subsidising training for contributing enterprises.

The Ministry of Commerce, Crafts and Promotion of SMEs (MCAPPME), which is responsible for promoting SMEs, is also involved in strengthening the capacity of targeted enterprises, since SMIs are the main target of this sectoral policy.

Private entities are also able to carry out support activities for targeted SMIs. The mission of the Côte d'Ivoire Subcontracting and Partnership Exchange (Bourse de Sous-Traitance et de Partenariat de Côte d'Ivoire: BSTP) is to facilitate the linkage of services and products provided by SMIs with the demand of large enterprises. The Côte d'Ivoire Chamber of Commerce and Industry (Chambre de Commerce et d'Industrie de Côte d'Ivoire: CCICI), the National Chamber of Crafts of Côte d'Ivoire (Chambre Nationale de Métiers de Côte d'Ivoire :CNMCI), the General Confederation of Côte d'Ivoire Enterprises (Confédération Générale des Entreprises de Côte d'Ivoire: CGECI), the Ivorian Federation of Small and Medium Enterprises (Fédération Ivoirienne des Petites et Moyennes Entreprises: FIPME) and the Movement of Small and Medium Enterprises (Mouvement des Petites et Moyennes Entreprises: MPME) promote the interests of their member enterprises, and provide appropriate support to the various needs of members.

Strengthening of targeted sector requires support not only for technology but also for management. **Since MIM is not mandated to provide all the support required, MIM must take initiatives to ensure that the targeted sector is supported in an integrated manner in partnership with other ministries and private entities that are already dedicated to supporting enterprises.**

Table 8 Support Structure for the Targeted Sector

Structure	Role
MIM	Development of sectoral policy and improvement of the environment
I2T	Development of technologies
CDT	Promotion of technologies
CIE	Mass production
MESRS	Training of Engineers
MENETFP	Training of Technicians
FDFP	Financing of human resource training
MCAPPME	Promotion of SMEs
Other private entities (BSTP, CCICI, CNMCI, CGECI, FiPME, MPME, etc.)	Promoting member interests and providing support to members

3-2 Status of support for targeted SMIs

The current status of the support by the organizations listed in 3-1 above is presented below.

3-2-1 Development of policies

MIM is responsible for providing information and data on the targeted sector and formulating policy for developing industries that manufacture machinery and parts. MIM has three Directorates General in MIM: the Directorate General for Industrial Activity (Direction Générale de l'Activité Industrielle: DGAI), the Directorate General for Private Sector Promotion (Direction Générale de la Promotion du Secteur Privé: DGPSP) and the Directorate General for Mines and Geology (Direction Générale des Mines et de la Géologie : DGMG).

The DGAI, which is responsible for strengthening competitiveness, promoting innovation and improving quality will be, through its Directorate for Innovation and Industrial Technology (Direction de l'Innovation et de la Technologie Industrielle: DITI), responsible for resolving the challenges of the targeted SMIs.

The DITI, under the DGAI, which is the counterpart of the Japanese project team, did not have basic data at the beginning of the Project (number of enterprises, number of employees, geographical location, turnover ...) necessary to formulate sectoral policy. It is the responsibility of the DITI to collect and analyse, with reference to the basic data collected during the Project, information on development of the market and technologies in the targeted sector, and to promote development of the sector and sensitize SMIs (refer to Chapters 4 and 5 for details).

3-2-2 Development of technologies

Development of technologies is one of the I2T's missions. Created in 1979 and 100% funded by the Ivorian government, I2T's mission is to conduct research and encourage technological innovation with the aim of promoting agro-industry.

Although I2T is one of the MIM's executing agencies, it has no strategy to support development of the targeted sector because MIM itself has not yet defined policy for promoting the sector. Therefore, I2T's current management is not carried out on the basis of a long-term vision.

The government and MIM are directing I2T to produce additional resources through the sale of its products to cover part of its budget. This is why I2T manufactures and sells machines developed in addition to its research and development mission. As a result, I2T is not able to carry out activities to strengthen the targeted SMIs' technical skills.

Not only can I2T not establish close relationships with enterprises in the targeted sector, but it is also considered by SMIs as a competitor because it manufactures and sells the same types of agro-processing machines as the SMIs. To avoid competition with private enterprises, I2T should find other means (such as the sale of patents) to finance the expenses related to developing prototypes. However, mass production is currently the only way it has to recover expenses because of the low capacity level for developing prototypes.

I2T's low level of development capacity is due to the lack of skills in planning new products, the lack of skills for machine design, the obsolescence of its equipment and the limited variety of its technologies.

I2T no longer undertakes new product development, but it reproduces its old research results or even simply manufactures products to order like the Ivorian SMIs. It also does not carry out market research, nor has the institutional capacity for product planning.

Its engineering office, which should play the pivotal role in machine development, has only two engineers. One of the engineers is a new graduate who has no practical experience in machine development and the other (designer) is quite experienced but will be retiring in two years. To continue machine development, it is essential that I2T is provided with human resources in quality and quantity. To this end, it is urgent to recruit design engineers for the engineering office to enable the transfer of skills from the experienced engineer. In contrast, while the manufacturing staff skill level varies depending on the type of technology, there are several in each workshop who have basic skills.

In addition, I2T often struggles to determine the quality and type of materials suited to the function and manufacturing method of the machines, which is one of the challenges associated with the supply of raw materials which the targeted SMIs face.

The equipment available to I2T is obsolete and their range is nearly the same as those of the targeted SMIs. There is a minimal quantity of the measuring equipment available in the workshops for examining quality.

It is possible to conclude from the foregoing that because of its institutional constraints, it would be difficult for I2T to take a lead in the field of technology among the targeted SMIs. It is therefore

necessary to reconsider the role to be played by I2T for developing the targeted SMIs and to establish its action plan according to the new role identified.

3-2-3 Dissemination of technologies

The CDT, established in 2007 as a subsidiary of I2T,[27] aims to disseminate innovative technologies to promote the agro-industrial sector, taking initiatives to resolve challenges relating to the sale of manufactured machines. Neither manufacturers nor sellers are found in Côte d'Ivoire for many of the machines requested by micro-enterprises and small local enterprises. The CDT therefore imports agricultural product processing machinery manufactured in foreign countries such as India and sells to enterprises or agro-processing associations to promote their activities. When there are local enterprises that are able to manufacture or sell these machines, the CDT presents these enterprises or their machines to the processors. In addition, the CDT rents its machines to local SMIs so that they can refer to it when developing a new machine. The mills, squeezers, flour ginders and cookers used for the production of acheke are examples of machines manufactured by local enterprises by reference to imported machines. The targeted SMIs and I2T manufacture these machines.

The CDT only maintains links with a few of the SMIs currently targeted. In order to meet the demands of micro and small processors of agricultural products as well as enterprises that want to buy spare parts or agro-processing machines, it would be advisable for the CDT to extend its network to the targeted SMIs and facilitate the sale of their products through a website. The CDT has a strong desire to undertake this activity.

3-2-4 Training of human resources

Training engineers and technicians is indispensable to improving the level of technology of the targeted sector. The MESRS is responsible for training engineers (especially designers) who are involved in product development, and the MENETFP is responsible for training technicians involved in product manufacturing. The institutions of higher education in Côte d'Ivoire under the supervision of the MESRS consist of six universities[28] and two colleges,[29] of which the Félix Houphouët-Boigny University (Université Félix Houphouët-Boigny: UFHB) and the National Institut of Polytechnique Félix Houphouët-Boigny (Institut National Polytechnique Félix Houphouët-Boigny: INPHB) offer programs in the targeted technologies. The MENETFP manages vocational training and issues various diplomas. Among the vocational and technical training centers, five centers offer courses related to the targeted technologies (referred to below), issuing Certificates of Professional Aptitude (Certificats

[27] The current activities of the CDT are not related to those of I2T.

[28] There are two universities in Abidjan (Université Félix Houphouët-Boigny and Université Nangui Abrogoua), and three universities in other cities, Bouake, Daloa and Korhogo (Université Alassane Ouattara, Université Jean Lorougnon Guédé, Université Péléforo Gbon Coulibaly, Université Virtuelle, respectively).

[29] There are two colleges in Abidjan: École Normale Supérieure and Institut National Polytechnique Félix Houphouët-Boigny (INPHB)).

d'Aptitude Professionnelle: CAP), Vocational Study Certificates (Brevets d'Étude Professionnelle : BEP), Technician Certificates (Brevets de Technicien : BT), Vocational Certificates (Brevets Professionnel : BP) and Advanced Technician Certificates (Brevets de Technicien Supérieur : BTS) depending on their curriculum.

<Université Félix Houphouët-Boigny>

The UFHB has a training programme in electromechanical and electronic informatics within the Training and Research Unit (Unité de Formation et de Recherche : UFR) for the sciences of the structures of matter and technology, in which 30 students are enrolled (10 to 15 graduates come out every year. Although it would be desirable to establish a partnership between the universities and the industrial sector, the UFHB does not currently carry out the specific technological research that could be used to solve the challenges that enterprises face. Its relationship with industry is currently limited to the large enterprises that receive its interns (internship is a condition for graduation in its programs).

UFR's workshop was renovated in 2016 thanks to funding from the government. This workshop is equipped with large machines such as a shearing machine and press brakes as well as a dozen of milling machines and lathes, including two numerically controlled lathes. However, given the limited number of students in this unit, these machines are not frequently used. Since there are no other workshops in Côte d'Ivoire that are equipped with large numbers of such new machines, it is desirable that this workshop be used more effectively as part of a partnership between government, academia and industry.

<Institut National Polytechnique Félix HOUPHOUET-BOIGNY>

INPHB is a college that was created in Yamoussoukro in 1996 by merging four colleges: the National College of Agronomy (École Nationale Supérieure d'Agronomie: ENSA), the National College of Public Works (École Nationale Supérieure des Travaux Publics: ENSTP), the Bouaké Agricultural Institute (Institut Agricole de Bouaké: IAB) and the Advanced National Institute for Technical Education (Institut National Supérieur de l'Enseignement Technique: INSET). It provides advanced training for engineers and advanced technicians in the fields of industry, commerce, administration, civil engineering, mining and geology, as well as technical training with certificates to students and enterprise employees. The Institute consists of 7 schools in addition to Preparatory Classes for College (Classes Préparatoires aux Grandes Écoles : CPGE). After completing the preparatory classes, students will choose one of the following 7 schools depending on the Diploma obtained:

- College of Public Works
- College of Mines and Geology
- College of Industry
- College of Agronomy
- College of Commerce and Business Administration
- School of Continuing Education and Executive Development

- Polytechnic Doctoral School

During the 2016-2017 academic year, 712 students attended the ESI, whose disciplines are closely related to the sector targeted by this policy. Three disciplines – Information and Communication Science and Technology, Industrial Engineering Science and Technology (IEST) and Process Engineering Science and Technology – are being delivered, and students are learning one of these three disciplines for two years after completing two years of preparatory classes. Students can obtain the University Degree in Technology (DUT) (equivalent to BAC + 3) from the training. After obtaining the DUT, students can seek employment or continue their engineering studies. These three-year studies allow them to obtain an engineering degree (BAC + 5).

The course that provides specialized training in mechanical design engineering related to the targeted sector is the IEST. The minimal knowledge about design engineering is given to students in the programs offered by the IEST.[30] However, students graduating from school without having the expertise in design engineering in the targeted field because they have hardly had the opportunity to learn the practice of design, according to the information gathered as part of this Project from students graduating from the INPHB.

Training of human resources with design engineering skills is indispensable for creation of the mechanics industry. If new graduates are to be able to produce immediate results, they must acquire the minimum skills at university. In order to create a mechanics industry, MIM will need to study and examine the knowledge required for a mechanical design engineer and ask the MESRS to integrate them into the INPHB and other universities' curricula.

<Vocational and technical training>

In Abidjan, there are five public institutions that provide courses on the targeted technologies, as shown in the table below.

[30] According to the analysis of the INPHB curriculum by the project team's design expert. (https://inphb.ci/1/vues/esi/index_formation.php).

Table 9 Public schools and courses in the targeted technologies

Vocational School	Course
Lycée Technique d'Abidjan-Cocody	Mechanical Fabrication, Electronics, Electrotechnology
Centre de Perfectionnement aux Techniques Industrielles (CPTI) Yopougon	General Mechanics, Boilermaking, Mechanical Maintenance (Evening classes)
Lycée Professionnel de Jacqueville	Maintenance of Production Systems, Electromechanical Maintenance, Mechanical Maintenance, Maintenance of Vehicles and Engines, Boiler Maintenance, Welding
Collège d'Enseignement Technique Industriel (CETI) Marcory	Metal Construction, Auto Mechanics, General Mechanics
Centre de Perfectionnement aux Métiers de la Mécanique et de l'Électricité (CPMME) Koumassi	Electromechanics, Electrotechnology, Refrigeration and Air Conditioning, Mechanical Welding

Source: Vocational schools (Note: underlined courses are those relating to the targeted technologies)

The project team found that most of the machines that these schools have are dilapidated and poorly maintained, and/or lack appropriate tools, which does not allow for good practical training for students. The only exception is a series of machine tools at the Lycée Technique d'Abidjan-Cocody, which were supplied by Spain in the 1990s and are well maintained. Since they are machines intended for production and not for education, they have been only used by a private enterprise that pays a rental fee.[31]

An analysis carried out by the project team on the CETI Marcory curriculum[32] revealed that the volume of practical learning requested in the curriculum would enable learners to acquire machining skills equivalent to second level standards in Japan. However, given the small amount of equipment in the center compared to one hundred learners and their poor condition, it is obvious that even acquiring machining skills equivalent to third level standards would be difficult.

3-2-5 Promotion of SMEs

One of MCAPPME's missions is to develop policies to support SMEs, identifying their common challenges. Among the weaknesses of the targeted SMIs are those related to management and financing.

In terms of financing, the Ivorian government has just taken measures (Phoenix programme, leasing, unsecured financing, etc.) to encourage the use of credit systems by SMEs. As a result, several banks want to expand their services to SMEs, as well as MFIs wishing to offer more services to SMEs rather than to individuals (see Figure 4).[33]

Although Ivorian banks have experience in lending to SMEs, they have not developed SME-specific services, because they assume that the risks associated with SMEs are relatively high. These banks

[31] A small enterprise in Abidjan was working with the machines that the Lycée Technique d'Abidjan-Cocody has under a rental contract with the high school. This enterprise paid monthly rental fees to the high school.

[32] Approximately 40% of the schedule is devoted to practical learning of turning, milling and assembling (16 hours per week).

[33] However, it should be noted that the definition of an SME differs from one financial institution to another.

generally take into account the speciality and personality of the manager as well as the possibility of business development, and always attach importance to the security and the balance sheet. As a result, the number of SMEs eligible for loans remains limited since the time and cost required to prepare these documents is considerable.

On the other hand, MFIs, which provide their services to social strata that do not have access to bank loans, are beginning to broaden their lending fields to SMEs in addition to individuals. For example, more than 30% of the amount of Microcred loans are extended to SMEs. However, MFIs do not have sufficient financial capacity to meet the dynamics of SME loan demand.[34]

Since SMEs' limited access to credit cannot be solved solely by private initiative, the Ivorian government has begun to examine the possibility of public support. In general, support given to SMEs by governments in other countries consists of: (i) direct loans to SMEs by public financial institutions, (ii) public guarantee credit systems for SMEs, and (iii) loans on a favourable basis to organizations carrying out investments or leases for SMEs.[35] The Ivorian government has begun to look at providing similar support. The MCAPPME plans to establish a public guarantee organization before 2018[36] within the framework of the Phoenix Programme aimed at strengthening SMEs in an integrated manner.[37] The Ministry also envisages setting up a training system aimed at strengthening the management capacity of SMEs to enable them to have better access to credit.

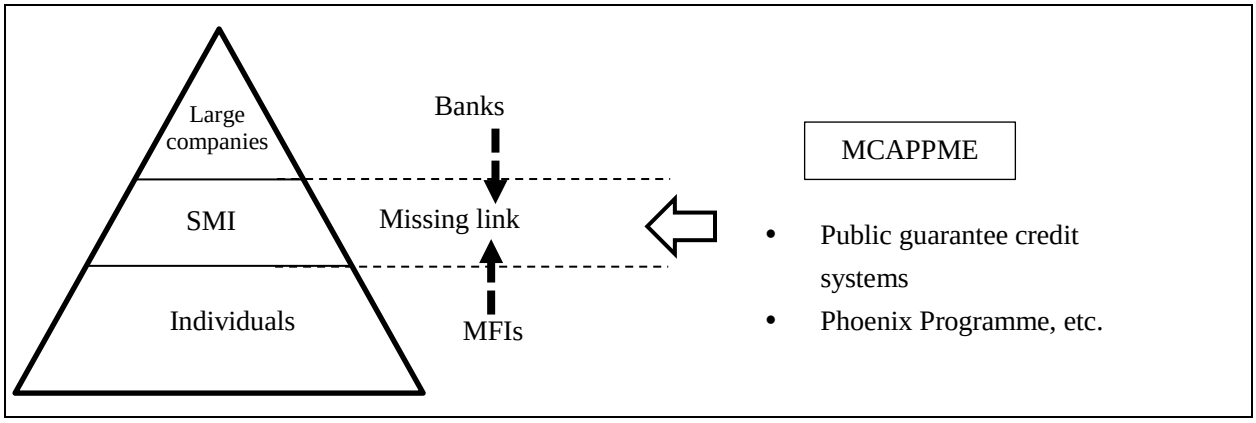


Figure 4 Lending scheme for Ivorian SMEs

[34] According to the consultant of the International Economic and Social Development Agency, the estimated demand for SME loans in Côte d'Ivoire in 2017 is 3.57 trillion CFAF. However, loans granted by banks and micro-finance institutions in 2017 cover about one-third of this amount.

[35] OECD. 2015. New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments; Loan guarantee funds IFAD

[36] The Public Investment Bank of France plans to invest 1.4 trillion CFAF, according to an interview with the MCAPPME in February 2017.

[37] The Phoenix Programme aims to formalise about 50,000 to 60,000 SMEs, create about 300,000 to 400,000 jobs and improve the contribution rate of SMEs to GDP by as much as 30 to 40% by creating 100,000 to 120,000 SMEs that are "competitive, dynamic and innovative" by 2020. To achieve this goal, it is working on (1) improving access to finance, (2) improving management capacity, (3) developing a spirit of entrepreneurship and (4) developing a SME environment. Kouadio Benie Marcel. 2017. The SME development strategy: Notable advances.

3-3 Summary of the challenges to public support

Table 10 summarizes the missions and challenges of public organizations that support targeted SMIs.

Table 10 Mission and current status of administrative bodies

Administrative body	Mission	Current status
MIM	Development of sectoral policy and improvement of the environment	• It does not have up-to-date data and statistics on the targeted sector.
I2T	Development of technologies	• MIM has not yet developed the specific development strategy for this sector. I2T is therefore not in a position to implement its support for SMIs. • The government does not provide the necessary means for I2T to carry out its mission of supporting the targeted sector. • Research on the market and techniques has not yet been carried out. • There are not enough qualified engineers for R&D. • The equipment is dilapidated and the range of technology is not very diversified. • Its engineering office does not have sufficient knowledge of the appropriate metal materials for the machines to be manufactured.
CDT	Promotion of technologies	• It maintains links with few of the currently targeted SMIs.
MESRS	Training of Engineers	• Practical courses to instil knowledge in students are insufficient (lack of practical capacity of teachers and insufficient equipment).
MENETFP	Training of Technicians	• The equipment is dilapidated. • Practical courses to instil knowledge in students are insufficient (lack of practical capacity of teachers and insufficient equipment).
MCAPPME	Promotion of SMEs	• The measures of the Phoenix Programme and public credit guarantee systems have not yet been implemented. • The programmes, projects and measures are not sufficiently known by the targeted enterprises.

Chapter 4 Vision and Strategy of the Support Policy for the Targeted SMIs

4-1 Vision

This policy of innovation and technology dissemination aims to make **"Cote d'Ivoire, the subregional hub of the industrial machinery manufacturing industry by 2030"**.

4-2 Objective

As mentioned in Chapter 1, the aim is to develop enterprises capable of producing high-quality machinery and parts that are competitive with foreign enterprises and products in the targeted sector for the long term. With this in mind, **the objective is to develop a set of SMIs in the targeted sector capable of making machines and parts of high quality and high competitiveness.**

4-3 Target and area of intervention

This policy mainly targets "SMIs that have a basic potential capacity to design and/or manufacture competitive machines that comply with the QCD requirements of the quality market". These enterprises can be divided into two groups for implementation of the policy:

- machine manufacturing enterprises of which the design and manufacturing skills will be strengthened;
- subcontracting enterprises of which the manufacturing skills will be strengthened.

Not all the enterprises need to develop skills in machine design, because acquiring this skill is costly.

When a machine is composed of several parts, even if its structure is relatively simple it will be necessary to outsource production of the parts to several enterprises because it is not rational to have all parts produced by a single enterprise. It would therefore be desirable for a large number of enterprises to work as subcontractors using their specific skills. If the required quality level for a machine (the finished product) is high, then the quality required for the parts comprising this machine will necessarily be high. The enterprise that designs and assembles a machine as well as the subcontracting enterprises must respect the quality demanded by the market and be conscientious, motivated and have a sense of responsibility. This is why this policy aims at simultaneously strengthening the design and manufacturing skills of "machine manufacturers" and the manufacturing skills of "subcontractors" in order to improve the sector as a whole.

4-4 Implementation period

The target duration for the support strategy is 5 years. A period of five years will allow fairly accurate forecasting of the future development of the targeted sector and market, and developing of a

design capacity in several enterprises. Since no Ivorian enterprise has yet had the experience of developing machines that meet the international standards of the quality market, it will take two or three years to develop a machine, even if the enterprise to be supported has the basic skills in machine design and manufacturing. Two cycles of MIM support for the development of a machine represent a five-year period.

4-5 Support strategy axes for targeted SMIs

To achieve the objectives set, the strategy is based on three axes:

(4) Strengthening governance of the targeted sector

(5) Strengthening the competitiveness of targeted enterprises

(6) Improving the environment in which targeted enterprises develop

4-5-1 Strengthening governance of the targeted sector

Strengthening governance requires implementation of two major actions:

- Strengthening the availability of data and statistics on the sector
- Developing relationships between the state and the enterprises and the enterprises themselves.

(1) Strengthening the availability of data and statistics on the sector

Development and implementation of an effective policy or strategy on an economic sector requires the availability and command of data and statistics on this sector. To do this, MIM must collect basic data and statistics to have a good understanding of the issues and challenges of the targeted sector, with a view to developing support strategies and defining effective actions to strengthen the sector's competitiveness.

This database, which will be updated each year, will allow MIM to monitor the annual development of the targeted sector, and to verify the effectiveness of its support to targeted enterprises. As part of collecting these data, MIM will have to carry out sectoral and market studies with a view to establishing a database. In addition, MIM itself will, through its technical services, make visits to the targeted enterprises to understand the reality of the activities they are conducting.

(2) Developing the relationship between the state and the enterprises and the enterprises themselves

SMIs are incapable of effectively obtaining market and technical information. Moreover, since these enterprises do not collaborate with other enterprises, there is very little exchange of information between them. In addition, if these enterprises fail to know the current state of their sector or the needs of the quality market, they will not feel the need to improve competitiveness in respect of QCD.

Government bodies must therefore take steps to ensure that the targeted enterprises are able to know the trends of the entire quality market, potential customers and information on the types and quality levels desired of the machines. This knowledge will allow them to develop with an overall view of the situation. MIM and CDT could play this role as facilitator, taking advantage of their existing network with other public and private bodies, to support SMIs in developing business partnership networks among themselves.

One of the essential conditions for such networks of enterprises to be sustainable is the capacity of these networks to provide its members with useful information. To achieve this goal, MIM and CDT will need to identify quality market candidates to target for the targeted enterprises while analysing market size, customer characteristics, types and quality levels of machines responding to the needs.

Secondly, MIM and CDT should encourage establishment of networks between public bodies and private enterprises by inviting SMIs to regular meetings in which the above-mentioned useful information will be provided. Opportunities for collaboration will also be provided to enterprises through the second axis of the strategy, “Strengthening the competitiveness of targeted enterprises”. Exchanging information with targeted SMIs through regular meetings will make it possible to establish links between public bodies and enterprises, as well as networks between enterprises, while raising awareness of the importance of partnership.

4-5-2 Strengthening the competitiveness of targeted enterprises

The competitiveness of a manufacturing enterprise is linked, among other things, to the technological skills in design and manufacturing and the management skills essential to determine the objectives to be achieved and to implement daily activities. This competitiveness must be strengthened so that the enterprise can develop in the quality market. To do this, the following actions need to be carried out.

(1) Strengthening technological capacity

(a) Strengthening design skills

This action aims to strengthen the design skills of enterprises that have a strong desire and the potential to access the quality market. These enterprises will be chosen from those that already have basic design technology. The machines that the selected enterprises will have to design with the support of the government will be chosen from those with high potential to be manufactured in Côte d’Ivoire, as described in the activity mentioned in 4-1 above.

The design capacity building activity must be provided by I2T of which the duty is to carry out the R&D. To do this, it is essential to make available to the I2T engineering office human resources specialized in design. In its current condition, I2T cannot assume this role because of the lack of design engineers. The human resources to be committed are those with a good knowledge and experience in designing machines that conform to international standards. Although people who have both expertise in

mechanical design and practical experience are not available in Côte d'Ivoire, it is possible to recruit people with knowledge and experience in facility design where the required skill is compatible with that of mechanical design. However, it is necessary to invite an international expert with knowledge and experience in mechanical design, because there are elements in the design of machines that cannot be realized by the design of facilities alone.

In the course of implementing this action, I2T will have to carry out projects to design machinery for processing agricultural products that have been identified and selected. In the course of the design, the international expert will strengthen the competence of the targeted SMIs' engineers and at the same time those newly recruited by I2T. Enterprises with improved design skills will be able to use subcontractors to manufacture the machines. This will also improve the technical capacity of these subcontractors. MIM will thus have to promote the development of these subcontractors through "Strengthening the Manufacturing Skills of Targeted Enterprises including Subcontractors" so that they are able to respect the quality and technical levels required by the quality market.

While design engineers of enterprises need to have knowledge of materials to meet quality market requirements, few have such skills. The CDT and I2T do not have sufficient knowledge to give advice to the targeted enterprises on the materials to be used.

To remedy this problem in the short term, an expert with the necessary knowledge can provide training to the targeted enterprises on the characteristics of metals, give advice on the selection of materials of which the quality and price are suited to the machine to be manufactured, and disseminate this knowledge (through preparation of a manual, for example). Demand for materials may increase once targeted enterprises begin to have the required knowledge of metal materials. This will make the material supply system to be implemented by the government profitable.

Example of supply of materials by governments

The system for buying/stocking/supplying metal materials used by SMEs in South Korea (Public procurement Service:PPS) can be cited as an example. Having taken full account of the various problems faced by SMEs, such as the high cost of supply related to purchasing materials in small quantities and irregularly, or to the low development of enterprises' supply networks due to their lack of experience with foreign suppliers, the government of South Korea launched a public system for supply of materials in 1974.

Since then, the PPS has been able to form networks with suppliers from countries in central Europe and China through which materials are imported in an efficient manner. The targeted materials are non-ferrous metals (aluminum, bronze, lead, tin and zinc), precious metals and other materials (building materials, forest products and recycled materials). PPS provides supply of materials and manages stocks on the basis of information collected from SMEs by its market research department. This system provides SMEs with benefits such as the reduction of indirect costs related to the supply

and price stability for materials, thanks to an adjustment of the procurement period to minimize the influence of fluctuations in the international market prices.

Source: PPS web page

(b) Strengthening the manufacturing skills of targeted enterprises including subcontractors

It is important that training on the basic technologies necessary for machine manufacture (especially turning, milling and welding) is provided to the targeted enterprises and their subcontractors, in order to improve their technological level. These training sessions must be combined with training to improve the understanding of drawings, since the skill to read drawings is a precondition for ensuring effectiveness of the training.

These training courses are to be carried out by I2T according to its mission. For these training sessions employees of I2T can be used who have obtained through this Project the capacity to deliver training. Since primary or secondary processing machines (fruit collecting, dissecting or cutting) and their parts do not have a complex function/shape, manufacturing them does not require complex machines such as numerically controlled machines. The training carried out under the pilot project of this Project covers the basic types and levels of technologies. However, it will be necessary to strengthen the theory part of these courses in collaboration with vocational school teachers who are competent in this field, because the theory level of I2T trainers is not high enough compared to their practical level. As for training to improve the comprehension of drawings, it will be necessary to train the trainers first before new training can be carried out.

The types of techniques currently used by the targeted enterprises are turning, milling and welding. These techniques are limited and do not allow enterprises to manufacture machines in a consistent and efficient way. It will therefore be necessary to introduce to I2T machines[38] that enable efficient manufacture of machines using technologies that are not yet available in Côte d'Ivoire. These machines will enable I2T to provide SMIs not only with training on new technologies and maintenance methodology, but also in machining services. However, these services must be offered at appropriate prices to facilitate dissemination of these technologies to private enterprises.

(c) Technical training (training of engineers and technicians)

In order to improve the technological level of Ivorian enterprises, it is essential to train, at institutions of higher education and training centers, human resources who have basic knowledge and experience. However as discussed in Chapter 3, these institutions struggle to provide learners with the education

[38] Introduction of a punch press can be envisaged. Even if stamping technology is not introduced at all in Côte d'Ivoire, there is a high need and priority for introducing a technology that allows production of products in quantity in an efficient manner and with consistent quality, in order to be able to access the quality market. This technology can meet the current needs of targeted enterprises by manufacturing to order, the production of various types of parts in small quantities, the production of average or individual quantities using multi-purpose machines such as a turret cutting press.

required due to the obsolete machines and inadequate practical courses.

Implementation of the market analysis and strengthening of design and manufacturing skills proposed in this policy will enable MIM to obtain information on the levels and types of technologies, as well as the current skill levels of design engineers and enterprise technicians.

Analysis of this information will allow MIM to communicate with the relevant training institutions so that their training programmes (level and content) are better suited to the needs of industries, helping them to comply with this policy.

(2) Strengthening management skills

To strengthen enterprises' competitiveness, it is essential to provide them with the skills to define realistic objectives and to invest the necessary resources in a timely manner. These skills consist not only of technologies (human resources and machinery) but also of the skills to mobilize and control funds and materials, collect market information and develop a growth strategy.

To acehive this, this policy aims to improve the targeted enterprises' management knowledge, enabling them to better take advantage of the opportunities that MIM can provide in implementation of the policy, such as access to market information, training to improve their technological level and meetings with financial institutions.

Enterprises that want to operate on the quality market need to improve their productivity and the quality of their products in order to meet the needs of the quality market. It is therefore desirable to present and train Ivorian enterprises in the Kaizen (continuous improvement) method, started in Japan and now applied to production sites all over the world. Since this method is not well known in Côte d'Ivoire, it would be necessary to begin by sensitizing the targeted SMIs to the basic principles of the Kaizen method.

4-5-3 Improving the environment in which targeted SMIs develop

(1) Supporting promotion of products from the targeted SMIs

The aim of this policy is to increase the added value of the products from Ivorian enterprises to enable them to meet the requirements of the quality market. To achieve this goal, enterprises must be able to develop products satisfying the QCD and provide them to customers.

In Côte d'Ivoire, the CDT is already involved in promoting technologies (machines), as mentioned in Chapter 3. It is therefore desirable for the CDT to expand its services by organizing trade shows and promoting enterprises and their products by means of brochures or websites, etc., linking sellers and buyers.

(2) Support for access to credit

To improve the targeted SMIs' access to credit, the Ivorian government will have to continue its support by means of credit guarantee schemes and training courses on management through programmes such as the Phoenix Programme. Even though these systems and mechanisms have been established, enterprises will not be able to benefit from credit if they do not know how to use it.

In fact, there is an asymmetry of information between banking institutions and SMEs with unreliability of information. The asymmetry of information is a reason why enterprises that in principle have repayment capacity are not able to benefit from loans.[39] The lack of trust that results from this raises a fundamental problem in the credit system for SMEs in Côte d'Ivoire. Ivorian banks or enterprises are rather reluctant to provide information, which prevents banks from knowing the characteristics of the targeted enterprises and providing the services desired.

In addition, while the exchange of information and development of trust between these two players are not direct solutions to the problems of inadequacy of guarantees or of enterprises' accounting ability, they can however highlight the exact problems they face and the skills they lack. Management training should be developed for this purpose.

The guarantee system could contribute to resolving the problem of information asymmetry between banking institutions and SMEs.[40] However, merely introducing this guarantee system is not enough to solve this problem of information asymmetry. In many cases, a government-initiated guarantee system does not require the guarantor to collect and evaluate information about the borrower. This system does not solve the problem of information asymmetry,[41] but can rather deepen it (problem of principal-agent) by reducing the incentives for banking institutions to adequately assess the repayment capacity of the borrower.[42] So it could be said that the guarantee system cannot just fill the gap. Thus, promotion of credit for SMEs must be carried out in conjunction with accompanying measures such as training.[43]

In addition to the MCAPPME initiative such as establishing guarantee systems, the CDT can conduct activities of awareness-raising, intermediation and reconciliation to bridge the gaps in information between targeted enterprises and banking institutions. If the CDT acquires reliable information about the targeted enterprises and the operating mechanism for credit, it can reduce the problem of information asymmetry by linking the targeted enterprises with banks that have services well suited to their needs.

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[39] Warwick. 2016. Public Credit Guarantees and Access to Finance

[40] OECD. 2013. Facilitating Access to Finance: Discussion Paper on Credit Guarantee Schemes; Naoyuki Yoshino, 2015. SME Finance and Credit Rating of SMEs; OECD. 2013. SME and Entrepreneurship Financing: The Role of Credit Guarantee Schemes and Mutual Guarantee Societies in supporting finance for small and medium-sized enterprises

[41] Warwick. 2016. Public Credit Guarantees and Access to Finance

[42] Vogel, R. C. and D.W. Adams, 1997. Costs and Benefits of Loan Guarantee Programs. The Financier – Analyses of Capital and Money Market Transactions 4, 22-29

[43] OECD. 2015. New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments; Loan guarantee funds IFAD

The CDT can summarize the reasons and opportunities for which the targeted enterprises need banking services and those for which the banking institutions cannot respond, and present the result to MIM so that the latter can submit it to the Ministry of Economy and Finance.

The CDT can also ask banking institutions to develop services that are more responsive to business needs. For example, banks should, in principle, develop a credit risk assessment methodology and risk mitigation measures based on the characteristics of the targeted industry.[44] They can thus have an overall idea of the types of activity, the target market, the properties and risks of the enterprises targeted on the basis of the information provided by the CDT, which will be used to determine the conditions of loans.

It is possible in the long term for MIM to establish a mutual bank or mutual guarantee system by better organizing targeted SMEs. There are examples in Cameroon (FONDECAMPME) and Italy (CONFIDI) (see the box "Example of resolution of information asymmetry between banking institutions and enterprises").

However, it is difficult at the moment to create such an association in Côte d'Ivoire since: (i) the linkages between the targeted enterprises hardly exist as each enterprise operates in an isolated manner; and (ii) the size of the targeted sector that could benefit from credit is small.

One of the prerequisites for creating a mutual bank or a mutual guarantee system is the increase of trust between the targeted enterprises and MIM (and the bodies under its supervision), which enables establishment of an association of targeted enterprises.

Example of resolution of information asymmetry between banking institutions and enterprises

The importance of transparency of information between banking institutions and SMEs is reflected in the advantages of the mutual guarantee system (MGS). In order to develop the basis for promoting access to credit, the MGS was created and managed under the initiative of local enterprises (unlike the credit promotion initiated by the government).[45] The guarantor itself being part of the supply chain in the local economy with knowledge about the enterprises, the sector and their potential for development, the MGS itself can solve the problem of information asymmetry between banks and SMEs. In addition, by having a close relationship with SMEs, the MGS can collect and offer credit and guarantee information to SMEs and assist in preparing accounting documents.

The CONFIDI in Italy is a well-known example of a MGS with about 1 million member enterprises (Italy is one of the countries with the largest contribution of small enterprises to the economy in the

[44] For example, in order to grant loans based on movable assets (loans whose collateral is based on accounts receivable, inventories, machinery, facilities, etc.), banking institutions must obtain information on each industry since each industry has different characteristics and types of movable assets. OECD. 2015. New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments; Loan guarantee funds IFAD

[45] OCDE. 2012. SME and Entrepreneurship Financing: The Role of Credit Guarantee Schemes and Mutual Guarantee Societies in supporting finance for small and medium-sized enterprises

EU area). It should be said that one of the advantages of the MGS that contributes to promoting credit to SMEs is its role as a facilitator for exchanging information.

Moreover, promoting the exchange of information between banking institutions and SMEs over the internet is also effective. The Korean Credit Guarantee Fund (KODIT) started a project on the online credit market in 2010 involving activities promoting the exchange of information between lenders and borrowers. As a result, borrowers can choose the most appropriate financial service for their conditions.[46] The cost of marketing for the banking institutions can be dramatically reduced by seeking new customers through websites. There are therefore measures to solve the problem of information asymmetry using computer tools such as the internet.

Source: OCDE, Japan Finance Corporation (JFC)

(3) Promotion of access to industrial land

Although the decree obliges industrial enterprises to establish themselves in an industrial area, enterprises often do not know this obligation or they are not in a position to have the information on the procedures even if they know about the obligation.

The government is in the process of developing an industrial area. It is necessary for the Industrial Infrastructure Management and Development Agency (AGEDI), established under the auspices of MIM, to sensitize enterprises on the obligation and procedures, and to provide enterprises with support for acquiring land in an industrial area.

(4) Promotion of product price competitiveness

In the quality market targeted in this policy, locally manufactured machines are forced to compete with imported ones. Locally manufactured machines are not competitive in terms of price because the price of imported materials is high due to high tariffs. It is therefore necessary for MIM to work for the adoption of a system of exemption from import duties for materials used in machinery manufacture or parts intended for the agro-industrial sector.

[46] KODIT. 2010. Kodit Annual Report 2010

Chapter 5 Action Plans

5-1 Strengthening governance of the targeted sector

5-1-1 Increasing the availability of data and statistics on the targeted sector

(1) Objective

Have up-to-date data and statistics on the targeted sector.

(2)-1 Organization responsible

MIM

(2)-2 Organizations involved

CDT, INS, BSTP and CCICI

(3) Organization responsible

MIM

(4) Activities

(a) Carry out a monographic study of enterprises in the targeted sector (number of enterprises, size of enterprises, turnover, number of employees, products, machines available, customers, etc.).

(b) Carry out a market study of quality agricultural/agro-processing machinery and spare parts (assessment of national/subregional demand, types of machines, potential customers, etc.).

(c) Create a database of enterprises in the sector.

(d) Regularly update (once a year) data and statistics (collaboration with CDT, INS, BSTP, CCICI, etc., visits to the enterprises).

(5) Indicator

Updated database on enterprises in the sector available

(6) Budget

Total for 5 years: 100 million CFAF

- Monographic study of enterprises in the targeted sector: 50 million CFAF
- Market study: 25 million CFAF
- Updating data and statistics: 25 million CFAF

5-1-2 Supporting development of relationships between the targeted enterprises as well as between the enterprises and public bodies

(1) Objective

Promote partnership and business relations by enterprises in the sector.

(2) Organizations responsible

MIM (management), CDT and BSTP (implementation of activities)

(3) Activities

(a) Identify all programs, projects, public tenders in progress that offer business development opportunities to enterprises in the sector.
(b) Organize information and awareness-raising meetings for enterprises in the sector on the results of studies (5-1-1), programmes, projects, public tenders in progress, etc. (twice a year).
(c) Raise awareness among enterprises in the sector about the creation of an association (college).

(4) Indicators

Meeting minutes, Association created and functional

(5) Budget

Total for 5 years: 50 million CFAF

- Costs of meetings: 5 million CFAF * 2 times/year

5-2 Strengthening the technological and managerial skills of enterprises

5-2-1 Strengthen design skills

(1) Objective

Have 6 enterprises able to design equipment and mass production.

(2)-1 Organization responsible

MIM and I2T

(2)-2 Organizations involved

Universities and INPHB

(3) Activities

(a) Recruit an international expert in agro-industrial machinery design and an international expert in production technology.

(b) Select the agro-industrial machinery to be designed under the supervision of the experts based on the results of the market study (5-1-1 (3) b).

(c) Select enterprises with a basic design capability.

(d) Develop and sign a partnership agreement between the implementation bodies (MIM, I2T, universities, enterprises).

(e) Develop a machine development schedule.

(f) Involve student engineers and technicians in the machine development project.

(g) Carry out development of the machine, following the schedule.

(h) Organize training on the knowledge of metal materials (types, characteristics, tools and the method for machining each material).

(i) Evaluate the project.

* Place for implementation of activities: one of the conditions for the effective performance of the project is the ease of participation. Located in the suburbs of Abidjan, the I2T premises have problems with access, with its obsolete and limited types of equipment. In addition, I2T does not have the human resources capable of giving advice on a daily basis (other than the foreign expert placed at its disposal), despite the presence of technicians experienced in machining. As a result, the INPHB, which has competent advisers and has easier access, is recommended as a place to hold these activities.

(4) Indicators

Drawings for mass production conforming to the international standard, number of participating enterprises

(5) Budget

Total for 5 years: 996 million CFAF

- Expert: 72 million CFAF/year * 5 years * 2 persons = 720 million CFAF
- Cost of manufacturing prototypes: 50 million CFAF/prototype * 3 prototypes = 150 million CFAF (manufacturing 3 prototypes is envisaged during this project with one prototype in 2 years and the third with the experience gained in the absence of the expert to be recruited)
- Remuneration for the students: (200,000 CFAF/month * 24 months * 6 persons) + (200,000 CFAF * 12 months * 3 persons) = 36 million CFAF
- Other costs for development project activities (market research, reverse engineering, field tests, etc.):30 million CFAF/prototype * 3 prototypes = 90 million CFAF

5-2-2 Strengthen manufacturing skills

(1) Objective

Have a set of enterprises capable of making quality parts.

(2)-1 Organization responsible

MIM and I2T

(2)-2 Organizations involved

IPNETP, Technical Centers (strengthening theoretical training) and FDFP (Financing)

(3) Activities

(a) Organize training on welding, milling and turning technologies.

(b) Introduce technologies that improve the productivity of the parts manufacturing enterprises but are not yet sufficiently well known in CI.

* The first technology is stamping technology (technology for manufacturing mechanical parts by forging).

(c) Organize demonstrations of new technologies.

(d) Introduce machines for quality control of products.

(e) Provide services with the new machines and the quality control machines.

(4) Indicators

Number of enterprises participating in training, number of participants

(5) Budget

Total for 5 years: 450 million CFAF

- Training: 50 million CFAF
- NC press brake: 100 million CFAF; Stamping machines: 250 million CFAF
- Quality control machines: 50 million CFAF

5-2-3 Support vocational and technical training (training of engineers and technicians)

(1) Objective

Inform the ministries responsible of the needs of strengthening vocational and technical training.

(2)-1 Organization responsible

MIM

(2)-2 Organizations involved

Ministries responsible for higher education and vocational and technical training

(3) Activities

(a) Evaluate the design level made by the engineers and the manufacturing performed by the technicians.

(b) Identify the need to strengthen training of design engineers and manufacturing technicians.

(c) Organize discussion meetings between the ministries responsible for higher education and vocational and technical training and the international experts recruited, in order to submit to them the needs for strengthening the training. It is recommended to obtain the participation of universities, colleges and vocational and technical training centers in the meetings to broaden the discussions.

(4) Indicator

Report on the technological level of engineers and technicians, number of meetings between ministries responsible and the international experts.

(5) Budget

Total for 5 years: 10 million CFAF

- Costs of meetings: 1 million CFAF/meeting * 10 times

5-2-4 Strengthen management capacity (financial, human resources, procurement, marketing, development plan, etc.)

(1) Objective

Improve the management capabilities of the targeted enterprises.

(2)-1 Organization responsible

MIM and CDT

(2)-2 Organizations involved

MCAPPME, BSTP and CCICI

(2) Activities

(a) Organize the DGAInostic assessment of SME management capacities. *The study will be carried out by a firm that has the expertise to DGAInose business management capabilities.

(b) Select the training firms or courses offered by the MCAPPME, the BSTP or the CCICI, on the topics selected after DGAInosis.

(c) Organize the training sessions.

(d) Evaluate the training sessions.

(3) Program to be solicited

PRNMN, Phoenix Programme

(4) Indicators

Number of enterprises participating in training

(5) Budget

Total for 5 years: 135 million CFAF

- Costs of the study: 60 million CFAF
- Training costs: 70 million CFAF.
- Assessment of Training: 5 million CFAF

5-2-5 Introduce the KAIZEN method

(1) Objective

Improve the productivity and quality of the products and services of the targeted enterprises.

(2) -1. Organizations responsible

MIM and CODINORM (Côte d'Ivoire Standardization)

(2) -2. Organizations involved

BSTP and FDFP

(3) Activities

(a) Invite a KAIZEN expert once a year.
(b) Train the human resources of CODINORM on the KAIZEN method to make it an organization for dissemination.
(c) Organize training seminars for enterprises on the KAIZEN method (theory and practice).
(d) Select and train 10 enterprises (2 enterprises per year) among the enterprises trained to implement the KAIZEN method in the field.
(e) Monitor and assess productivity and quality improvements in the enterprises trained.

(4) Indicator

Number of CODINORM staff trained, number of enterprises participating in training seminars

(5) Budget

Total for 5 years: 260 million CFAF

- Expert (6 weeks): 25 million CFAF / year
- Costs of training seminars: 10 million CFAF / year
- Training costs for the selected enterprises: 15 million CFAF / year
- Monitoring and evaluation: 2 million CFAF / year

5-3 Improve the environment of the targeted sector

5-3-1 Supporting promotion of products from the targeted SMIs

(1) Objective

Increase the sales volume of the targeted enterprises.

(2) -1. Organizations responsible

MIM and CDT

(2) -2. Organization involved

BSTP

(3) Activities

(a) Organize a promotional trade show of the targeted enterprises' products every two years.
(b) Develop promotional materials (catalogue, website, review, etc.) of targeted products and enterprises.
(c) Support establishment of a consortium of targeted enterprises for calls for tenders.
(d) Facilitate (information, support, etc.) participation of targeted enterprises at trade fairs, shows, events, nationally and subregionally.

(4) Program to be solicited

National export strategy and Support Program for Trade and Regional Integration (Programme d'Appui au Commerce et à l'Intégration Régionale: PACIR) UNIDO

(5) Indicator

Number of enterprises whose sales volume is increasing.

(6) Budget

Total for 5 years: 260 million CFAF

- Costs of a promotional show: 100 million CFAF * 2 times = 200 million CFAF.
- Development of promotional materials: 20 million CFAF * 2 times = 40 million CFAF
- Setting up a consortium (recruiting a firm): 20 million CFAF

5-3-2 Promotion of access to financing

(1) Objective

Increase the number of enterprises that receive loans from financial institutions.

(2) -1. Organizations responsible

MIM and CDT

(2) -2. Organization involved

MCAPPME

(3) Activities

(a) Collect information on financing mechanisms of each financial institution (financial products, conditions, procedures, etc.) and the institutional support set up by the state.
(b) Create a database on the information collected.
(c) Organize meetings for discussion between the targeted enterprises, the financial institutions (banks and microfinance) and the state's support bodies.
(d) Organize training workshops on assembling a loan application file

(4) Program to be solicited

PRNMN and Phoenix Programme

(5) Indicators

Database developed, number of training sessions organized, number of enterprises submitting a file

(6) Budget

Total for 5 years: 90 million CFAF

- Gathering information: 3 million CFAF * 5 times = 15 million CFAF
- Costs of meetings: 5 million CFAF/meeting * 10 times = 50 million CFAF
- Workshop Costs: 5 million CFAF * 5 times = 25 million CFAF

5-3-3 Promotion of access to industrial land[47]

(1) Objective

Increase the number of enterprises that move their premises to industrial land.

(2) Organizations responsible

MIM and Agency for Management and Development of Industrial Infrastructure (Agence de Gestion et de Développement des Infrastructures Industrielles: AGEDI)

(3) Activities

(a) Organize discussion meetings between the targeted enterprises and AGEDI on the procedures for acquiring industrial land.

(b) Raise awareness of the targeted enterprises to location in industrial spaces dedicated to SMEs.

(4) Indicators

Number of enterprises that submit a file.

(5) Budget

Total for 5 years: 5 million CFAF

- Costs of meetings: 1 million CFAF * 5 times = 5 million CFAF

5-3-4 Promotion of locally manufactured product price competitiveness (machinery and spare parts)

(1) Objective

Improve the price competitiveness of the products of the targeted enterprises.

(2) Organization responsible

MIM

(3) Activities

Develop and adopt a regulation for import tax exemption on materials for manufacturing machinery and agro-industrial parts.

(4) Indicator

Import tax exemption regulation adopted

[47] As long as the industrial land is laid out as planned.

(5) Budget

A specific budget is not required because this activity can be carried out in the ordinary work of MIM.

Table 11 Summary table of actions

Objective: Develop a set of SMIs in the targeted sector that can manufacture high quality and highly competitive machines and parts

Target period: 5 years

Axes	Actions	Objectives	Indicators	Budgets (total for 5 years)	(1) Organizations responsible and (2) Organizations involved
Strengthening governance of the targeted sector	Increasing the availability of data and statistics on the targeted sector	Have up-to-date data and statistics on the targeted sector	• Updated database on enterprises in the sector available	100 million CFAF	(1) MIM
	Support development of relationships between the targeted enterprises as well as between the enterprises and the public bodies	Promote partnership and business relations by enterprises in the sector.	• Records of meetings • Association created and functional	50 million CFAF	(1) MIM (management) (2) CDT and BSTP (implemented)
Strengthen the technological and managerial skills of enterprises	Strengthen design skills	Have 6 enterprises able to design equipment and mass production	• Drawings for mass production conforming to the international standard • Number of enterprises participating	996 million CFAF	(1) MIM and I2T (2) UFHB and INPHB
	Strengthen manufacturing skills	Have a set of enterprises capable of making quality parts.	• Number of enterprises participating in training • Number of participants	350 million CFAF	(1) MIM and I2T (2) IPNETP, Technical Centers and PFLP
	Support vocational and technical training (training of engineers and technicians)	Inform the ministries responsible of the needs of strengthening vocational and technical training.	• Report on the technological level of engineers and technicians • Number of meetings between ministries responsible and the international experts.	10 million CFAF	(1) MIM (2) MESRS and MENETFP
	Strengthen management capacity	Improve the management capabilities of the targeted enterprises.	• Number of enterprises participating in training	135 million CFAF	(1) MIM and CDT (2) MCAPPME, BSTP and CCICI

	Introduce the KAIZEN method	Improve the productivity and quality of the products and services of the targeted enterprises.	• Number of CODINORM staff trained • Number of enterprises participating in training seminars	260 million CFAF	(1) MIM and CODINORM (2) BSTP and FDFP
Improve the environment of the targeted sector	Support promotion of products from the targeted SMIs	Increase the sales volume of the targeted enterprises.	Number of enterprises whose sales volume is increasing	260 million CFAF	(1) MIM and CDT (2) BSTP
	Promotion of access to financing	Increase the number of enterprises that receive loans from financial institutions	• Database developed, number of training sessions organized • Number of enterprises submitting a file	90 million CFAF	(1) MIM and CDT (2) MCAPPME
	Promotion of access to industrial land	Increase the number of enterprises that move their premises to industrial land	• Number of enterprises that submit a file	5 million CFAF	(1) MIM and AGEDI
	Promote price competitiveness of locally manufactured products (machinery and spare parts)	Improve the price competitiveness of the products of the targeted enterprises.	• Import tax exemption regulation adopted	A specific budget is not required	(1) MIM