

**<JICA DEVELOPMENT STUDY>**

**THE STUDY  
ON  
THE MASTER PLAN FOR  
QUALITY/PRODUCTIVITY IMPROVEMENT  
IN  
THE REPUBLIC OF TUNISIA**

**FINAL REPORT  
(SUMMARY)**

**JULY 2008**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**JAPAN DEVELOPMENT SERVICE CO., LTD.**

<b>IL</b>
<b>JR</b>
<b>08-013</b>

## ABBREVIATIONS

Abbreviations	English	French
AFD	-----	Groupe Agence Française de Développement
AfDB	African Development Bank	Banque Africaine de Développement
ANBEIC	-----	Association Nationale des Bureaux d'Etudes et des Ingénieurs Conseil
AP	Action Plan	Plan d'Action
API	-----	Agence de Promotion de l'Industrie
BFPME	-----	Banque de Financement des Petites et Moyennes Entreprises
CC	Coordination Committee	Comité de Coordination
CETIME	-----	Centre Technique des Industries Mécaniques et Electriques
CEPEX	-----	Centre pour la Promotion des Exportations
CETIBA	-----	Centre Technique de l'Industrie du Bois et de l'Ameublement
CETTEX	-----	Centre Technique du Textile
CNCC	-----	Centre National du Cuir et de la Chaussure
C/P	Counterpart	Homologue
CTAA		Centre Technique de l'Agroalimentaire
CTC	-----	Centre Technique de la Chimie
CTMCCV	-----	Centre Technique des Matériaux de Construction, de la Céramique et du Verre
DFID	UK Department for International Development	-----
EU	European Union	Union Européenne
FAMEX	Export Markets Access Fund	Fonds d'Accès aux Marchés d'Exportation
FEDELEC	-----	Fédération Nationale de l'Electricité et de l'Electronique
FEDEX	-----	Fédération de l'Exportation
FIPA	Foreign Investment Promotion Agency (FIPA)	Agence de Promotion de l'Investissement Extérieur
FODEC	-----	Fonds de Développement de la Compétitivité
GTZ	German Agency for Technical Cooperation	Agence Allemande de Coopération Technique
HACCP	Hazard Analysis - Critical Control Point	-----
IC/R	Inception Report	Rapport Initial
INORPI	-----	Institut National de la Standardisation et de la Propriété Industrielle
INSAT	-----	Institut National des Sciences Appliquées et de Technologie
ISO	International Organization for Standardization	-----

<b>Abbreviations</b>	<b>English</b>	<b>French</b>
JBIC	Japan Bank for International Cooperation	Banque Japonaise de Coopération Internationale
JICA	Japan International Cooperation Agency	Agence Japonaise de Coopération Internationale
KAIZEN	KAIZEN	KAIZEN (Amélioration continue)
MA	Master Plan	Plan Directeur (PD)
MDCI	Ministry of Development and International Cooperation	Ministère du Développement et de la Coopération Internationale
MIEPME	Ministry of Industry, Energy and SME	Ministère de l'Industrie, de l'Énergie et des PME
M/M	Minutes of Meeting	Procès-verbal de la réunion
ONUDI (UNIDO)	United Nations Industrial Development Organization	Organisation des Nations Unies pour le Développement Industriel
OTCE	-----	Office Technique de Coopération Espagnole
PACTEC	-----	Centre Technique de l'Emballage et du Conditionnement
PDM	Project Design Matrix (PDM)	-----
PMN	-----	Programme de Mise à Niveau
PMI	-----	Programme de Modernisation Industrielle
PNUD (UNDP)	United Nations Development Program	Programme des Nations Unies pour le Développement
PP	Pilot Project	Projet-pilote
QC	Quality Control Circle	Cercle de Qualité
QCD	Quality/Cost/Delivery	-----
SOTUGAR	-----	Société Tunisienne de Garantie
S/W	Scope of Works	-----
TC	Technical Center	Centre Technique
TPM	Total Productive Maintenance	-----
TQC	Total Quality Control	-----
TQM	Total Quality Management	-----
TUMAC	Tunisian Accreditation Council	Centre National d'Accréditation (CNA)
UGPQ	-----	Unité de Gestion du Programme National de Promotion de la Qualité
UNDP (PNUD)	United Nations Development Program	Programme des Nations Unies pour le Développement
UNIDO (ONUDI)	United Nations Industrial Development Organization	Organisation des Nations Unies pour le Développement Industriel
UTICA	-----	Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat
W/S	Workshop	Atelier de travail
5S	5S	5S
7S	7S	7S

# CONTENTS

1. Background of the Study.....	1
2. Objectives of the Study .....	1
3. Outline of the Study .....	2
4. Study Implementation Policy.....	4
4.1 Thorough Enforcement of Practical Transfer of Technology.....	4
4.2 Approach from the Viewpoint of Industrial Policy.....	4
4.3 Utilization of Japan's Experience and Knowledge .....	4
4.4 Utilization of Existing Machinery and Equipment .....	5
4.5 Utilization of Existing Information and Materials.....	5
4.6 Compatibility with Similar and Related Projects by other Donors.....	5
5. Implementation Contents of the Study.....	6
5.1 Preparatory Work in Japan (July 2006 ~ September 2006).....	6
5.1.1 Collection, Screening and Analysis of Related Information .....	6
5.2 First Field Survey (September 2006 ~ November 2006).....	6
5.2.1 Survey of Current Conditions (Government and Industrial Agencies).....	6
5.2.2 Visit Surveys and Analysis of Current Conditions and Issues in Companies .....	7
5.2.3 Staging of the Quality and Productivity Improvement Seminar and Workshops.....	11
5.2.4 Setting of the Pilot Project Target Companies Selection Criteria .....	13
5.2.5 Selection of Pilot Project Target Companies.....	13
5.3 First Work in Japan (November 2006 ~ January 2007) .....	15
5.3.1 Compilation of the Pilot Project Implementation Plan .....	15
5.3.2 Preparation of the Quality/Productivity Improvement Manuals (Draft).....	15
5.4 Second Field Survey (January 2007~March 2007).....	15
5.4.1 Discussion and Compilation of the Pilot Project Implementation Plan .....	15
5.4.2 Sharing and Correction of the Quality/Productivity Improvement Manuals .....	18
5.4.3 Preparation of the Implementation Plan Concerning Company Diagnosis and Proposal Compilation.....	18
5.4.4 Compilation of Proposals for the Target Companies and Monitoring and Evaluation of the Condition of Implementation of Proposals.....	22
5.5 Second Work in Japan (March 2007 ~May 2007.) .....	23
5.5.1 Preparation of Progress Report .....	23
5.6 Third Field Survey (May 2007 ~ July 2007.) .....	23
5.6-1 Compilation of Proposals for Target Companies and Monitoring and Evaluation of Implementation Conditions .....	23
5.7 Third Work in Japan (July 2007 ~ September 2007.) .....	23
5.7.1 Training in Japan.....	23

5.8	Fourth Field Survey (September 2007 ~Middle of October 2007)	27
5.8.1	Compilation of Proposals for Three Target Companies and Monitoring and Evaluation of the Condition of Implementation of Proposals	27
5.8.2	Completion of the Quality/Productivity Manual	27
5.8.3	Closing Ceremony	27
5.9	Fourth Field Survey (October 2007 ~December 2007)	27
5.9.1	Preparation of the Master Plan for Quality / Productivity Improvement (Draft)	27
5.9.2	Preparation of the Dissemination Seminar Implementation Plan (Draft) and Staging of the Dissemination Seminar	27
5.10	Third Work In Japan (January 2008 ~March 2008)	30
5.10.1	Preparation of Draft Final Report	30
5.11	Fifth Field Survey	30
5.11.1	Explanation of DF/R	30
5.12	Fourth Work in Japan	30
5.12.1	Compilation of the Final Report	30
6.	Results of the Study	30
7.	Issues and Recommendations for Improvement of Quality/Productivity	31
7.1	Outline of the Pilot Project and Assumptions in Implementation	32
7.1.1	Outline of the Pilot Project	32
7.1.2	Setting of Assumptions in PP Implementation	33
7.1.3	JICA Project Approach (Comparison with EU Project)	33
7.2	Verification of the PP Outcomes and Assumptions	34
7.2.1	Assumption 1	34
7.2.2	Assumption 2	35
7.2.3	Assumption 3	38
7.2.4	Assumption 4	40
7.3	Issues Confronting Quality/Productivity Improvement	42
7.3.1	Reinforcement of International Competitiveness in Component Quality and Design Quality (How to Enhance Total Quality)	44
7.3.2	How to Widely Disseminate Technologies (Techniques) for Quality / Productivity Improvement	44
7.3.3	How to Enhance the Awareness of Top Management (and Middle Managers)	45
7.3.4	How to Build a Setup (Organizations and Systems) for Promoting Dissemination Activities in All Sectors	46
7.4	Recommendations for Quality/Productivity Improvement	47
7.4.1	Recommendations for Reinforcing Total Quality Capacity	47
7.4.2	Continuation of Kaizen Activities and Implementation of the Trainers' Training (TT) Program (development of technical dissemination leaders)	51

7.4.3	Implementation of Training Programs for Top Management (training for the technology receiving side).....	57
7.4.4	Building of the Dissemination Activities Promotion Setup (organization or system).....	59

[Appendices]

A-1	Minutes of Discussions (S/W) (M/D) .....	A-1
A-2	List of Visited Company (All Sector) .....	A-11
A-3	Evaluation List of Visited Companies .....	A-13
A-4	Seminar Program 2006 .....	A-17
A-5	Invitation Card (Seminar 2006) .....	A-18
A-6	Seminar Photographs (2006).....	A-19
A-7	Article on the Seminar (La Press de Tunis) .....	A-20
A-8	Distribution Map of Model Companies for Pilot Project.....	A-21
A-9	List of PP Implementation Contents and Outputs.....	A-22
A-10	Seminar Program (2007).....	A-24
A-11	Invitation Card (Seminar 2007) .....	A-25
A-12	Seminar Photographs (2007).....	A-26
A-13	Minutes of Meeting (Signed on May 5, 2008) .....	A-27
A-14	Study Team Members .....	A-32

## LIST OF FIGURES

Figure 7-1	Linkage of Each Phase.....	32
Figure 7-2	Interrelationship of the 4 Issues to be Tackled.....	43
Figure 7-3	Quality/Productivity Improvement Dissemination Activities based on Trainers' Training.....	54
Figure 7-4	Establishment of Organization for Promoting Quality/Productivity Improvement Activities (2012-).....	62

## LIST OF TABLES

Table 3-1	Activities Under the “Master Plan Study for Quality and Productivity Improvement in the Republic of Tunisia” .....	3
Table 5-1	Selection Criteria for Model Companies for the Pilot Project .....	13
Table 5-2	List of Selected Model Companies for Pilot Project .....	14
Table 5-3	Pilot Project Implementation Plans for Each Company.....	19
Table 5-4	Tentative Schedule of Pilot Project and Work Description.....	21
Table 5-5	Evaluation items of Pilot Project .....	22
Table 5-6	Training Program.....	24
Table 5-7	Syllabus.....	25
Table 7-1	Improvement Techniques deemed to be Effective for Quality/Productivity Improvement in the Tunisian Manufacturing Industry .....	36
Table 7-2	Relatively Common Problems and Valid Kaizen Techniques in Food Processing Enterprises.....	37
Table 7-3	Improvement Technologies that the Counterparts have Acquired and Can Use in Future .....	38
Table 7-4	Kaizen Outputs in the Pilot Project.....	39
Table 7-5	Required Quality/Productivity Improvement Activities and Existing Implementing Agencies .....	42
Table 7-6	Recommendations for Reinforcing Total Quality Capacity.....	48
Table 7-7	Procedure of Quality/Productivity Improvement (Kaizen) Guidance .....	53
Table 7-8	Production Technologies to be Acquired for Future Quality/Productivity Improvement .	56
Table 7-9	Quality/productivity Improvement Dissemination Activities .....	56
Table 7-10	Implementation of Training Programs for Top Management .....	58
Table 7-11	New Organization Setup for Promoting Quality/Productivity Improvement Activities ...	63
Table 7-12	Quality/Productivity Improvement Promotion Setup .....	64

## **1. Background of the Study**

Following the conclusion of a partnership agreement with the European Union (EU), Tunisia will abolish its tariff barriers by 2008 and an inflow of high quality and inexpensive goods is expected to take place after the abolition of the tariff barriers. This prospect makes it essential for Tunisia to improve domestic industries which are protected under the current government policy and also to strengthen the international competitiveness of domestic products through productivity improvement activities and the extension of quality control techniques. The Industrial Improvement Programme (Mise a Niveau) has been promoted in Tunisia as a national programme since 1995 and the National Quality Programme Unit (UGPQ) was established in 2005 to deal with concrete pending issues.

The UGPQ is a temporary organization consisting of staff recommended by technical centres which are established in all industrial sectors as well as those from the Ministry of Industry, Energy and SMEs. Its principal aim is to enable 600 local companies by 2010 and ultimately 1,300 local companies to adopt international standards, including those of the International Organization for Standardisation (ISO). However, the UGPQ does not yet have in-depth knowledge or experience regarding quality/productivity improvement activities.

Against this background, the Government of Tunisia made a request to the Government of Japan to conduct a study with a view to formulating (i) a master plan incorporating the necessary policies and proposals for the implementation system for the extension of the quality/productivity improvement activities of the UGPQ and (ii) a relevant action plan. It was the hope of the Government of Tunisia that demonstrative company diagnosis and proposals for specified sub-sectors would be conducted in the course of the study and that human resources development involving CP personnel would form part of the study.

## **2. Objectives of the Study**

This development study aims at studying and analysing the electric industrial sector and the food processing sector, both of which are important industrial sectors in Tunisia, with a view to formulating a master plan which incorporates policies for quality/productivity improvement, a policy implementation system and an action plan, etc. In the course of the formulation of this master plan, various manuals relating to quality/productivity improvement will be prepared while taking the characteristics of Tunisian society and culture into consideration as these manuals will be essential for the implementation of the action plan. In addition, some local companies in these two sectors will be selected to check the practical effectiveness of these manuals. Furthermore, concrete advice on quality/productivity improvement will be provided during the pilot project with a view to verifying the effectiveness of these manuals as well as the practicality of the action plan. The expected outputs of the Study are listed below.



- (1) To classify the pending issues of the food processing and electric industrial sectors for quality/productivity improvement
- (2) To improve the quality/productivity of each model company by conducting the pilot project and to transfer techniques for quality/productivity improvement activities, such as the 5Ss, KAIZEN and Toyota production system, to the Tunisian side by means of jointly conducting a pilot project with staff of the UGPQ
- (3) To develop manuals, a master plan and an action plan for quality/productivity improvement to provide guidance for companies to improve their quality/productivity in a practical manner using the results of the pilot project.

### **3. Outline of the Study**

The Study is expected to last for 2 years (from August, 2006 until July, 2008) with three phases.

In Phase I (from August to November, 2006), a fact-finding survey was conducted, featuring the quality and productivity improvement efforts of companies, industrial associations and the government, etc. In particular, the fact-finding survey on companies featured 34 companies in the electrical and electronic sector, 30 companies in the food processing sector and 20 companies in other sectors.

In Phase II (from December, 2006 to October, 2007), 15 companies have been selected from among the target companies of the fact-finding survey in each of the electrical and electronic sector and food processing sector for the pilot project. The pilot project commenced in January, 2007 and is scheduled to finish in October.

In Phase III (from October, 2007 to July, 2008), a master plan describing, among other things, the creation of an extension system and an action plan for the nationwide promotion of quality and productivity improvement activities will be compiled based on the findings of the fact-finding survey in Phase I and those of the pilot project in Phase II.

Table 3-1 (Activities Under the “Master Plan Study for Quality and Productivity Improvement in the Republic of Tunisia”) shows the study activities by phase and by location of activity.

Table 3-1 Activities Under the “Master Plan Study for Quality and Productivity Improvement in the Republic of Tunisia”

	Field Work in Tunisia	Work in Japan
Phase I		< Preparatory Work in Japan: July to August, 2006 > ① Gathering, sorting and analysis of the relevant information and reference materials ② Confirmation of absent statistical data and conveyance of such absence to the Tunisian side ③ Preparation of the Inception Report (I/R)
	< First Field Survey: September to November, 2006 > ① Explanation of and discussions on the I/R ② Fact-finding survey on quality and productivity improvement activities in Tunisian industrial sectors in general, including the relevant legal system and policies, etc. (20 companies across various sectors) ③ Checking of the support system provided by the government and other organizations for the two target sectors (electrical and electronic sector and food processing sector) ④ Analysis of the present conditions of companies in the two target sectors (34 companies in the electrical and electronic sector and 30 companies in the food processing sector) ⑤ Holding of quality and productivity improvement seminars and workshops, etc. ⑥ Establishment of selection criteria for the model companies for the pilot project ⑦ Selection of model companies for the pilot project (34 companies in the electrical and electronic sector and 30 companies in the food processing sector)	
Phase II		< First Work in Japan: December, 2006 > ① Formulation of the draft pilot project implementation plan ② Compilation of the quality and productivity improvement manuals (draft)
	< Second Field Work: January to February, 2007 > ① Finalisation and establishment of a joint understanding of the pilot project implementation plan ② Establishment of a joint understanding of the quality and productivity improvement manuals (draft) ③ Preparation of proposals for the model companies; monitoring and evaluation of the implementation situation of the proposals	
		< Second Work in Japan: March to April, 2007 > ① Compilation of the Progress Report (P/R)
	< Third Field Survey: May to July, 2007 > ① Explanation of and discussions on the P/R ② Preparation of proposals for the model companies; monitoring and evaluation of the implementation situation of the proposals ③ Compilation of the quality and productivity improvement manuals	
		< Third Work in Japan: July to August, 2007 > ① Compilation of the Interim Report (I/R) ② Acceptance of trainees in Japan
Phase III	< Fourth Field Survey: September to October, 2007 > ① Continuation and completion of the pilot project ② Completion of the manuals	
	< Fourth Field Survey: October to December, 2007 > ① Formulation of the seminar implementation plan (draft) ② Holding of the seminars (at two locations for each of the two sectors)	
		< Fourth Work in Japan: January to April, 2008 > ① Compilation of the Draft Final Report (including the “Master Plan” and the “Action Plan”)
	< Fifth Field Survey: May, 2008 > ① Explanation of the Draft Final Report	
	< Fifth Work in Japan: June, 2008 > ① Compilation of the Final Report	

#### **4. Study Implementation Policy**

The study implementation policy is described over six headings in the Inception Report. Judging from the activities implemented in the first and second field surveys, it can be deemed that both were appropriate and valid in light of the implementation policy. The following paragraphs describe the review findings under each heading (policy).

##### **4.1 Thorough Enforcement of Practical Transfer of Technology**

Although few in number, there are some managers and executives in private companies who have knowledge of the 5S, kaizen, the kanban system and QCM, etc. However, cases of introducing such techniques into factories are extremely rare. Moreover, responsible officers in the counterparts (C/P) and related agencies have a certain degree of expert knowledge and have acquired techniques and methods concerning improvement of quality and productivity, however, they have not put these skills into practice in real situations. During implementation of the pilot projects (PP), model companies will be directly visited and corporate diagnoses and improvement proposals made, however, rather than making direct proposals to companies, a process of initially placing emphasis on transfer of technology to the C/Ps and enabling the C/Ps to make improvement proposals to each company has been thoroughly planned. Through acquiring knowledge, techniques and methods while utilizing the manual (draft), requiring the C/Ps to create daily diagnosis reports and conducting debate based on them, effort has been made to transfer the “method of thinking” and accumulate practical experience. Moreover, to ensure that knowledge, techniques and methods can be acquired in a theoretical system rather than as disparate elements, workshops will be staged at frequent intervals to promote understanding of each technique.

##### **4.2 Approach from the Viewpoint of Industrial Policy**

Seen from the viewpoint of strengthening the international competitiveness of industry, following the removal of tariff barriers with the EU in 2008, the state, industrial sector and individual companies realize that it is indispensable for approaches to be made from each level. However, there is little concrete evidence of the roles that should be played by each entity and the measures that connect each level. At the current time, the fact-finding survey and pilot project have confirmed that leaving quality/productivity improvement activities geared to reinforcing competitiveness to individual companies and industrial sectors (industrial groups) has its limits, and that government support, i.e. an approach based on industrial policy, is required.

##### **4.3 Utilization of Japan’s Experience and Knowledge**

Japanese production control technology and manufacturing know-how are considered relatively superior areas in world terms, and since the Tunisian side is strongly hoping for the transfer of Japanese manufacturing technology and techniques, it has actively examined the potential for

utilization. However, from the start of this project, work has been advanced based on the recognition that it is important to devise introduction methods that value the social and cultural climate and values in consideration of the current state of industry in Tunisia.

During the local meetings too, some voices raised the question, “Are Japanese technology, techniques and methods international?” Accordingly, the study team reaffirmed the essential need to be careful not to impose Japanese technology, techniques and methods, according to the originally intended policy.

#### **4.4 Utilization of Existing Machinery and Equipment**

Tunisia is currently promoting the renewal of plant equipment as part of the Program Mise a Niveau (PMN) industrial upgrading plan, which has been advanced by the Ministry of Industry, Energy and Small and Medium Enterprises since 1995. During the first field survey, there were some companies that had utilized such support in order to introduce new machinery and equipment, however, there were also confirmed to be numerous companies still utilizing old machinery and equipment. The pilot project in this study will be implemented in order to provide guidance on improving quality and productivity by making use of existing machinery and equipment. Concerning companies that need to promote quality/productivity improvement through introducing new machinery and equipment, advice regarding equipment renewal was included in the proposals and, as a new source of funding, the two-step loan scheme whereby the Japan Bank of International Cooperation (JBIC) offers finance for purchasing new machinery and equipment to small and medium enterprises (with employees of no more than 200) was introduced.

#### **4.5 Utilization of Existing Information and Materials**

In the first field survey, the level of use of reports and manuals from Japanese surveys implemented in the past was surveyed, and comments were gathered from local government officials. Moreover, during each field survey, effort was made to collect materials and information on aid programs and projects implemented by other donors especially the EU (the largest donor to the industrial sector in Tunisia) and to utilize these for reference purposes in the project.

#### **4.6 Compatibility with Similar and Related Projects by other Donors**

Upon conducting exchange of opinions with other donors in the field surveys, there was found to be no risk of this JICA development study overlapping with or countervailing activities by other donors.

In particular, the EU, which supports the Program Mise a Niveau (PMN) industrial upgrading plan, is conducting support activities for industrial promotion in the areas of coaching, quality improvement and business promotion. Whereas the EU approach to quality improvement focuses on guidance for

the acquisition of ISO certification, this JICA development study aims to improve quality and productivity for specific products; therefore, the intended targets are clearly different and both are in a complementary relationship. The study team and other donors alike realize the importance of conducting the close exchange of opinions and information to ensure that synergistic effects are created from these complementary relationships, and numerous donors, commencing with Germany, Italy and Spain, attended the seminar that was staged by JICA in October 2006.

## **5. Implementation Contents of the Study**

The main contents of activities in the study are described below.

### **Phase 1**

#### **5.1 Preparatory Work in Japan (July 2006 ~ September 2006)**

##### **5.1.1 Collection, Screening and Analysis of Related Information**

Related reports and materials including the report from the project formation study, materials and homepages prepared by government agencies, donors and private agencies, and other related materials were collected and sorted, and analysis was carried out regarding industrial policy, industrial structure, small and medium companies policy and the state of small and medium companies in Tunisia.

#### **5.2 First Field Survey (September 2006 ~ November 2006)**

##### **5.2.1 Survey of Current Conditions (Government and Industrial Agencies)**

###### **(1) Support by other Donors and Priority Sectors in Industrial Promotion**

The major donors in Tunisia (United Kingdom, France, Germany, Italy, Spain, United States, Canada, EU, UNDP, UNIDO, AfDB) were visited and information was collected regarding conditions of aid to Tunisia (aid policies, priority sectors and state of support to the industrial sector).

In particular, the approach of the largest donor, i.e. the EU, was compared to the approach in this project, and it was confirmed that the two approaches are mutually complimentary (see the Master Plan for details).

###### **(2) Confirmation of the Support Setup of Government Agencies and related Organizations, etc. in the Industrial Sector Overall**

Conditions of government agencies and private sector agencies involved in support for industry (support to promote entrepreneurship, technical centers working for quality improvement in existing companies, support for raising funds, etc.) were surveyed, in particular issues in the support setup (shortages of human resources in technical centers, inadequate guidance on

production lines, lack of business training opportunities for business owners, and so on) were confirmed.

## **5.2.2 Visit Surveys and Analysis of Current Conditions and Issues in Companies**

### **(1) Current Conditions and Issues in the Industrial Sector Overall**

Between September and October 2006, visits were made to 20 companies ranging from major corporations to minute enterprises covering all industrial sectors. (See Appendix A-2 List of Visited Companies (All Sectors)). Analysis of the current conditions and issues regarding improvement of quality and productivity are as described below.

#### **1) Current conditions**

The breakdown of visited companies according to sector is as follows: building materials - 2 companies, wood furniture - 5 companies, printing - 1 company, daily necessities - 1 company, leather processing - 3 companies, textiles and apparel - 2 companies, food-related - 1 company, metal processing - 2 companies, resin processing - 3 companies. In terms of capital, only 1 company is 100% foreign affiliated, 2 companies are 49% foreign affiliated, and the remaining 17 companies are based on Tunisian capital. In terms of the scope of management, just over 30% of the companies are restricted to wage-based processing and subcontracted production (companies specializing in production activities in the narrow sense), while over 60% conduct business management that includes marketing. However, the business stance towards liberalization is generally weak. Almost all the companies rely on imports for raw materials, except for 1 company that locally procures brick clay, 1 company that procures timber and 3 others that procure leather (1 of which also imports materials).

In terms of markets, 3 of the companies have an export ratio of 100%, 1 has 80%, 1 has 50%, 4 have between 10~15%, 2 have a few percentage points, and the remainder supply to the domestic market only. Products supplied to the domestic market are likely to be exposed more and more to competition with imported products in future. Companies will be faced with competition in terms of not only quality and price but also delivery, and a future issue will concern how to efficiently and economically conduct deliveries.

Moreover, concerning the building of ISO management systems, many companies have already acquired ISO9001 certification and are building systems based on this. However, approaches to improving quality and productivity following certification differ between each company.

## 2) Issues

Some companies such as brick makers and so on have poor productivity because safety measures are insufficient and numerous accidents occur. For those companies, the first issue to tackle is safety. Wood furniture is currently prosperous due to the building boom, however, production lines were found to contain a mix of old-fashioned equipment and new equipment reinforced with Mise a Niveau funds. There is room to raise the operating rate of equipment and improve processes. There are opportunities to rationalize operations through introducing the so-called Toyota system of eliminating waste and producing to demand. Improving the processing accuracy of woodworking operations is another issue for reinforcing competitiveness.

In the field of textiles and apparel, the study team visited typical subcontractor plants. These companies contribute to the securing of employment in local communities. They strive to manage plants under guidance from leading brand corporations, however, as wages increase it is predicted that competition will intensify with Asia and China in future. In order to sustain and strengthen competitiveness, there is room to examine improvements starting with motion study and time measurement and including the training of multi-skilled workers.

Companies in the printing and packaging materials (cans, bottles, film) sectors deal with the domestic market, and the visited companies were found to be well capable of competing with imports providing that they improve QCD management. Moreover, since it is expected that needs will keep growing for better containers, which influence the added value of products, and higher quality export packaging materials, it will be necessary to practice continuous improvement.

A company that specializes in making high-quality ladies' shoes targeting wealthy customers in Tunisia has an organized sales network and even conducts product planning. On the production side, it produces numerous models in small quantities and trains workers to be multi-skilled, however, in anticipation of higher personnel costs, it is also considering transferring operations overseas in future. The issue confronting it concerns the further development of domestic brands.

A welded steel pipe maker belonging to a conglomerate group had a relatively high management level. Notices showing 5S slogans in Arabic were observed at key points in the plant. However, the issue facing this company concerns how it can enhance QCD (quality, cost and delivery) in order to compete with imports.

An emulsion stabilizer maker in the food sector has accumulated know-how for making emulsion stabilizers according to various customer needs (bread, cake, ice cream, etc.) based on unique materials, and it has expanded into international markets. Although small, this company is growing as an internationally competitive corporation.

To sum up, looking at the industrial sector overall, companies that are able to compete in international markets in the age of liberation are extremely limited. However, even in order to survive in the domestic market, companies will still be exposed to free market conditions and they will need to make further improvements in QCD management as well as vigorously strive to develop new products, introduce new technologies and pioneer new markets from now on.

## (2) Company Visit Surveys in the Two Target Sectors

From large corporations to minute enterprises, 34 companies in the electric industry and 30 companies in the food processing industry were visited and analysis of current conditions in each company and sector was implemented. When making the visit surveys, taking into account the setting of selection criteria for target companies in the pilot project, current conditions were analyzed and assessments carried out from the viewpoint of raising international competitiveness in the areas of quality control technology and productivity improvement activities in each company.

(See Appendix A-3: Evaluation List of Visited Companies).

The findings of the analysis of current conditions in these two sectors were reported to Tunisian officials including other donors in the seminar that was staged on October 27, 2006. At this time, current conditions and problems in the two sectors, improvement approaches and survey methodology, etc. were introduced. The findings of the visit surveys and analysis of current conditions in each sector are as follows.

### [Electric industry sector]

Survey visits were made to 33 companies selected from electrical appliance assembly companies, electric component manufacturers, energy companies and labor-intensive companies. All the companies are actively involved in introducing ISO, and corporate managers and quality control managers are fully aware of the importance of quality and productivity. In addition to the acquisition of ISO, the companies aim to strengthen international competitiveness and expand exports through improving quality and productivity.

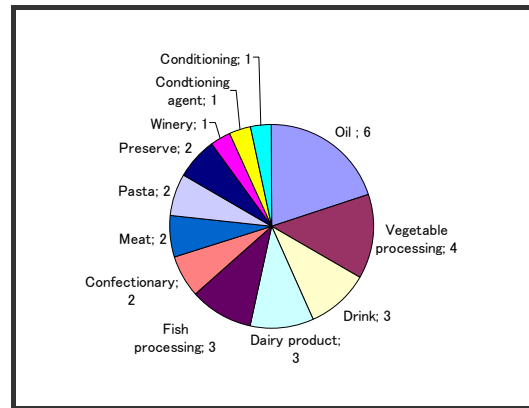


A common theme for all companies is economic dependence on Europe, that is components and production machines are imported from Europe, Europe is relied on for development, and Europe is the largest export market. In this respect, Tunisia differs greatly from countries in Southeast Asia. Companies have a high level of manufacturing technology, however, they mostly produce European brand products, whereas only a few companies produce unique brands. In other words, quality and maintenance control in manufacturing and production control are functioning on an organized basis. However, marketing, development and purchasing organizations are weak and companies are not functioning in these areas.

The machinery used in production processes is old and is not sufficient to impart international competitiveness in quality and productivity. However, there is plenty of room for improvement before renewing equipment, and the common issue that needs to be addressed is the improvement of layout. In particular, materials supply, line layout and the balance of work man-hours are poor. Concerning quality, the contents of each operator's work are not displayed and improvement can be made through introducing 5S, written instructions and QC circle activities. Numerous issues can be transferred in this project.

[Food processing sector]

The pie graph shows the number of visited companies in each sector. The average number of employees is 201, and 40% of the companies surveyed are major companies with a work force of 200 or more. 70% of companies are exporting companies, and 40% export more than half their products. Half of the companies have already acquired ISO certification, and 30% are preparing to



receive it. As a result of the company visits, seven problems were found to exist in many of the companies. Four of these are related to quality, while three are linked to productivity.

1. Irrespective of the acquisition of ISO certification or not, every plant has the common problem that basic hygiene, which is a prerequisite for ISO, is not thoroughly enforced. For example, flies were observed on production lines at every factory visited. This is frequently due to the fact that partitioning walls for maintaining sealing performance are not in place and doors are left permanently open.

2. Leaving aside food hygiene, numerous companies have quality problems such as infiltration by foreign objects and occurrence of nonconformities, etc., and they are having a hard time dealing with these issues.
3. Although only a few companies pointed to this as a problem, when companies attempt to export to the EU, they increasingly face the issue of having to secure food traceability.
4. Despite having problems like those described above, almost all the visited companies responded that they do not have quality problems. The concept of quality includes the three elements of design quality, manufacturing quality and market quality, whereas the quality concept held by the companies only covers a minor part of manufacturing quality. The problem is that companies lack the awareness that the final judge of quality is the market.
5. Many managers do not have a correct grasp of the concept of productivity. Many managers seem to think that improvement of productivity entails increasing production through increasing personnel or conducting plant investment.
6. Machine breakdowns frequently cause production stoppages and lead to lower plant productivity and human productivity. Since almost all food machines are imported, if companies do not possess maintenance technology or repair parts, they have to request engineers and parts from the countries of origin, and suspension of production at such times leads to major losses.
7. There is a lot of room to improve the productivity of manual labor. For example, the human productivity of tuna packing and chicken processing plants is around 30% lower than corresponding plants in competitor nations.

### **5.2.3 Staging of the Quality and Productivity Improvement Seminar and Workshops**

#### **(1) Staging of the seminar**

A seminar concerning improvement of quality and productivity was staged, with a view to also selecting candidate companies to host the pilot project in Phase 2. Details are as follows.

Date	: October 27, 2006 (Friday) 8.30~13.00
Venue	: Hotel Abou Nawas Tunis / Room Cartage Avenue Mohamed V 1080 Tunis Cedex, Tunisie Tel: (+216) 71- 350-355 / Fax: (+216) 71-354-986
Main objectives	: 1) To transfer fundamental knowledge concerning improvement of quality and productivity to pilot project candidate companies and Tunisian government agencies (including the technical centers) 2) To widely inform industrial circles in Tunisia about the objectives and activities of the study 3) Through seeking participants from the EU and other donors, to provide a venue for compiling a comprehensive master plan
Main contents	: 1) Opening address (Mme. Zangar Dorzaf L./Director of UGPQ) 2) Greetings from Mr. Machida, Manager of the JICA Office in Tunisia 3) Outline explanation of the Study (Mr. Kikuchi, JICA Study Team Leader)  ~ Next, the participants split up into two groups – electric and food – and lectures followed by questions and answers were held simultaneously. ~ - Electric sector (first half): “Analysis and QC at 33 companies in Tunisia) - Electric sector (second half): “Effects of trade liberalization and strengthening of international competitiveness based on quality” - Questions and answers (electric sector) - Food sector (first half): “Issues and problems in improvement of quality and productivity” - Food sector (second half): “Improvement measures in improvement of quality and productivity” - Questions and answers (For details, refer to the seminar program 2006 in Appendix A-4).
Participants	: Approximately 180  (Government agencies and public organizations: approximately 60/Donors: approximately 10/Private companies: approximately 100/Others: 10) Moreover, in advertising for participants, invitation cards 2006 (see Appendix A-5) were prepared and sent to approximately 500 addresses. For reference, seminar photographs 2006 (Appendix A-6) and articles on the seminar 2006 (Appendix A-8) are attached.

## (2) Staging of the Workshop (W/S)

In preparation for implementation of the pilot projects in Phase 2, workshops were staged in order to aid the capacity building of C/Ps and build consensus between the C/Ps and Study Team regarding fundamental know-how concerning quality and productivity.

In the Study, since the C/Ps accompanied the Study Team on the routine company visits and capacity building in the shape of OJT was routinely carried out, the workshops were implemented based around exchange of opinions on the following topics.

- Current conditions and importance of quality and productivity in the food industry (taking the company visits as case studies)
- Current conditions and importance of quality and productivity in the electric industry (taking the company visits as case studies)
- Examination of the contents of the quality and productivity improvement manual (electric) (confirmation of the existing CETIME manual)
- Examination of the contents of the quality and productivity improvement manual (food) (considering complementarity with the ISO manual prepared by the EU)

#### 5.2.4 Setting of the Pilot Project Target Companies Selection Criteria

Based on the draft criteria for selecting target companies in the pilot project that were proposed in the Inception Report, the selection criteria were set in discussions with the Tunisian side. In setting the criteria, ample attention was paid to ensure that the scale of companies, corporate operating capacity, range of products, existence of foreign capital and approach to obtaining ISO certification are obtained from the various survey findings following the pilot projects.

The selection criteria that were discussed and decided in the Coordination Committee (CC) held on September 4 and 5, 2006 are as follows.

Table 5-1 Selection Criteria for Model Companies for the Pilot Project

Selection Criteria		1 Point	3 Points	5 Points	Points Scored
1	Number of companies in the sub-sector	Low	Medium	High	
2	Exporting company, company with potential for import substitution or company which is likely to be threatened by competition from imported products	Low	Medium	High	
3	Company with room for quality and productivity improvement and with a real prospect of a positive outcome	Low	Medium	High	
4	Strong desire to achieve quality and productivity improvement and to cooperate with the pilot project on the part of the company owner	Low	Medium	High	
5	Situation of acquisition of ISO certification or HACCP	None	In Progress	Already Acquired	
Total Score		-	-	-	/25

#### 5.2.5 Selection of Pilot Project Target Companies

Based on the abovementioned selection criteria, assessment was carried out on the visited companies (see the Evaluation List of Visited Companies in Appendix A-3). Moreover, regarding 33 electric companies and 30 food processing companies that were visited, questionnaires were sent by facsimile in order to confirm desire to take part in the pilot project.

Upon conducting the said process, the pilot project target companies were finally selected in the Coordination Committee (CC) of December 1, 2006.

Table 5-2 shows the 15 companies in the electric and electronics sector and 14 companies in the food processing sector that were selected in the CC.

Table 5-2 List of Selected Model Companies for Pilot Project

[Electric Industrial Sector]				
No.	Name of Company	Name of Sub-Sector	Principal Products	Location
1	ABS Electronic	Electricity and Electronic Products	TV, airconditioner	Mateur
2	ARELEC	Electricity and Electronic parts	Conector for Power	Tunis
3	Bisma Cable	Electricity and Electronic parts	wireharness, cable, etc.	Tunis
4	COLDEQ	Electricity and Electronic Products	Refrigerator for truck	Ben Arous
5	GAN (Mont Blanc)	Household Electrical Goods	Regrigerator, Washing machine,	Ben Arous
6	GIE	Electricity and Electronic Products	Ballast Concent	Tunis
7	KACEM	Electricity and Electronic parts	Ballast, Transformer	SFAX
8	NOUR	Electricity and Electronic Products	Battery	Ben Arous
9	SEL	Electricity and Electronic Products	Lighting Box	Sfax
10	SIAME	Electricity and Electronic parts	Wireharness, cable, etc.	Nabeul
11	SOFTEN	Electricity and Electronic Products	Solar water heater	Nabeul
12	SOMEF	Electricity and Electronic parts	Switches Socket, Breaker	Tunis
13	TILC	Electricity and Electronic Products	Lighting, Concent	Tunis
14	TTI	Electricity and Electronic parts	Braker, Box	Nabeul
15	Vossloh Schwabe	Electricity and Electronic parts	Ballast, Connector	Ben Arous
[Food Processing Sector]				
No.	Name of Company	Name of Sub-Sector	Principal Products	Location
1	Huilerier Loued	Oil	Olive oil	Chibika
2	L'Appetissante	Confectionary	Biscuit, wafer	Tunis
3	La Générale Alimentaire JOUDA	Vegetable processing	Tomato paste, harissa	El Baten
4	Confiserie Triki-Le Moulin	Confectionary	Candy, gum, shamia	Sfax
5	S.C.A.P.C.B.	Vegetable processing	Tomate paste, harissa, pickled kidney beans, pickled olive, etc.	Grombalia
6	SNBG	Drink	Fruit juice, carbonated beverage	Grombalia
7	VACPA	Preserve	Dates	Ben Khalled
8	El Mazraa	Meat	Turky meat, chicken meat, sausage, catering (delicatessen)	Nabeul
9	ABCO	Fish processing	Canned tuna, canned sardine	Sidi Daoud
10	Medina	Vegetable processing	Artichoke, dried tomato, grilled salad	Zl de Jedeida
11	Sipa	Conditioning agent	Conditioning agent for bread and cake	Bizerte
12	CVBA	Winery	Wine	Bouargoub
13	Med Agro Ruspina	Oil	Olive oil	Moknine
14	Mouna Food	Vegetable processing	Salad in bottle	Mhemdia

## **Phase 2**

### **5.3 First Work in Japan (November 2006 ~ January 2007)**

#### **5.3.1 Compilation of the Pilot Project Implementation Plan**

With respect to the pilot project target companies that were selected in the second field survey, an implementation plan (draft) comprising the framework of the pilot project, division of work, schedule, monitoring and assessment method, etc. was prepared. Regarding each pilot project, care was taken to ensure that appropriate project management utilizing PDM techniques is performed.

#### **5.3.2 Preparation of the Quality/Productivity Improvement Manuals (Draft)**

Based on the pilot project implementation plan (draft), the “Quality and Productivity Improvement Manual (Draft)” was prepared for the electric sector and the food processing sector.

### **5.4 Second Field Survey (January 2007~March 2007)**

#### **5.4.1 Discussion and Compilation of the Pilot Project Implementation Plan**

The draft pilot projects implementation plan that was prepared in the first work in Japan was explained to and discussed with the Tunisian side and was approved in the Coordination Committee (CC) staged on January 12, 2007. Moreover, with the objective of sharing the pilot project implementation plan (draft) that was agreed in the CC with the companies targeted in the pilot project, a kick-off meeting was staged on January 16, 2007.

The kick-off meeting was attended by the senior executives, quality managers and production managers (i.e. personnel in charge of control departments) of the pilot project target companies. Explanations were given on the framework of the pilot project, the division of work and the implementation schedule, etc. and consent was obtained from the related officials.

The main points of the pilot project implementation plan are outlined below.

## **[Pilot Project Implementation Plan]**

### **1. Framework of pilot project implementation**

#### 1-1 Objectives

In order to compile a master plan (MA) for improvement of quality and productivity of industry in Tunisia, a pilot project (PP) comprising the following activities will be implemented.

- 1) Conduct practical transfer of technology to the counterparts (C/P) regarding the techniques and method of corporate diagnosis and improvement.
- 2) Based on agreement of related officials, implement support for improvement of quality and productivity to the model companies.
- 3) Demonstrate and complete various manuals (drafts) related to improvement of quality and productivity.
- 4) Propose systems for the ongoing promotion of quality and productivity improvement covering all industrial sectors in Tunisia.

#### 1-2 Target Sectors

The target sectors of the pilot project shall be “Electric and Electronics” and “Food Processing.”

#### 1-3 Implementation Period

Diagnosis and improvement will be implemented from January to October 2007. However, because the issues at hand and approaches required to overcome them differ according to each company, the amount of time required to conduct diagnosis and improvement will also vary between companies.

#### 1-4 Implementation Setup

- 1) The diagnosis and improvement teams for each sector will comprise members of the participating companies (executives or production managers of the model companies), UGPQ (at least 1 member) and the JICA consultants (at least 1 quality and productivity improvement officer), and the leader of each diagnosis and improvement team will be appointed from the model companies.
- 2) UGPQ will be the core promotion organization for the pilot project overall.

### **2. Scope and Method of Company Diagnosis and Improvement**

#### 2-1 Scope of Diagnosis and Improvement

Generally speaking, manufacturing comprises the following functions in addition to production activities: ① business strategy, ② marketing, ③ financial control, ④ personnel management, and ⑤ information management, etc. When conducting a general diagnosis of companies, it is necessary to diagnose all of these functions. However, the pilot project here will be implemented focusing on plant diagnosis and improvement directly related to quality and productivity improvement activities, and depending on the case, diagnoses may target functions other than production activities at the discretion of the diagnosis and improvement team.

#### 2-2 Diagnosis and Improvement Method

Prior to implementing the pilot project, a draft manual containing diagnosis and improvement techniques, etc. will be prepared. The diagnosis and improvement team will utilize this in the pilot project implementation phase in order to confirm its effectiveness and complete it following completion of the pilot project.

## 2-3 Approach to Problem Solving

- 1) The joint team of UGPQ experts and JICA consultants, based on discussions with each model company, will examine a number of approaches to handling the issues faced by each model company and select the approach considered most appropriate.
- 2) A time schedule for problem solving will be prepared for each model company.
- 3) The division of work for problem solving (division of roles between the model company, C/P and JICA consultants) will be decided and implemented for each model company.
- 4) The model companies will take the initiative in solving problems and will be supported by the team of UGPQ experts and JICA consultants.
- 5) In the pilot project implementation phase, monitoring will be implemented at the pre-determined time.
- 6) Based on the results of the pilot project, the final report will be prepared for the companies.

### 3. Work after Completion of the Pilot Project

- 3-1 Assess the outcomes of the pilot project. The assessment contents will be incorporated into the final report.
- 3-2 Complete a quality and productivity improvement manual that includes self-diagnosis and improvement techniques by companies for each sector, and also prepare a "Guidance Manual" for the C/Ps that will use the said manuals to conduct guidance.
- 3-3 Compile a draft plan of systems that will enable the ongoing promotion of quality and productivity improvement in all industrial sectors.
- 3-4 Reflect the outputs of the pilot project into compilation of the master plan and action plan.
- 3-5 Utilize successful cases in order to demonstrate and disseminate quality and productivity improvement in Tunisian industry.

### 4. Division of Roles

	Company	UGPQ Technical Center	JICA Consultant
Implementation of Pre-diagnosis (Including preparation of pre-diagnosis report)	○	○	◎
Selection of subject and planning of schedule for each company	◎ ◎ ◎		
Preparing diagnosis daily report		◎	△
Preparing manuals (bare-bones)		○	◎
Implementation of diagnosis and advising of solution method.		○→◎	◎→○
Implementation of KAIZEN	◎	○	○
Interim evaluation	◎ ◎ ◎		
Preparing proposal (final report) for company		◎	△
Finalization of manuals		◎	△
Preparing case study report		◎	△
Organization of W/S regarding system building for implementation of sustainable KAIZEN	○	○	◎
Final evaluation	◎	◎	◎
Transfer of procedure		◎ ◎	

◎ : Responsible Actor    ○ : Supporting Actor  
 △ : Supervising Editor    ■ : Council



#### **5.4.2 Sharing and Correction of the Quality/Productivity Improvement Manuals**

It was agreed to share the composition and contents of the quality and productivity improvement manuals (draft) prepared in each sector in discussions with the C/P, and to make appropriate corrections via implementation of the pilot project.

#### **5.4.3 Preparation of the Implementation Plan Concerning Company Diagnosis and Proposal Compilation**

Based on the pilot project implementation plan, first the company-separate mini diagnoses were implemented. In these mini diagnoses, in addition to confirming the company representatives of the improvement teams (consisting of representatives from the C/P, JICA consultant and model companies), improvement issues for each company were selected.

The pilot project implementation plans for each company that were set by the improvement teams are as shown in Table 5-3. Moreover, Table 5-4 shows the schedule during the pilot project period.

Table 5-3 Pilot Project Implementation Plans for Each Company

(Electric Industrial Sector)

	Company	Main Products	Issues	Target Department	Improvement Team Members			
					Model Company	UGPQ	CETIME	JICA Team
1	ABS Electronic	TV, airconditioner	1. 5S 2. Improvement	Assembly	Anooar BEJADOU	Mohsen MAAMOURI	Mohamed CHEBBI	Yuichi FUKUSHIMA Kiyoshi SAKAI
2	ARELEC	Conector for Power	1. 5S 2. Layout	Overall	Aamor BOUCHIBA	Mohsen MAAMOURI	Yosr SABBEGH Ramzi METHAMMEM	Yuichi FUKUSHIMA Kiyoshi SAKAI
3	Bisma Cable	Wireharness, cable, etc.	1. Layout 2. Standard work	Overall	Mahrg El AOVEL	Mohsen MAAMOURI	Ramzi METHAMMEM	Yuichi FUKUSHIMA Kiyoshi SAKAI
4	COLDEQ	Refrigerator for truck	1. Layout 2. 5S	Overall	Hedi DRIZET	Mohsen MAAMOURI	Yosr SABBEGH	Yuichi FUKUSHIMA Kiyoshi SAKAI
5	GAN (MontBlanc)	Regrigerator, Washing machine,	1. Tooling time shortening 2. Layout	1. Plastic molding 2. Assembly	Bassem Ben ABDALLAH	Mohsen MAAMOURI	Ramzi METHAMMEM	Yuichi FUKUSHIMA Kiyoshi SAKAI
6	GIE	Ballast Concent	1. Work standards 2. Layout 3. Improvement of productivity in the molding and press plant	1. Assembly line 2. Molding and press	Mhadhbi Samir	Mohsen MAAMOURI	Yosr SABBEGH	Yuichi FUKUSHIMA Kiyoshi SAKAI
7	KACEM	Ballast, Transformer	1. 5S 2. Layout	1. Assembly 2. Press 3. Stock control	Mohamed Kacem	Mohsen MAAMOURI	Mohsen MAAMOURI	Yuichi FUKUSHIMA Kiyoshi SAKAI
8	NOUR	Battery	1. TPM 2. 5S	Overall	Mre Ghassallel Fater	Mohsen MAAMOURI	Mohamed CHEBBI	Yuichi FUKUSHIMA Kiyoshi SAKAI
9	SEL	Lighting Box	1. Improvement of productivity in the spot welding process	Spot Welding	Habib Belgaroui	Mohsen MAAMOURI	Mohsen MAAMOURI	Yuichi FUKUSHIMA Kiyoshi SAKAI
10	SIAME	Wireharness, cable, etc.	1. 5S 2. Improvement		Habib Ayouni	Mohsen MAAMOURI	Afifa OUMAYA	Yuichi FUKUSHIMA Kiyoshi SAKAI
11	SOFTEN	Solar water heater	1. 5S 2. Layout		Mustapha Jebrill	Mohsen MAAMOURI	Afifa OUMAYA	Yuichi FUKUSHIMA Kiyoshi SAKAI
12	SOMEF	Switches Socket, Breaker	1. Waste removal from injection molding	Injection molding	Ameur CHAMMAKHI	Mohsen MAAMOURI	Mohamed CHEBBI	Yuichi FUKUSHIMA Kiyoshi SAKAI
13	TILC	Lighting, Concent	1. Line balance productivity	Overall	Chraiet Abdelhafid	Mohsen MAAMOURI	Ramzi METHAMMEM	Yuichi FUKUSHIMA Kiyoshi SAKAI
14	TTI	Braker, Box	1. Qc circle 2. Waste removal	Overall	Atef Saanouni	Mohsen MAAMOURI	Mohsen MAAMOURI	Yuichi FUKUSHIMA Kiyoshi SAKAI
15	Vossloh Schawabe	Ballast, Connector	1. Q66 productivity improvement	Limited models	Hedi DRIZET	Mohsen MAAMOURI	Ramzi METHAMMEM	Yuichi FUKUSHIMA Kiyoshi SAKAI

## (Food Processing Sector)

	Company	Main Products	Issues	Target Department	Improvement Team Members			
					Model Company	UGPQ	CTAA	JICA Team
1	Huilerier Loued	Oil	1. Thorough enforcement of hygiene control fundamentals	All departments	Nóeméne DAUDI (Responsable du Laboratprie)	Fatma GOUELLOUZ	Selima B. Jihene G.	Seiji SUGIMOTO Yuji KATO
2	L'Appétissante	Confectionary	1. Reduction of losses caused by quality defects 2. Prevention of infiltration of foreign objects	Biscuit department All departments	Sadok BOUZIDI (Responsable Qualité)	Fatma GOUELLOUZ	Selima B. Jihene G.	Seiji SUGIMOTO Yuji KATO
3	La Générale Alimentaire JOUDA	Vegetable processing	1. Improvement of efficiency of energy use 2. Thorough enforcement of hygiene control fundamentals	Tomato washing department All departments	Amel DKIOLI (Responsable Qualité)	Fatma GOUELLOUZ	Mohamed HEJERI	Seiji SUGIMOTO Yuji KATO
4	Confiserie Triki-Le Moulin	Confectionary	1. Reduction of nonconformities in manufacturing 2. Shortening of retooling time 3. Thorough enforcement of hygiene control fundamentals	Candy molding and packaging department Packaging department All departments	Bouthania MAAZOUN (Directrice Qualité & Sécurité)	Fatma GOUELLOUZ	Selima B. Jihene G.	Seiji SUGIMOTO Yuji KATO
5	S.C.A.P.C.B.	Vegetable processing	1. Improvement of machine operating rates 2. Rust prevention of cans 3. Improvement of organized productivity	Harisa, Tomato paste and harisa Manufacturing department and marketing department	Messaoudi LAZHAR (Responsible Production)	Fatma GOUELLOUZ	Anis MAHJOUB	Seiji SUGIMOTO Yuji KATO
6	SNBG	Drink	1. Improvement of machine operating rates 2. Thorough enforcement of hygiene control fundamentals	Juice filling department All departments	Ben Khedher AHMED (Directeur Central)	Fatma GOUELLOUZ	Melika HERMASSI	Seiji SUGIMOTO Yuji KATO
7	VACPA	Preserve	1. Improvement in long-term storage of raw materials 2. Improvement of human productivity	Dates in cold storage Pip removal, weighing, packaging department	Tale SALHA (Quality Manager)	Fatma GOUELLOUZ	Fatma GOUELLOUZ	Seiji SUGIMOTO Yuji KATO
8	El Mazraa	Meat	1. Improvement of human productivity	Chicken, turkey and salami departments	Anis DELZANZ	Fatma GOUELLOUZ	Melika HERMASSI	Seiji SUGIMOTO Yuji KATO
9	ABCO	Fish processing	1. Improvement of human and equipment productivity rates	Manufacturing department	Mohamed SKIKER (Responsable Qualité)	Fatma GOUELLOUZ	Fatma GOUELLOUZ	Seiji SUGIMOTO Yuji KATO
10	Medina	Vegetable processing	1. Improvement of human productivity	Manufacturing department	Mounira Jandoubi (Responsable QC)	Fatma GOUELLOUZ	Mohsen NAJJAR	Seiji SUGIMOTO Yuji KATO
11	Sipa	Conditioning agent	1. Thorough enforcement of hygiene control fundamentals	Manufacturing department	Mohamed HRIZI	Fatma GOUELLOUZ	Mohsen NAJJAR	Seiji SUGIMOTO Yuji KATO
12	CVBA	Winery	1. Thorough enforcement of hygiene control fundamentals 2. Shortening of retooling time	All departments Filling in and packaging department	Ridah BEN KNESIB (Directeur Technique)	Fatma GOUELLOUZ	Mohamed HEJERI	Seiji SUGIMOTO Yuji KATO
13	Med Agro Ruspina	Oil	1. Improvement of human and equipment productivity rates	Filling in and packaging department	M. HACHICHA	Fatma GOUELLOUZ	Selima B. Jihene G.	Seiji SUGIMOTO Yuji KATO
14	Mouna Food	Vegetable processing	1. Improvement of productivity 2. Prevention of infiltration of foreign objects	All departments All departments	Mouafak RIADH (Manager) Rkai LOTFI	Fatma GOUELLOUZ	Anis MAHJOUB	Seiji SUGIMOTO Yuji KATO

Table 5-4 Tentative Schedule of Pilot Project and Work Description

			2007									
			1	2	3	4	5	6	7	8	9	10
UGPQ / Technical Center Consultant												
JICA Consultant Team												
Enterprises												
○	◎	○	<b>Exécution du diagnostic préliminaire (Y compris la préparation du Rapport de diagnostic préliminaire)</b> <i>Implementation of Pre-Diagnosis (Including Preparing of Pre-Diagnosis Report)</i>									
◎	◎	◎	<b>Sélection des Sujets et l'établissement d'un Programme pour chaque entreprise</b> <i>Selection of Subject and Planning of Schedule for each company</i>									
○	◎	○	<b>Exécution de Diagnostic et conseiller des Méthodes de Solution.</b> <i>Implementation of Diagnosis and advising of Solution Method.</i>									
○	○	◎	<b>Exécution de KAIZEN</b> <i>Implementation of KAIZEN</i>									
◎	◎	◎	<b>Evaluation Provisoire</b> <i>Interim Evaluation</i>									
◎	△		<b>Préparation des Propositions (Rapport Définitif) pour l'Entreprise</b> <i>Preparing Proposal (Final Report) for Enterprise</i>									
◎	△		<b>Finalisation des Manuels</b> <i>Finalization of Manuals</i>									
◎	△		<b>Préparation du Rapport sur les Etudes de CAS</b> <i>Preparing Case Study Report</i>									
◎	◎	◎	<b>Evaluation Définitive</b> <i>Final Evaluation</i>									

#### 5.4.4 Compilation of Proposals for the Target Companies and Monitoring and Evaluation of the Condition of Implementation of Proposals

The conditions of pilot project implementation will be monitored and evaluated in order to modify the activities according to the smooth implementation and necessity of the pilot project.

Concerning the evaluation period and contents, the JICA consultant proposal was prepared and this was explained to and discussed with the UGPQ side. As a result, this was approved in the CC staged on January 12, 2007, when it was decided to implement an intermediate evaluation (June 2007) and final evaluation (December 2007).

It was decided to appropriately amend the evaluation items according to necessity. Table 5-5 below shows the evaluation items included in the pilot project implementation plan.

Table 5-5 Evaluation items of Pilot Project

Evaluation Items	Evaluation	Remarks (Request)
1. Overall Evaluation of the PP Implementation Plan		
① Appropriateness of the selected problems (themes)	1 2 3 4 5	
② Appropriateness of the selected approach	1 2 3 4 5	
③ Degree of achievement of the expected goals/outcomes	1 2 3 4 5	
④ Composition of the team	1 2 3 4 5	
2. Transfer of Skills (Techniques) to the C/Ps		
① Transfer of basic and practical skills for quality and productivity improvement to the C/Ps	1 2 3 4 5	
② Transfer of guidance and extension methods for quality and productivity improvement to the C/Ps	1 2 3 4 5	
3. Transfer of Skills (Techniques) to the Model Companies		
① Evidence of concrete “quality improvement” and/or “productivity improvement”	1 2 3 4 5	
② Establishment of a system or basis for “quality improvement” and/or “productivity improvement” to suggest a positive outcome in the near future	1 2 3 4 5	
③ Learning of the self-diagnosis/improvement techniques for “quality improvement” and/or “productivity improvement”	1 2 3 4 5	
4. Degree of Satisfaction of the Model Company Owner		
① Degree of satisfaction with the PP results	1 2 3 4 5	

## **5.5 Second Work in Japan (March 2007 ~May 2007.)**

### **5.5.1 Preparation of Progress Report**

A progress report was prepared based on the contents of the first field survey and the results of the pilot project in the second field survey.

## **5.6 Third Field Survey (May 2007 ~ July 2007.)**

### **5.6.1 Compilation of Proposals for Target Companies and Monitoring and Evaluation of Implementation Conditions**

Following on from the second field survey, company diagnoses were carried out regarding the pilot project target companies based on the implementation plan. In addition to compiling proposals for quality/productivity improvement upon gauging the issues and improvement points in each company, conditions surrounding implementation of the recommended items were monitored appropriately.

## **5.7 Third Work in Japan (July 2007 ~ September 2007.)**

### **5.7.1 Training in Japan**

Eight of the counterparts received training in Japan for two weeks from August 16 to August 29, 2007. In response to requests from the counterpart agencies, the training program was arranged with the emphasis on observation of production lines in Japanese companies, visits to related agencies and study of Japanese cases rather than classroom learning. The trainees consisted of managers and engineers at technical centers and management personnel at counterpart agencies who conduct direct guidance of companies in Tunisia. The training program and syllabus are as indicated below in Tables 5-6 and 5-7 respectively.

Table 5-6 Training Program

Date	Day	AM/PM	Training Item	Place
Aug. 16	Thurs.	AM	Briefing and programme orientation	JICA (Tokyo)
		PM	Trade policies in post-war Japan and their implications for developing countries	JICA (Tokyo)
Aug. 17	Fri.	AM	SME support policies in Japan	Organization for Small and Medium Enterprises and Regional Innovation, Japan (SMRJ)
		PM	Productivity improvement activities in Japan and Asia	Asia Productivity Organization (APO)
Aug. 18	Sat.	AM	Technology transfer and technological innovation at SMEs	JICA (Tokyo)
		PM	Sorting of the gathered materials	
Aug. 19	Sun.	AM/PM	Sorting of the gathered materials	
Aug. 20	Mon.	AM	Regional promotion policies	Industrial Promotion Division, Industrial Economy Department, Ohta Ward Office, Tokyo
		PM	Visit to the actual manufacturing site of a parts manufacturer	Mitsubac Co., Ltd.
Aug. 21	Tues.	AM	Quality management and production management in the beverage industry	Shonan Plant of Kirin Beverage Co., Ltd.
		PM	Japanese-style quality management	Union of Japan Scientists and Engineers (JUSE)
Aug. 22	Wed.	AM	Travelling	
		PM	Quality management and productivity improvement in the household electrical appliance industry	Shizuoka Plant of Mitsubishi Electric Corporation
Aug. 23	Thurs.	AM	Productivity improvement in Singapore	JICA (Tokyo)
		PM	Corporate approach to quality management and HACCP, etc.	Tsurumi Plant of Morinaga & Co., Ltd.
Aug. 24	Fri.	AM	Travelling	
		PM	Quality management and productivity improvement in the precision machining industry	Kofu Office of Yokogawa Electric Corporation
Aug. 25	Sat.	AM/PM	Sorting of the gathered materials	
Aug. 26	Sun.	AM/PM	Travelling	
Aug. 27	Mon.	AM	Proposals for quality and productivity improvement to strengthen international competitiveness	JICA (Central Region)
		PM	Toyota's production system and its reality (I)	Toyota Motor Corporation
Aug. 28	Tues.	AM	Toyota's production system and its reality (II)	Denso Corporation
		PM	Travelling	
Aug. 29	Wed.	AM	Wrapping-up meeting and evaluation	JICA (Tokyo)

Table 5-7 Syllabus

<b>Date</b>	<b>16<sup>th</sup> August, 2007</b>
Lecture Title	Trade Policies in Post-War Japan and Their Implications for Developing Countries
Lecturer (Position)	Prof. Masatako Wada, Faculty of Economics, Tokyo University
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Changes and characteristics of trade in post-war Japan (changes of the trade structure and the current trade structure)</li> <li>2. Development factors for trade and trade policies in post-war Japan (business environment for Japan, efforts of the private sector and role of the government)</li> </ol>
<b>Date</b>	<b>17<sup>th</sup> August, 2007</b>
Lecture Title	SME Support Policies in Japan
Lecturer (Position)	Mr. Makoto Ihara, Deputy Manager, International Division, International Control Office, SMRJ
Key Points of Lecture	Changing role of the SMRJ for the development of SMEs in Japan and the operating system, organizational structure and main activities, particularly those related to quality and productivity improvement, of the SMRJ
<b>Date</b>	<b>17<sup>th</sup> August, 2007</b>
Lecture Title	Productivity Improvement Activities in Japan and Asia
Lecturer (Position)	Mr. Kenneth Mok, Director, Administration and Finance Department, and Mr. Takuki Murayama, Director, Industry Department, Asian Productivity Organization (APO)
Key Points of Lecture	Role played by the APO for quality and productivity improvement in Asia, historical changes of the organizational structure and activities of the APO and examples of promoting productivity improvement activities in specific countries in Asia
<b>Date</b>	<b>18<sup>th</sup> August, 2007</b>
Lecture Title	Technology Transfer and Technological Innovation at SMEs
Lecturer (Position)	Prof. Masatake Wada, Faculty of Economics, Tokyo University
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. General image of technological innovation at SMEs in Japan</li> <li>2. Technological innovation in the car parts industry in Japan</li> <li>3. Independent and innovative SMEs in Japan</li> <li>4. Silicon valley model for venture capitals in Japan</li> </ol>
<b>Date</b>	<b>20<sup>th</sup> August, 2007</b>
Lecture Title	Regional Promotion Policies
Lecturer (Position)	Mr. Hideo Hagiwara, Manager, and Mr. Takeshi Aoki, Industrial Promotion Division, Industrial Economy Department, Ohta Ward Office
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Present situation and problems of industrial promotion in Ohta Ward</li> <li>2. History of industrial promotion in Ohta Ward</li> <li>3. Geographical conditions and problems of industrial promotion in Ohta Ward</li> <li>4. Policies and prospects for industrial promotion in Ohta Ward</li> </ol>
<b>Date</b>	<b>20<sup>th</sup> August, 2007</b>
Lecture Title	Manufacturing Site of a Parts Manufacturer
Lecturer (Position)	Mr. Koichi Watanabe, Managing Director, Mitsuvac Co., Ltd.
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Manufacturing site of the parts industry in Japan</li> <li>2. Approach of the parts industry to quality management</li> <li>3. Quality and productivity improvement approaches</li> </ol>
<b>Date</b>	<b>21<sup>st</sup> August, 2007</b>
Lecture Title	Quality Management and Production Management in the Beverage Industry
Lecturer (Position)	Mr. Sanae Eguchi, Chief, Publicity Desk, General Affairs Department, Shonan Plant, Kirin Beverage Co., Ltd.
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of the Shonan Plant</li> <li>2. Quality and productivity improvement approaches</li> <li>3. Symbiotic plant with the local community</li> </ol>



<b>Date</b>	<b>21<sup>st</sup> August, 2007</b>
Lecture Title	Japanese Style Quality Management
Lecturer (Position)	Mr. Ichiro Ko-otsuka, Counselor, Director of Business Department and Head of International Office, JUSE
Key Points of Lecture	Role played by the JUSE in quality and productivity improvement in Japan and the operating system, organizational structure and activities of the JUSE (award system, training courses/seminars, research activities and publications)
<b>Date</b>	<b>22<sup>nd</sup> August, 2007</b>
Lecture Title	Quality Management and Productivity Improvement in the Household Electrical Appliance Industry
Lecturer (Position)	Mr. Nobuhito Nishizaki, General Affairs Division, General Affairs Department, Shizuoka Plant, Mitsubishi Electric Corporation
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. History of Japan's household electrical appliance industry</li> <li>2. Characteristics of the production system of Mitsubishi Electric Corporation</li> <li>3. Quality and productivity improvement approaches</li> </ol>
<b>Date</b>	<b>23<sup>rd</sup> August, 2007</b>
Lecture Title	Productivity Improvement in Singapore
Lecturer (Position)	Mr. Yasushi Fukuda, Fukuda Office of Professional Engineers
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of the Productivity Development Project in Singapore</li> <li>2. Issues relating to the transfer of the management system</li> <li>3. Establishment of a Q/PI system (overall picture and the basic programmes for 5S and Kaizen)</li> </ol>
<b>Date</b>	<b>23<sup>rd</sup> August, 2007</b>
Lecture Title	Concrete Approach to Quality Management and HACCP, etc.
Lecturer (Position)	Mr. Hideo Umezawa, Deputy Manager, Tsurumi Plant, Morinaga & Co., Ltd.
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of the Tsurumi Plant</li> <li>2. Efforts to obtain ISO certification and HACCP</li> <li>3. Quality management improvement measures</li> </ol>
<b>Date</b>	<b>24<sup>th</sup> August, 2007</b>
Lecture Title	Quality Management and Productivity Improvement in the Precision Machining Industry
Lecturer (Position)	Mr. Hisaya Furuya, Kofe Gr. Chief, Practicing Division, NYPS Promotion Department, Yokogawa Electric Corporation
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of the NYPS (New Yokogawa Production System)</li> <li>2. Characteristics of production at the Kofu Plant</li> <li>3. Improvement of manufacturing activities using the NYPS</li> </ol>
<b>Date</b>	<b>27<sup>th</sup> August, 2007</b>
Lecture Title	Proposals for Quality and Productivity Improvement to Strengthen International Competitiveness
Lecturer (Position)	Mr. Tsuyoshi Kikuchi, Team Leader, Master Plan Study for Quality and Productivity Improvement in Tunisia
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Pending tasks for strengthening of the international competitiveness</li> <li>2. Strengthening of the international competitiveness through quality and productivity improvement</li> <li>3. Proposals for quality improvement</li> <li>4. Proposals for productivity improvement</li> <li>5. Development of a suitable environment for quality and productivity improvement</li> </ol>
<b>Date</b>	<b>27<sup>th</sup> August, 2007</b>
Lecture Title	Toyota's Production System and Its Reality (I)
Lecturer (Position)	Mr. Kiyoshi Watanabe, Overseas Group, Company PR Department, Toyota Motor Corporation
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of Toyota Motor Corporation</li> <li>2. Toyota's production system</li> </ol>
<b>Date</b>	<b>28<sup>th</sup> August, 2007</b>
Lecture Title	Toyota's Production System and Its Reality (II)
Lecturer (Position)	Mr. Takeshi Kato, No. 2 Planning Office, General Affairs Department, Head Office, Denso Corporation
Key Points of Lecture	<ol style="list-style-type: none"> <li>1. Outline of Denso Corporation</li> <li>2. Environmental Issues</li> <li>3. Toyota's production system</li> </ol>

## **5.8 Fourth Field Survey (September 2007 ~Middle of October 2007)**

### **5.8.1 Compilation of Proposals for Three Target Companies and Monitoring and Evaluation of the Condition of Implementation of Proposals**

Following on from the third field survey, company diagnoses were carried out regarding the pilot project target companies based on the implementation plan. In addition to compiling proposals for quality/productivity improvement upon gauging the issues and improvement points in each company, conditions surrounding implementation of the recommended items were monitored appropriately.

### **5.8.2 Completion of the Quality/Productivity Manual**

Based on the conditions of implementation of the pilot project, problems and improvement points in the Quality/Productivity Manual were gauged and analyzed, and the manual was completed as a resource for utilization by the counterparts in conducting guidance for companies via the joint work and by companies themselves in the target sectors. (See the Draft Final Report: Manual).

### **5.8.3 Closing Ceremony**

On completion of the pilot project (PP), the Closing Ceremony was staged for officials of the participating companies at the UTIC facility “La Maison de L’Entreprise.” At the ceremony, the Director of UGPQ and JICA Team Leader presented PP participation certificates and company-separate PP final reports (containing the PP participation contents and proposals for the future) to each company. Also, the officials from the participating companies each said a few words of appreciation.

## **Phase 3**

## **5.9 Fourth Field Survey (October 2007 ~December 2007)**

### **5.9.1 Preparation of the Master Plan for Quality / Productivity Improvement (Draft)**

The draft master plan containing guidance methods and planning for companies other than the pilot project target companies in the electric appliance and food processing sectors was prepared. This was discussed with the Tunisian side and general agreement was arrived at on the framework.

### **5.9.2 Preparation of the Dissemination Seminar Implementation Plan (Draft) and Staging of the Dissemination Seminar**

The implementation plan of the dissemination seminar for companies other than the pilot project target companies in the electric appliance and food processing sectors was prepared. This contained details on the organizers and topics of individual seminars, schedule, frequency of seminars, target participants and venues.

The program of the seminar was composed of the current condition of quality/productivity improvement measures in the UGPQ, examples of quality/productivity improvement measures in Japanese companies, successful examples among the PP companies, and an outline of the Manual. In particular, since the seminar contained presentations by technical center consultants as well as presentations by companies that achieved success in the pilot project, the contents were extremely demonstrative.

Moreover, the seminar was staged at two locations in the capital Tunis and in Sfax (the second largest city in the country located approximately 260 km south of Tunis). On both occasions, through holding tours of production lines at the companies that gave presentations on the day after the seminar, the participants had a precious opportunity to directly confirm the effects of Kaizen on production lines.

Date	: November 22, 2007., 8.30~13.30
Venue	: Hotel Africa Tunis / Room “Malawi” and “Zambeze” 50, Avenue Habib Bourguiba B.P. 73 – 1001 Tunis Tunisie Tel: (+216) 71- 347 -477 / Fax: (+216) 71-257 -952
Main objectives	: 1) To inform related officials in Tunisian companies and education agencies about quality/productivity improvement activities. 2) Through explaining to participants the contents of the manual that was prepared in the pilot project, to give an outline introduction to the quality/productivity improvement support services that can be implemented by the UGPQ and technical centers in future. 3) Through having model companies present the activities they implemented and results they achieved in the PP, to raise the level of interest in quality/productivity improvement activities among companies that weren't targeted (including those in other sectors).
Main contents	: 1) Opening address (Mme. Zangar Dorzaf L./Director of UGPQ) 2) Greetings from Mr. Machida, Resident representative / JICA Tunisia Office 3) Outline explanation of the Pilot Project (Mme. Zangar Dorzaf L./Director of UGPQ) 4) Quality/Productivity Improvement in Japan (M. Sakai / Expert of JICA Study Team) 5) Presentation of Results of Pilot Project  (Next, the participants split up into two groups – electric and food Sector–) - Electric sector : Presentation of PP results by PP model companies (“SOMEF” / “SOFTEN”) - Electric sector : Presentation of Manual by consultant of technical center (CETIME) - Food Processing sector : Presentation of PP results by PP model companies (“SNBG” / “VACPA”) - Food Processing sector : Presentation of Manual by consultant of technical center (CTAA) - Questions and answers 6) Closing Remarks (Mr. Kikuchi / JICA Study Team Leader) (For details, refer to the seminar program 2007 in Appendix A-10.)
Participants	: Approximately 140

Date : December 04, 2007., 8.30~13.30  
Venue : Hotel Mercure Sfax / Room “Cartage 4 ”  
Boîte Postale N° 544 Avenue Habib Bourguiba Sfax, Tunisie  
Tel: (+216) 74- 255-700 / Fax: (+216) 71-255 -521

Main objectives : 1) To inform related officials in Tunisian companies and education agencies about quality/productivity improvement activities.  
2) Through explaining to participants the contents of the manual that was prepared in the pilot project, to give an outline introduction to the quality/productivity improvement support services that can be implemented by the UGPQ and technical centers in future.  
3) Through having model companies present the activities they implemented and results they achieved in the PP, to raise the level of interest in quality/productivity improvement activities among companies that weren't targeted (including those in other sectors).

Main contents : 1) Opening address (Mme. Zangar Dorzaf L./Director of UGPQ)  
2) Greetings from Mr. Machida, Resident representative / JICA Tunisia Office  
3) Outline explanation of the Pilot Project (Mme. Zangar Dorzaf L./Director of UGPQ)  
4) Quality/Productivity Improvement in Japan (M. Sakai / Expert of JICA Study Team)  
5) Presentation of Results of Pilot Project  
- Electric sector :  
Presentation of PP result by PP model companies (“KACEM”)  
- Electric sector :  
Presentation of Manual by consultant of technical center (CETIME)  
- Food Processing sector :  
Presentation of PP result by PP model company (“Ruspina”)  
- Food Processing sector :  
Presentation of Manual by consultant of technical center (CTAA)  
- Questions and answers  
6) Closing Remarks (Mr. Kikuchi / JICA Study Team Leader)  
(For details, refer to the seminar program 2007 in Appendix A-10.)

Participants : Approximately 60

Moreover, in advertising for participants, invitation cards 2007 (see Appendix A-11) were prepared and sent to approximately 900 addresses.

For reference, seminar photographs 2007 (Appendix A-12) are attached.

## **5.10 Third Work In Japan (January 2008 ~March 2008)**

### **5.10.1 Preparation of Draft Final Report**

Based on the results of the various activities described so far and the outcomes of the pilot project, proposals for their nationwide application in Tunisia and those for the master plan and action plan were prepared and the Draft Final Report (DF/R) was compiled.

## **5.11 Fifth Field Survey**

### **5.11.1 Explanation of DF/R**

The Coordination Committee was held on May 20, 2008, at which time full explanations and exchange of opinions were conducted with related officials regarding the contents of the DF/R. As a result, the contents of the DF/R were approved by the assembled members. See Annex A-13: M/M (signed on May 5, 2008) for the detailed contents of the discussions.

## **5.12 Fourth Work in Japan**

### **5.12.1 Compilation of the Final Report**

Based on the comments obtained from related officials at the CC on May 20, 2008, modifications were made to the DF/R, resulting in the Final Report (F/R), which was submitted to JICA.



## **6. Results of the Study**

As was described in the Objectives of the Study earlier, the Study had the following three anticipated outputs and levels of achievement.

- (1) The pending issues of the food processing and electric industrial sectors for quality/productivity improvement were clarified.

The first field survey (September ~ November 2006) revealed in a rough manner the quality/productivity improvement issues facing companies in Tunisia, and these became clearer through implementation of the pilot project (PP) (the second, third and fourth field surveys, all implemented in 2007).

Due to the limited time, issues were narrowed down to 2~3 per company in the PP, and the issues and guidelines that each company need to tackle more in the future were compiled into the final report that was presented to the company representatives in the Closing Ceremony.

- (2) The quality/productivity of each model company was improved by conducting the pilot project and techniques for quality/productivity improvement activities, such as the 5Ss, KAIZEN and

Toyota production system, were transferred to the Tunisian side by means of jointly conducting a pilot project with staff of the UGPQ.

In the pilot project, target companies were divided between the electric industrial sector and the food processing sector. At each company, the team of JICA consultants and counterparts (UGPQ staff and technical center consultants) conducted company diagnosis, extracted issues, applied techniques and approaches for resolving the issues and worked with the company team on promoting quality/productivity improvement. As a result, more than half the participating companies (27 companies in the final analysis) were able to demonstrate concrete quality/productivity improvement results during the PP period. Moreover, the responsible personnel in the target companies and the counterparts were able to acquire the quality/productivity improvement techniques and approaches that were applied in the PP. Furthermore, through taking part in preparation of the Manual, the counterparts were able to more firmly establish the know-how and theory underlying the techniques and approaches. The counterparts may be able to independently offer guidance to companies if the contents were the same as in the PP, however, in order for them to become capable of freely applying such guidance to real situations, they will need to build their experience while receiving support from internationally experienced consultants

- (3) The Manual, Master Plan and Action Plan for quality/productivity improvement were compiled to provide guidance for companies to improve their quality/productivity in a practical manner using the results of the pilot project.

In line with implementation of the pilot project (PP), a manual (electric industrial sector version and food processing sector version) reflecting the PP experiences was prepared. The counterparts themselves were actively involved (under guidance from the JICA consultants) in the preparation of the Manual to ensure that it will be an effective tool for when the counterparts independently conduct guidance for companies in the future. Moreover, the Master Plan and Action Plan were prepared upon exchanging experiences and information with the counterparts and officials of related agencies in Tunisia.

## **7. Issues and Recommendations for Improvement of Quality/Productivity**

The overall objective of the project is to conduct survey and analysis of the electric and electronic and food processing sectors, which are important industries for Tunisia, and to compile a master plan comprising policies, implementation setup and action plan, etc. for improvement of quality and productivity.

The overall project is divided into three phases. In Phase I, a fact-finding survey of enterprises was carried out and the pilot project target enterprises were selected. In Phase II, the pilot project was

implemented, and during this a manual corresponding to current conditions in Tunisia was compiled. In compilation of the master plan, various assumptions that were set ahead in advance were verified during implementation of the pilot project, and the results were compiled into recommendations (Phase III). (See Figure 7-1)

In this chapter, the following activities are described:

- 1) Verification of the assumptions that were set ahead of the pilot project. Verification was implemented during implementation of the pilot project.
- 2) Based on the results, extraction of the priority issues that Tunisia needs to work on in future in order to improve quality/productivity.
- 3) Proposal of recommendations concerning “What needs to be done” in order to resolve the said issues.

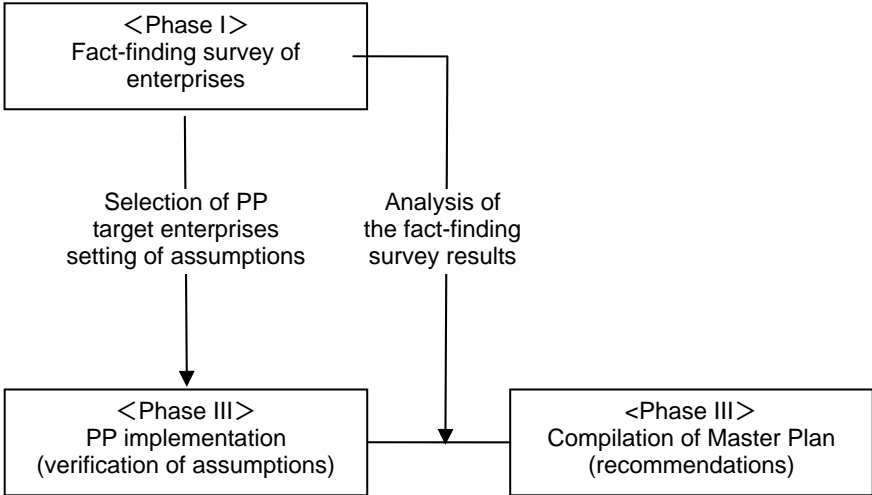


Figure 7-1 Linkage of Each Phase

**7.1 Outline of the Pilot Project and Assumptions in Implementation**

**7.1.1 Outline of the Pilot Project**

The pilot project was launched at the Kick-off meeting on January 16, 2007 and completed at the closing ceremony on October 25. Whereas the number of targeted enterprises was 15 in the electric and electronic sector and 14 in the food processing sector, this fell to 14 and 13 enterprises respectively over the nine months or so of pilot project implementation<sup>1</sup>.

<sup>1</sup> There were 15 enterprises in the electric and electronic sector and 14 in the food processing sector at the time of the kick-off meeting, however, one of the enterprises in the electric and electronic sector was unable to spare personnel because it was preparing to acquire ISO certification, and one of the food processing

Company diagnoses were implemented at each of the target enterprises, and then the enterprises, counterparts (C/P) and JICA Team collaborated in trying out Kaizen activities (quality/productivity improvement activities)<sup>2</sup> in each enterprise.

### **7.1.2 Setting of Assumptions in PP Implementation**

As was mentioned above, in implementing the pilot project, the following assumptions were set based on the findings of the fact-finding survey of enterprises and visits to industrial groups and public agencies, etc.

[Assumption 1] For the many Tunisian enterprises that depend almost totally on overseas for components and materials, through seeking to improve not only “manufacturing quality”<sup>3</sup> but also “design quality”<sup>4</sup> and “component quality”<sup>5</sup> for themselves, it will be possible to boost international competitiveness.

[Assumption 2] Without resorting to investment into new machines and equipment, many Tunisian enterprises have room to improve quality/productivity through using existing machines and equipment, and they have the potential to apply various quality/productivity improvement techniques and technologies including Japanese methods.

[Assumption 3] Enterprises that have strong commitment from top management can be expected to produce good results in the area of quality/productivity improvement too.

[Assumption 4] Setups for promoting multifaceted (comprehensive) quality/productivity improvement activities in Tunisian industry are required.

This chapter verifies these assumptions based on the experience of the pilot project and, based on the results, extracts the issues that need to be tackled in Tunisia for quality/productivity improvement and reflects them in the master plan (by making recommendations for their resolution).

### **7.1.3 JICA Project Approach (Comparison with EU Project)**

In implementing the pilot project, differences in approach with the projects of other donors especially in the EU were ascertained in advance.

Currently the EU is conducting assistance for Tunisia in the field of quality improvement. However, the approach adopted in this differs from the approach of the JICA project. The content of “quality

---

enterprises withdrew from the project because it was purchased by a foreign corporation.

<sup>2</sup> In this report, the term “Kaizen” is almost synonymous with “quality/productivity improvement.”

<sup>3</sup> Manufacturing quality: Is the planned quality reflected?

<sup>4</sup> Design quality: Are products made according to design?

<sup>5</sup> Component quality: Do they satisfy requirements as the component elements of products?



improvement assistance” in the EU project is actually support for the acquisition of ISO (International Organization for Standardization) certification. In contrast to this, the JICA project aims to assist the improvement of manufacturing quality and productivity on manufacturing lines. Whereas the contents of guidance in the EU project are based on unified international standards (concerning, for example, management systems and documentation, etc.) regardless of the enterprise, the issues tackled in the JICA project differ according to each target enterprise, so the techniques and approaches that are adopted also differ according to each issue.

These two approaches are not mutually exclusive, but rather they form a complementary relationship. In reality, a certain enterprise gained an advantage in its efforts to acquire ISO certification through taking part in the pilot project, whereas another enterprise that had already acquired ISO certification realized higher productivity thanks to the pilot project.

## **7.2 Verification of the PP Outcomes and Assumptions**

Here, the assumptions described earlier are verified based on the implementation results of the pilot project.

### **7.2.1 Assumption 1 (For the many Tunisian enterprises that depend almost totally on overseas for components and materials, through seeking to improve not only “manufacturing quality” but also “design quality” and “component quality” for themselves, it will be possible to boost international competitiveness)**

This assumption can be pre-supposed because almost all exporting Tunisian enterprises operate as subcontractors for European corporations, however, some enterprises in Tunisia are now taking actions to back it up.

Many enterprises in Tunisia are in subcontractor relationships with overseas corporations based mainly in Europe. They import components and materials from overseas and use them to assemble products for export. However, in this model, because components and product designs come from overseas, enterprises are unable to autonomously respond in the event where they receive complaints. Unless enterprises have the systems required to immediately respond to complaints, they are at a disadvantage in terms of international competitiveness. Furthermore, compared to manufacture of components and design of products, assembly-based operations entail a low added value, and enterprises can only improve their added value to a certain degree.

Having said that, some enterprises in Tunisia are challenging such limitations.

For example, some enterprises in the food processing, leather, furniture, electric and electronic and electronics (batteries, breakers, switches, transformers, ballasts, cables, refrigerators, washing machines, etc.) sectors process and manufacture components internally and are striving to improve quality levels.

Moreover, one of the pilot project enterprises internally conducts design activities and is advancing preparations to compete in international markets. This company is a maker of florescent lights; it produces many of its components internally and designs its own products while incorporating the wishes of customers. Among the enterprises that were targeted in the pilot project, this one conducted the production with the highest added value. Moreover, another enterprise that was troubled by a high rate of nonconformities in imported components was able to reduce its nonconformity rate by 80% through acquiring its own molds and manufacturing its own components. In this way there are sure signs of enterprises in Tunisia producing and processing their own components, conducting their own design activities and striving to build setups that can immediately respond to market complaints; however, the numbers of such enterprises are still small.

Thus Tunisian enterprises are becoming aware of the fact that international competitiveness can only be reinforced to a certain extent based on improvement of manufacturing quality, and that it is also important to build systems that enable design quality and component quality to be internally improved.

**7.2.2 Assumption 2 (Without resorting to investment into new machines and equipment, many Tunisian enterprises have room to improve quality/productivity through using existing machines and equipment, and they have the potential to apply various quality/productivity improvement techniques and technologies including Japanese methods)**

This assumption was demonstrated via the concrete examples indicated below. Many of the enterprises targeted in the pilot project were able to realize quality/productivity improvement while using their existing machines and equipment. It is fair to say that the Japanese style quality/productivity improvement techniques and approaches that were applied were accepted to a large degree. (See A-9 for a general summary of the implemented contents and outputs at the enterprises targeted in the pilot project).

<Case of the Electric and Electronic Sector>

In the pilot project, improvement themes were set for each model enterprise, and improvement activities were implemented using techniques deemed to be effective for each theme.

Looking at concrete examples of the Kaizen activities, an enterprise that introduced 5S realized a 20% increase in plant space and 30% improvement in productivity. A company that specializes in

producing a large variety of models in small quantities was able to reduce time loss by half through reducing its mold changeover times. A molding plant was able to discover the cause of defects and reduce its nonconformity rate from 20% to 1% upon introducing the 7 tools of QC. One-third of the enterprises that took part in the pilot project were able to show numerically expressible outputs within the pilot project period (nine months from January to October 2007). Many enterprises in Tunisia have spare capacity to improve productivity and quality without having to make investments into new plant.

Table 7-1 shows the theme-separate improvement techniques and improvement outputs that were demonstrated in the pilot project and are deemed to be valid for Tunisian industry in future. Incidentally, among the techniques that were adopted, unique Japanese group activities such as 5S and QC circles were included.

Table 7-1 Improvement Techniques deemed to be Effective for Quality/Productivity Improvement in the Tunisian Manufacturing Industry

№	Kaizen Technology (Theme)	Applied Enterprises	Main Kaizen Techniques	Level of Achievement of Kaizen Outputs		
				A	B	C
1	Layout	9	PQ analysis / Transfer distance analysis / Process proximity analysis	7	1	1
2	Operation man-hours balance	7	Operation man-hours balance analysis	6	1	
3	Shortening of set-up times	3	Single set-up (SMED)	2	1	
4	5S	6	5S/Visual control		5	1
5	QC circles	2	7 tools of QC		1	1
6	Quality of manufacturing process	1	7 tools of QC			1
7	Quality of injection molding process	1	7 tools of QC	1		
8	Operating rate of pressing process	1	7 tools of QC		1	

[Remarks] Level of achievement of Kaizen outputs: A indicates enterprises where concrete (quantitative) quality/productivity improvement was confirmed during the PP period; B indicates enterprises where concrete (quantitative) quality/productivity improvement is expected in the near future; and C indicates enterprises where Kaizen techniques were acquired only. Incidentally, the reason why totals do not number 14 is because enterprises were allowed to implement multiple Kaizen technologies (themes).

As is shown in Table 7-1, the enterprises that adopted layout and operation man-hours balance as their Kaizen themes realized a high level of achievement of Kaizen outputs. Moreover, in the plastic injection molding process and other processes that use dies, techniques for shortening set-up times led to a high level of kaizen outputs. Japanese style small-group activities such as QC circles and 5S<sup>6</sup> only showed low levels of outputs achievement, however, this was because the implementation period was

<sup>6</sup> 5S is taken from the initial letters of the words Seiri (sorting), Seiton (systematic arrangement), Seiso (sweep), Seiketsu (scrub) and Shitsuke (self-discipline) and refers to those items that must be thoroughly practiced in the manufacturing and service industries.

too short. When conducting activities such as these, it is first necessary to educate operators and raise the level of awareness towards quality/productivity. Since Kaizen techniques such as the 7 tools of QC<sup>7</sup> and so on are practically acquired one at a time after that, this takes a long time. TQM (Total Quality Management) and TPM (Total Productive Maintenance) are also company-wide activities that take a long time to produce outputs. For this reason, these technologies were not raised as Kaizen techniques in the pilot project here.

<Case of the Food Processing Sector>

The types of Kaizen techniques that are effective in Tunisia are determined according to the types of quality/productivity problems that are most commonly found there. The following problems were frequently observed in the pilot project enterprises and plants other than those targeted in the pilot project. Table 7-2 summarizes these together with the improvement techniques that were found to be effective via the pilot project activities.

Table 7-2 Relatively Common Problems and Valid Kaizen Techniques in Food Processing Enterprises

Division	Relatively Common Problems	Effective Kaizen Techniques
Quality	Lines are cluttered with unnecessary items	7S <sup>8</sup>
	Poor product shapes	7 tools of QC, design of experiments
	Intrusion of foreign materials	7S, 7 tools of QC
	Unsanitary manual work, sanitary environment	HACCP
Productivity	Long resetting times	Operation analysis, SMED, 7S
	Machine failures and long repair times	PM
	Work in progress between processes and inefficient transfer	Operation analysis, materials management analysis
	Manual operation procedures and methods entailing a lot of variation	Operation analysis

[Note] HACCP: Hazard Analysis Critical Control Point, PM: Preventive Maintenance

Two points became clear through the pilot project activities in the two sectors.

First, among the tried quality/productivity improvement techniques were distinctly Japanese techniques such as 5S and QC circles, however, in spite of differences in culture, values and thinking, a number of these techniques and technologies were transferred to the Tunisian side as shown in Tables 7-1, 7-2 and 7-3. This indicates that differences between the two countries in terms of culture and values can be overcome to a large degree according to the method of transfer and guidance.

<sup>7</sup> The 7 tools refer to Pareto diagrams, check sheets, histograms, scatter diagrams, control drawings, graphs and cause and effect diagrams. These basic tools are used to read various kinds of information from data.

<sup>8</sup> 7S is taken from the initial letters of the 5S words Seiri (sorting), Seiton (systematic arrangement), Seiso (sweep), Seiketsu (scrub) and Shitsuke (self-discipline) and adds the words of Shodoku (disinfection) and Sakkin (sterilization).

The other point is that many of the techniques and technologies used for quality/productivity improvement can be commonly applied to different sectors. Certainly the electric and electronic and food processing sectors have their own features, however, many quality/productivity improvement techniques and basic approaches such as 5S, QC circles, layout improvement, work balance and SMED are commonly applicable across different sectors.

<Transfer of techniques to the counterparts>

Table 7-3 shows the types of Kaizen technologies that the counterparts (consultants<sup>9</sup> that belong to public technical centers such as CETIME and CTAA) acquired during the pilot project and are capable of mastering by themselves in future.

Table 7-3 Improvement Technologies that the Counterparts have Acquired and Can Use in Future

Nº	Improvement Technology	Contents and Techniques of the Technology
1.	Layout improvement	PQ analysis / Transfer distance analysis / Process proximity analysis
2.	Work man-hours balance improvement	Time research (stopwatch method) / Operation research
3.	Shortening of setup times	Single setup (SMED) method / Video analysis
4.	QC circles	Analysis using the 7 tools of QC / 7 areas of waste elimination
5.	5S	Tag method / Color display / Visual control / Dividing lines

A manual was prepared during the pilot project implementation stage, however, technology center counterparts (C/P) were in charge of the above technologies and it is thought they possess sufficient theoretical understanding. In future, it is anticipated that the C/Ps educate each other and build up further experience in conducting practical diagnosis and guidance regarding the above five areas of Kaizen technology in enterprises.

### **7.2.3 Assumption 3 (Enterprises that have strong commitment from top management can be expected to produce results in the area of quality/productivity improvement too)**

This assumption can also be demonstrated through clear examples observed in the pilot project.

Electric and electronic sector enterprises that recorded good outputs in the pilot project have owners who recognized the importance of quality/productivity improvement and took a positive attitude to the pilot project (see Table 7-4). In some cases, the enterprise owners were not fully aware of

<sup>9</sup> Tunisia has eight technical centers under the Ministry of Industry, Energy and Small and Medium Enterprises (MIPME). In this study, the UGPQ is the direct counterpart, however, in reality the personnel of two technical centers, i.e. CETIME (electric and electronic and machinery sector) and CTAA (food processing sector) were mobilized. These personnel are referred to as consultants inside and outside of the technical centers.

quality/productivity improvement from the start of the pilot project. At the start, they were skeptical about the advice and suggestions made by the JICA/UGPQ (CETIME and CTAA) consultant teams and were unenthusiastic about execution, however, they adopted a more positive attitude once they understood the contents. This is evidence that enterprise owners have the desire to improve quality and productivity once they realize that it will lead to higher sales and profits. The same is true of the owners who remained skeptical until the end of the pilot project; the only difference was that the advice and suggestions provided were not enough to convince them.

Table 7-4 Kaizen Outputs in the Pilot Project

[Electric and electronic sector]		Level of Kaizen Achievement		
		A	B	C
Degree of owner's positive attitude towards Kaizen	a	6	1	
	b	3	2	1
	c			1

[Food sector]		Level of Kaizen Achievement		
		A	B	C
Degree of owner's positive attitude towards Kaizen	a	2		
	b	2	3	3
	c			3

[Source] JICA Study Team

[Note] Level of Kaizen achievement: A indicates enterprises where concrete outputs were achieved during the PP period; B indicates enterprises where c concrete outputs are expected in the near future; and C indicates enterprises where Kaizen techniques were acquired during the PP.

In the electric and electronic sector, greater Kaizen achievements were observed in small and medium enterprises during the pilot project, and this indicates that it is easier to realize quality/productivity improvements when the enterprise owner makes direct decisions and displays initiative. However, similar outputs can also be anticipated in large enterprises provided that the top management delegates authority to middle managers.

The same is true in the food processing sector. The level of commitment of business owners towards Kaizen is an important factor in determining the success of the pilot project. If supervisors feel that business owners lead from the front or that they have an interest in Kaizen and will offer support in the event of problems, they will be more motivated towards making improvements. In the food processing sector, business owners have hardly any involvement in actual management affairs irrespective of the size of the enterprise, however, in cases where top managers were delegated by owners to act as liaisons for the pilot project, it was easier to advance the project activities and realize outputs.

<Management information is biased>

The impact of a positive attitude and approach by top management on management outputs was demonstrated by the pilot project in the area of quality/productivity improvement. However, when it comes to viewing the situation from the wider perspective of reinforcing international competitiveness, there is an important issue that Tunisian enterprise owners need to tackle.

The management information that Tunisian enterprise owners need in order to make managerial decisions is biased.

In an environment of advancing globalization, enterprise owners need to make decisions based on global information; however, because the export and import trade partners of Tunisian enterprises are concentrated in specific countries (in Europe especially), the market information they have access to is also biased. For example, even though there are numerous low price and high quality components and materials available in Asia, particularly East Asia and Southeast Asia, Tunisian enterprise owners are not aware of them. If Tunisian enterprises were able to use high quality components and materials, they would be able to improve product quality and reinforce their competitiveness. There is a need to diversify sources of information.

#### **7.2.4 Assumption 4 (Setups for promoting multifaceted (comprehensive) quality/productivity improvement activities in Tunisian industry are required)**

In Tunisia, the UGPQ is an organization that promotes quality improvement across all sectors. The UGPQ was established with a five-year mandate under Ordinance No. 2101 on July 27, 2005 within the Ministry of Industry, Energy and Small and Medium Enterprises (MIPME). Its major activities currently consist of providing guidance to enterprises for acquiring ISO and HACCP certification and conducting training geared to nurturing instructors. The UGPQ is also the secretariat charged with making preparations for “Quality Week,” which has been designated as the final week of March 2008, and the “Quality Grand Prix,” whereby enterprises that display great achievements in quality improvement will be commended during the said week.

Meanwhile, concerning improvement of productivity, there is no agency that covers all sectors. The only public department responsible for productivity improvement affairs belongs to CETIME, which covers the electric and electronic sector.

The pilot project on this occasion targeted only electric and electronics and food processing but omitted all other sectors. Even in the two targeted sectors, enterprises that weren’t targeted in the pilot project have strong needs for techniques and approaches geared to improving quality and productivity, and similar needs have been confirmed in other sectors too (for example, the textile and apparel sector,

paper manufacturing sector, woodworking and furniture sector and so on); however, Tunisia does not currently possess the setup (systems or organizations) for responding to these needs.

In order to promote quality/productivity improvement across all sectors, it is desirable that fine-tuned dissemination activities be promoted. Regarding the types of dissemination activities that are available, looking at the experiences of Japanese related agencies<sup>10</sup>, the following kinds of activities are implemented<sup>11</sup>:

- Training and education regarding technology (techniques) for quality/productivity improvement
- Mobile seminars for quality/productivity improvement
- Consulting activities geared to providing support services for quality/productivity improvement
- Editing, issue and distribution of manuals, guidebooks and technical books concerning quality/productivity improvement
- Award system and qualification system for providing incentives to the acquisition of technology (techniques) concerning quality/productivity improvement
- Public information and publishing activities for quality/productivity improvement
- Collection and provision of information from important countries concerning quality/productivity improvement
- Encouragement of participation in international activities and conferences concerning quality/productivity improvement

Table7-5 shows activities deemed to be necessary for disseminating quality/productivity improvement, and it also gives the agencies that are currently engaged in quality/productivity improvement activities in Tunisia. It can be seen that organizations and agencies currently involved with quality/productivity improvement activities in Tunisia are extremely limited and consist of standardization organizations such as INORPI, agencies such as TUMAC for certifying compliance with ISO, etc., UGPQ, the technical centers in each sector, and a limited number of universities and private sector consultants.

---

10 For example, the Union of Japanese Scientists and Engineers (UJSE), Japan Productivity Center for Socio-Economic Department (JPC-SED) and the Japanese Standards Association (JSA), etc.

11 Moreover, in Japan's case, these activities have almost exclusively been implemented by private industrial groups.



Table 7-5 Required Quality/Productivity Improvement Activities and Existing Implementing Agencies

Activities targeting Private Enterprises	Organizations and Agencies Promoting the Activities on the Left	Remarks
1) Training and education regarding technology (techniques) for quality / productivity improvement (including mobile seminars)	UGPQ (mainly stages training opportunities for acquiring ISO certification, etc. Themes other than ISO are covered by the JICA project). Technical centers (TC) Private sector consultants Some universities (theoretical, not practical)	Education and training activities are the most important activities in dissemination, however, the training conducted by UGPQ is mainly linked to ISO. Agencies and organizations capable of providing guidance on quality/productivity improvement are limited.
2) Consulting activities geared to providing support services for quality / productivity improvement	Some TCs Private sector consultants	Support for enterprises is implemented based on international standards such as ISO, however, agencies and organizations capable of responding to individual enterprise issues are limited.
3) Editing, issue and distribution of manuals, guidebooks and technical books concerning quality / productivity improvement	Some TCs UGPQ (Implemented under the JICA project)	(The manual prepared in the PP should be reviewed, supplemented and corrected at regular intervals).
4) Award system and qualification system concerning quality / productivity improvement	UGPQ (Quality Grand Prix)	The Quality Grand Prix will be implemented from March 2008. Currently there is no qualification system.
5) Public information and publishing activities for quality / productivity improvement	Some TCs issue newsletters.	Quality Week will be implemented from March 2008. (Public information activities that cover multiple sectors should be expanded).
6) Collection and provision of international information concerning quality / productivity improvement techniques and trends	Implemented by some TCs?	(In future, activities that cover multiple sectors will be required).
7) Encouragement of participation in international activities and conferences concerning quality /productivity improvement	Implemented by the UGPQ and some TCs	(Participation of officials in international conferences and events should be promoted).

### 7.3 Issues Confronting Quality/Productivity Improvement

Based on the outputs of the pilot project, the issues that need to be confronted in order for Tunisian industries to expand quality/productivity improvement across all sectors can be summarized into the following four points:

- (1) Rather than simply focusing on “manufacturing quality,” how to devise ways for improving “component quality” and “design quality.” (Resolution of this issue is of utmost priority and is common to all industries concerning quality and productivity).
- (2) How to widely disseminate (to other regions and sectors) the quality/productivity improvement technologies (techniques) that were transferred to the Tunisian side (counterparts) during the pilot

project. (Issues on the side of parties responsible for conducting dissemination and parties transferring techniques, and issues concerning dissemination activities by the technical centers)

- (3) How to enhance the awareness of top managers and middle managers. (Issues on the side of parties receiving dissemination and issues concerning diversification of management information)
- (4) How to build a setup for comprehensively promoting quality/productivity improvement activities.

(1) and (3) are issues that need to be tackled by industries and enterprises (although at the moment government support is needed), whereas (2) and (4) are issues that should be tackled by the government. (2) and (3) relate to the parties responsible for conducting dissemination and parties transferring techniques as well as the parties that receive dissemination. The setup for comprehensively promoting quality/productivity improvement activities in (4) is dependent on the nurturing of (2) and (3) and the building of the environment required for their respective development. Figure 7-2 gives a simplified illustration of the relationships involved.

Moreover, although the counterparts acquired specific technologies (techniques) via the pilot project, they do not possess adequate experience in using these to conduct guidance. Accordingly, it is necessary to seek support from experts who possess rich international experience.

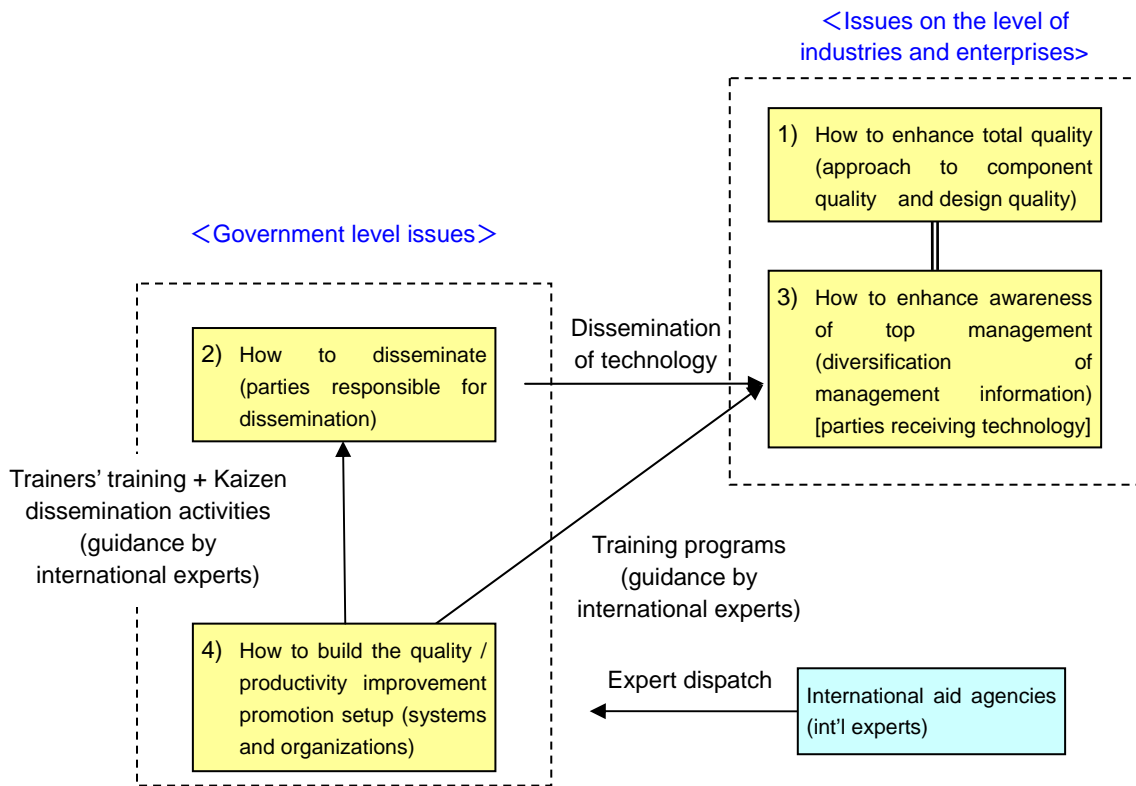


Figure 7-2 Interrelationship of the 4 Issues to be Tackled

The four issues shown above are described in greater detail below.

### **7.3.1 Reinforcement of International Competitiveness in Component Quality and Design Quality (How to Enhance Total Quality)**

In the case where a large proportion of components are imported from overseas as seen with numerous Tunisian enterprises, even if quality is improved in the manufacturing phase, it is not possible to improve the quality of components. Moreover, in cases where products are designed overseas, the Tunisian enterprises are unable to improve the design quality. Many enterprise owners seem to believe that manufacturing is the main determinant of quality, however, in reality manufacturing quality only impacts added value to a very limited degree. Generally speaking, the order of importance for determining added value is design quality, component quality, manufacturing quality; in other words manufacturing quality is the least important factor. Therefore, in order to reinforce international competitiveness via quality improvement, it is important to build setups within enterprises and inside the country that will enable component quality and design quality to be improved. Put another way, if Tunisian enterprises depend on overseas sources for components and product designs, they will be unable to make independent and prompt responses when market complaints arise. In order for Tunisian industries and enterprises to break away from their subcontracting makeup, it is important for them to develop total quality capability that covers not only manufacturing quality but also design quality, component quality and “market quality”<sup>12</sup> (if Tunisian enterprises acquire planning and design competitiveness, they will be able to develop their own unique products). Not only will this lead to reinforcement of international competitiveness, but it will also lead to higher added value.

### **7.3.2 How to Widely Disseminate Technologies (Techniques) for Quality / Productivity Improvement**

#### **7.3.2.1 Dissemination in the Two Sectors**

Technical centers in two sectors, i.e. the CETIME and CTAA counterparts, received transfer of technology (techniques and philosophy) through the project. First of all, it is important for the counterparts to transfer the acquired technologies to other consultants in the centers, and at the same time to disseminate technologies to private sector enterprises in the respective sectors via Kaizen guidance activities. A total of 27 enterprises in the two sectors of electric and electronics and food processing were able to take part in the pilot project, and it will first be necessary to instruct and disseminate technologies to the enterprises in the same sectors that couldn't take part. This type of expansion within the same sectors shall be referred to as “vertical expansion,” as opposed to the expansion to other sectors described later. The method for achieving this vertical expansion is proposed in the next section.

---

<sup>12</sup> “Market quality:” The quality demanded by consumers and users in reality. How are these needs responded to? This includes after-sales service, warranty service and the contents (quality) of responses to complaints.

### **7.3.2.2 Dissemination to Other Sectors**

It is fair to say that the counterparts (consultants in CETIME and CTAA) have the responsibility (no exaggeration to say the duty) of disseminating technologies to TC consultants in other sectors. In particular, considering that the manual compiled here can be effective for improving quality and productivity in other sectors too, great expectations are placed on the counterparts who helped with the compilation work. However, consultants in general have a prideful aversion to learning from other consultants, while consultants on the teaching side also have some resistance about teaching consultants from technical centers in different sectors. However, adopting a broad perspective, realizing the “horizontal expansion” of the technologies imparted to CETIME and CTAA in the project to the TCs of other sectors will be an important issue.

### **7.3.2.3 Manual Revisions**

When it comes to both the vertical expansion and horizontal expansion of quality/productivity improvement technologies, since the manual compiled in the project will be utilized in both production and training settings in future, it will need to be supplemented and corrected as the need arises.

Moreover, the technologies that were transferred to the Tunisian side through the project represent only a small percentage of numerous technologies that are available, and it is thought that various other technologies will be effective for Tunisia in the future. For example, it will be necessary to acquire and disseminate technologies and techniques relating to safety, inventory control, cost control and high density mounting, etc. according to the progress of industry, and in line with this it will be necessary to revise the contents of the manual.

### **7.3.3 How to Enhance the Awareness of Top Management (and Middle Managers)**

Through the pilot project and the fact-finding survey, it was reconfirmed that the depth of awareness and attitude of top management and middle management towards quality/productivity improvement determine the extent of Kaizen outputs. The top managers of the enterprises that took part in the pilot project were relatively positive in their approach, however, this is not always the case among top and middle managers in Tunisian enterprises in general.

For example, many enterprise owners regard quality to mean “manufacturing quality.” However, as was described in Section 7.3.1, quality also incorporates design quality, component quality and market quality, and there is scant awareness that industries need to acquire total quality in order to realize stronger international competitiveness and higher added value.

Moreover, many enterprise owners think that “productivity” refers to recruiting new personnel and introducing new machinery and equipment. However, a number of enterprises in the pilot project were

able to raise productivity without resorting to new investment. Therefore, before considering new investment behavior, top managers and middle managers on production lines should first work on raising quality and productivity using their existing manpower, equipment and machines.

Tunisia is scheduled to abolish all tariff barriers with the EU in 2008. Ever since the agreement was reached with the EU in 1995, tariffs have been gradually reduced and preparations made for the total abolition, and it is forecast that competition with European products will intensify as a result. However, the pilot project revealed that top managers in Tunisia have little awareness of the importance of reinforcing international competition. As globalization advances, an important issue for top managers will be the approach they take towards reinforcing international competition.

#### **7.3.4 How to Build a Setup (Organizations and Systems) for Promoting Dissemination Activities in All Sectors**

As was mentioned earlier (Section 7.2.4), only the UGPQ exists as an agency for promoting quality improvement across all industrial sectors. Although the UGPQ conducts training activities, these are limited to guidance and seminars geared to helping enterprises acquire ISO certification and so on, however, apart from explanations on the Quality Week and provision of information concerning ISO, etc., it conducts hardly any public information activities (regular publications, web page operation, etc.) or quality/productivity improvement information activities that are essential for realizing dissemination.

Furthermore, concerning promotion of productivity improvement, there are no sector-wide agencies; indeed the only organization that possesses a department specializing in productivity improvement is CETIME, which is a public technical center for a single sector.

As was mentioned earlier, in order to promote quality/productivity improvement activities across all sectors and over the whole country, it is desirable for multifaceted activities to be implemented, for example, human resources development (training and education including trainers' training), public information activities (periodicals, home page, events, etc.), awards system, qualification system, survey and research (including productivity measurements, etc.), and information collection and provision.

The UGPQ was established with the objective of improving quality across all sectors, however, it has a limited mandate and is not a permanent agency. Only CETIME in the electric and electronic and machinery sector has a specialist department for promoting productivity improvement. If Tunisia hopes to promote quality/productivity improvement activities across all sectors in future, the building of the setup for doing this will be vital. This setup may consist of a network of related agencies or it may be an independent organization. There are two broad approaches: 1) A coordinated setup (system

or network) whereby public and private agencies involved in the promotion of quality/productivity improvement activities pool their experiences, strengths and characteristics and sustain synergy based on complementing each other, or 2) An independent organization that covers all sectors, separate from the specialist agencies active in each technical field.

Many countries have a productivity headquarters or productivity centers for conducting productivity improvement activities, however, concerning quality improvement activities, there are various organizations and agencies. Even if organizations are established with the aim of working on quality or productivity, many of their activities tend to overlap as they progress. Moreover, as was ascertained in the pilot project, since Kaizen activities on production lines make no distinction between these two fields, it is desirable to construct a comprehensive setup that covers the elements of both fields that are common to all sectors. Specific recommendations are described below.

## **7.4 Recommendations for Quality/Productivity Improvement**

### **7.4.1 Recommendations for Reinforcing Total Quality Capacity**

Whether it is manufacturing quality, design quality, component quality or market quality, the responsibility for conducting improvement lies with each enterprise, and the awareness of the enterprise owner is an important factor.

However, since there are limits, both financial and technical, to capacity when viewed on the level of enterprises and industries, government support is indispensable. For example, concerning the internalization of component production, it is necessary to train and reinforce die technicians, molding technicians, quality control technicians and so on. For small and medium enterprises especially, since it is near impossible to acquire such technologies independently, it is necessary to receive technical guidance from technical center consultants or guidance and support from technical experts based on international cooperation.

The recommendations here are broadly divided into two strands: the first pertains to efforts on the industrial and enterprise level, and the second concerns efforts on the government level.

On the level of industries and enterprises, in the short to medium term the policy emphasis should be enlarged to include improvement of component quality in addition to improvement of manufacturing quality. Concerning the method adopted for realizing component quality improvement, enterprises should work on procuring good quality components or diversifying component suppliers, whereas stronger enterprises can work on internalizing components. Moving on to the medium to long term, industries and enterprises should place more emphasis on improving market quality. This incorporates products for enhancing the degree of satisfaction of customers, high quality after-sales services, rapid and pertinent responses to customer complaints, and the internalization of components for this purpose.

On the government level, efforts are required to provide indirect support for industries and enterprises based on a new setup (either a network of related agencies or a new independent organization). As was mentioned earlier, efforts to improve quality and productivity should inherently be tackled by industries and enterprises as an important area of corporate activities.

Accordingly, while industries and enterprises vigorously tackle such issues, the role of the government should be to provide indirect support only in cases where industry and enterprise efforts can only go so far, and to build an environment where industrial sectors and individual enterprises are able to acquire international competitiveness. In recommendations for the reinforcement of total quality capacity, one of the activities that should be specifically promoted by the government should be the staging of seminars and workshops for the education and training of enterprise owners. Such seminars and workshops should provide advice and practical contents geared to helping industries and enterprises tackle the themes indicated below. In order to make such seminars and workshops really effective, experts (professionals) who have ample international experience should be invited as lecturers or instructors. Such human resources probably exist within Tunisia, however, their numbers are thought to be extremely limited. Accordingly, it is recommended that such experts be secured on the international cooperation base.

Table 7-6 Recommendations for Reinforcing Total Quality Capacity

	Short-Medium Term (2009~2011)	Medium-Long Term (2012~)
Efforts on the industry and enterprise level	Priority policy: Build setups that can immediately respond to component quality on the level of industries and enterprises.	Priority policy: Build a design quality improvement setup that can immediately respond to market quality on the industrial or enterprise level.
1) Component quality steps	- Support for upgrading component quality control (training, inspection equipment, information provision) Building of setups that can immediately respond to component quality	- Promotion of component industry upgrading (technology, management, equipment, information, funding) Building of setups that can immediately respond to design quality and market quality.
2) Design quality steps	- Promotion of the localization of component design (training, inspection equipment, information provision)	- Local model development design support (technology, equipment, information, funding)
3) Market quality steps	- Support for the strengthening of quality assurance setups (training, inspection equipment, information provision)	- Support for customer satisfaction improvement activities (management, information, funding)
Government level efforts	Promotion of support for industry and enterprise efforts based on the new setup (network), and environment building for internationalization	Promotion of support for industry and enterprise efforts based on the new setup (independent organization), and environment building for internationalization
[Remarks]	Acceptance of experts with extensive international experience based on international cooperation The above industry and enterprise themes should be incorporated into training programs for business owners.	Acceptance of international experts based on invitations from industrial groups or international cooperation. The above industry and enterprise themes should be incorporated into training programs for business owners.

## (1) Component Quality Steps

### Short Term-Medium Term (2009~2011)

- Support for upgrading component quality control (training, inspection equipment, information provision)

Considering the current situation of Tunisia, it will not be immediately possible to domestically produce and internalize components that are imported mainly from EU countries. Accordingly, in the short to medium term, the key points in improving quality will be to build systems for upgrading quality control in the acceptance of purchased components so that nonconforming parts are not introduced to production lines. For this reason, first the training of human resources in the acceptance inspection department will be required. It is recommended that technical center consultants act as lecturers in this training and that the technical centers provide training and inspection equipment information to enterprises and industries. As for the training items, the following contents are considered.

- CS<sup>13</sup> mind (thorough awareness that later processes are the customer, that nonconforming products must not be passed to later processes)
- 7 tools of QC (usage of Pareto diagrams, histograms and control drawings, etc.)
- FIFO<sup>14</sup> (building systems whereby components are released to production lines in the same order that they enter stocks)

### Medium Term-Long Term (2012~)

- Promotion of component industry upgrading (technology, management, equipment, information, funding)

Tunisian enterprises will fail to reinforce international competitiveness if components currently imported from EU countries are not produced domestically or internally within enterprises in the future. So long as enterprises depend on imported components, they will not realize cost competitiveness and will not secure customer satisfaction due to inability to promptly respond to product nonconformities caused by poor component quality. Accordingly, it is recommended that support be provided in order to upgrade the component industry so that high-function components currently imported from the EU can be produced domestically within the country or internally within enterprises. Specifically, the following measures for upgrading technology in base industries and small and medium enterprises are considered:

---

<sup>13</sup> CS: Customers Satisfaction

<sup>14</sup> FIFO: First in first out



- Establishment of a Base Industry Technology Upgrading Center (for example, establish within CETIME. Initially transfer management, production and control technologies from Japan and promote dissemination).
- Policies to support technical upgrading in small and medium enterprises (implement training and plant equipment investment support measures to encourage parent companies in the EU to produce components in Tunisia (Tunisian localization)).

## (2) Design quality steps

### Short Term-Medium Term (2009~2011)

- Promotion of the localization of component design (training, inspection equipment, information provision)

The flow of product design starts from product planning and develops into design drawings, mock-ups, exterior design, mechanical design, electrical design and so on. The exterior design and mechanical design are further developed into individual component designs. Since component design is the furthest downstream element of the product design flow and can be implemented by relatively inexperienced designers, it is most realistic to start from this when implementing component design. In specific terms, as part of the above-mentioned technology upgrading support policy for small and medium enterprises, training and plant investment support should be implemented in order to encourage parent companies in Europe and so on to localize component design in Tunisia.

### Medium Term-Long Term (2012~)

- Local model development design support (technology, equipment, information, funding)

In the medium term, the localization of production design shall be promoted from the downstream to the upstream indicated in the above product design flow, while in the long term, the target shall be to localize activities from model development to product design. In addition to supporting manufacturing quality/productivity improvement, it is recommended that the technical centers implement technology, equipment and information support geared to promoting the localization of design and improvement of design quality as their medium and long-term goals. Specifically speaking, as part of the abovementioned policies to support technical upgrading in small and medium enterprises, training and plant investment support should be implemented in order to encourage parent companies in Europe and so on to localize activities from model development to product design in Tunisia.

### (3) Market quality steps

#### Short Term-Medium Term (2009~2011)

- Support for the strengthening of quality assurance setups (training, inspection equipment, information provision)

Many of the enterprises targeted in the pilot project have already acquired ISO quality certification, however, there are some enterprises where the quality assurance setups are inadequate and market return rates are high. Quality control (assurance) departments need to be established separately from manufacturing departments in order for quality assurance setups to function, however, such conditions are insufficient. Setups are required whereby appropriate cause analysis is conducted and prompt recurrence prevention measures can be implemented in response to market claims. Therefore, as the short and medium term response to market quality, it is recommended that support be provided in order to reinforce quality assurance setups. Specifically, it is recommended that technical center consultants implement training concerning quality assurance setup reinforcement and that each technical center provides training and information concerning quality assurance to enterprises and industries.

#### Medium Term-Long Term (2012~)

- Support for customer satisfaction improvement activities (management, information, funding)

Awareness of customer satisfaction (CS) is lacking not only in individual enterprises but throughout industry in general in Tunisia. As the medium and long term steps for improving market quality, it is recommended that activities geared to firmly rooting such awareness be supported. It is particularly important to thoroughly instill CS awareness into the minds of enterprise owners. If CS awareness takes root among large numbers of enterprise owners, it is anticipated that they will convey it to all levels of personnel within their enterprises and that the CS concept of regarding later processes as customers will initiate a change in thinking throughout industry overall. It is recommended that the technical centers take the initiative in conducting training geared to promoting such CS attitudes.

## **7.4.2 Continuation of Kaizen Activities and Implementation of the Trainers' Training (TT) Program (development of technical dissemination leaders)**

### **7.4.2.1 Continuation of Kaizen Activities**

Consultants who have already received transfer of technology should pass on those techniques to other consultants in the same sectors (i.e. electric and electronics and food processing), and the consultants that acquire techniques in this way should provide Kaizen guidance to enterprises in the said sectors.

This is vertical expansion. In addition, consultants should pass on techniques to the consultants of other technical centers, so that enterprises in those sectors too can receive guidance. This is horizontal expansion. Within these activities, the manual that was compiled in the pilot project stage should be utilized.

Whether it is vertical expansion or horizontal expansion, the ultimate targets are enterprises. Regarding the approach to Kaizen activities for enterprises, a certain model can be derived from the experience of the pilot project as indicated below.

First, when a technical center receives a request for Kaizen (quality/productivity improvement) guidance from an enterprise, a brief diagnosis (first enterprise visit) is conducted. Following that, the enterprise is given the assignment of collecting and analyzing data for “theme selection” by the time of the next visit. In the second visit to the enterprise, the themes are selected upon taking into account the brief diagnosis, the data analysis and conditions on the enterprise side. Following selection of the theme, a mini-seminar cum orientation is staged for the enterprise officials in order to examine the future approach to Kaizen activities. After that, the enterprise is given around two weeks to collect data necessary to implement the Kaizen activities for each theme. In the third enterprise visit, the Kaizen plan is examined and decided based on the analysis data. The enterprise implements the Kaizen plan based on the decision. The time required for this varies depending on the themes, however, between 2~4 weeks is necessary. The enterprise may be visited during this period in order to check on the state of progress. Following that the fourth enterprise visit is made in order to confirm the Kaizen outputs. Then, evaluation is made in order to bring the process to an end. In the evaluation, the consultant may give guidelines and recommendations concerning the future Kaizen activities.

This is just one model of Kaizen activities in an enterprise and is summarized in Table 7-7. This model also takes into consideration the development of counterparts by international experts.

Table 7-7 Procedure of Quality/Productivity Improvement (Kaizen) Guidance

Step	Time/Term	Step Contents	I/C	C/P	M/C
1. Brief diagnosis	** hours	Determine the purport of theme selection for quality/productivity improvement	●	○	Δ
[Assignment]	2 weeks	PQ analysis: Express the enterprise's products and production volume on a Pareto diagram.	-	-	●
2. Theme selection	** hours	Determine upon considering the brief diagnosis, PQ analysis data and conditions on the enterprise side	○	○	●
	2 hours	The J/P stages a mini seminar cum orientation for the C/Ps and enterprise officials.	●	○	○
[Assignment]	2 weeks	Instruct the necessary data analysis based on the decided theme: - In case of layout: (distance x weight or capacity) analysis - In case of man-hours balance of work: analysis of the number of process-separate operators and man-hours balance of work - In case of SMED: internal and external set-up time analysis - In case of quality nonconformity improvement: NG rates, ABC analysis of NG phenomena, stratified analysis - In case of poor operating rate: poor operating rate, ABC analysis of NG phenomena, stratified analysis	-	-	●
3. Decision of the Kaizen plan	** hours	Examination and determination of the Kaizen plan based on the analysis data	○	○	●
[Assignment]	According to the themes: 2~4 weeks	Implementation of the decided Kaizen plan	-	-	●
4. Confirmation of the Kaizen results	** hours	Confirmation of results by the Kaizen activities participants	○	●	○
5. Evaluation	** hours	Evaluation by all participants Prepare a report containing guidelines and recommendations for future kaizen activities, and present it to the enterprise.	●	●	●

[Note] Prepare based on the experience of the pilot project

PQ : Product Quality Analysis, I/C: International Consultant, C/P: Counterpart, M/C: Model Company

●: Responsible Actor, ○: Supporting Actor, Δ: Supervising Editor, Indicate the level of autonomy.

Concerning the number of visits to the enterprise, four is sufficient if things proceed smoothly, however, generally six are needed.

#### 7.4.2.2 Implementation of the Trainers' Training Program

In order to promote quality/productivity improvement activities across all industrial sectors in Tunisia, it is essential that the eight technical centers under the management of the MIPME play a role. Accordingly, it is first necessary for CETIME and CTAA, which acquired techniques and technologies in the pilot project, to transfer and disseminate this know-how to the other technical centers. This is an important point when viewed from the national perspective. However, it is forecast that difficulties will arise when CETIME and CTAA consultants attempt to instruct consultants of the other technical centers.

Accordingly, with a view to developing instructors in quality/productivity improvement from the national perspective, it is recommended that a trainers' training program be compiled and provided to public agencies. These agencies shall stage the trainers' training program with a view to securing the participation of the consultants that need to be developed. When doing this, the UGPQ should be the supervisory department overseeing the program. In that case, it will be necessary to reinforce personnel within the UGPQ.

In all of the above cases, it will be necessary to obtain support from internationally experienced experts (professionals) for program implementation. . Figure 7-3 shows the schematic diagram of this. (If the CETIME and CTAA consultants who took part in the pilot project can receive the trainers' training program, they will add to their practical experience and be able to display expert know-how regarding quality and productivity improvement even after support by the international experts has ended).

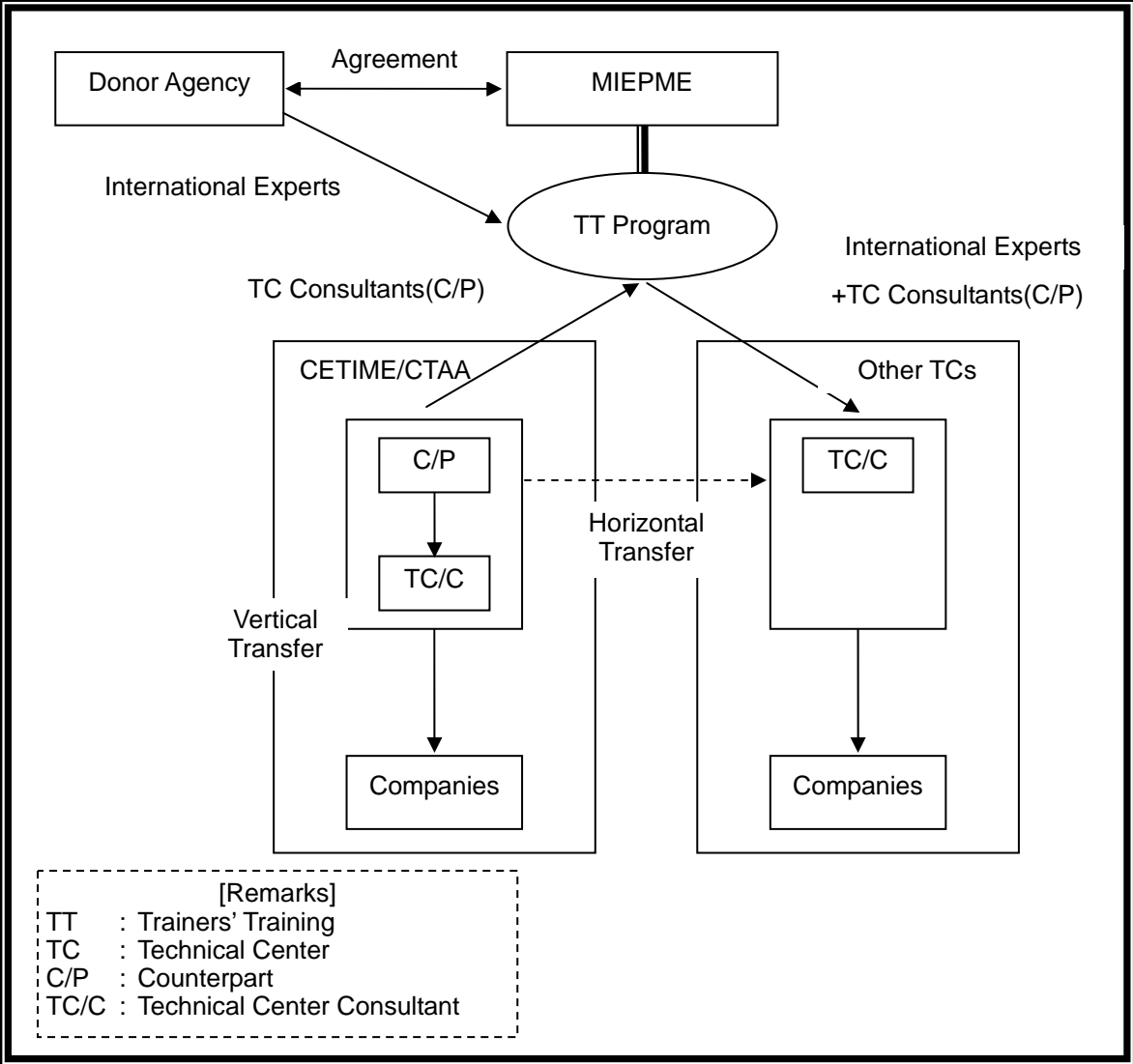


Figure 7-3 Quality/Productivity Improvement Dissemination Activities based on Trainers' Training

The manual that was prepared in the pilot project should be utilized in a number of ways: as a text when technical center consultants conduct Kaizen guidance at enterprises, as a teaching resource for teachers' training, as a reference resource in quality/productivity improvement seminars, and as a supplementary teaching resource in universities. Moreover, it is desirable that the manual undergo amendments according to the need, or that it undergoes periodic review. For this reason, it is desirable that a committee charged with editing and reviewing the manual is established in a specific department of the MIEPME or within a multi-sector agency such as the UGPQ, etc.

#### **7.4.2.3 Acquisition and Dissemination of Further Quality/Productivity Improvement Technology (Techniques)**

In the pilot project, the technologies (techniques) that were acquired by the counterparts were limited to layout improvement, man-hours balance of work, SMED, 5S, QC circles and PM, etc. Such techniques are effective for many enterprises in Tunisia at the moment. In addition, there are various other techniques that can prove useful for Tunisian enterprises in future.

In addition to the technologies acquired in the pilot project (see Tables 7-1~7-3), the Tunisian counterparts (consultants of CETIME and CTAA) should acquire other Japanese Kaizen technologies such as TPM (Total Productive Maintenance) and JIT (Just-in-Time) production systems (including the Kanban system). TPM is an indispensable Kaizen technology for quality/productivity improvement in manufacturing sectors based on mechanical equipment, while JIT is a production system that should be applied to Tunisian enterprises that produce numerous models in small quantities. However, it will be difficult to introduce this to enterprises that depend on imports for many components, and adjustments will need to be made according to actual conditions.

Concerning quality/productivity improvement diagnosis and guidance for enterprises in the electric and electronic sector, international consultants endowed with expertise should provide services (technology) in the production technology field. This field requires human resources that combine lengthy experience with theoretical know-how, and it is not possible for technical officers (counterparts) belonging to the technical centers in Tunisia to transfer the required technology in the short term. The production technologies imagined here are as indicated in Table 7-8. It will be essential for international consultants possessing specialist knowledge to provide complementary support for imparting these.

Table 7-8 Production Technologies to be Acquired for Future Quality/Productivity Improvement

No	Type of Operation	Production Technology Field	Contents of Quality/Productivity Improvement Technology
1.	Assembly	LCA <sup>15</sup> technology	(Semi) automation of assembly operations
		Surface treatment technology	Hot stamp / Printing / Plating
		Joining technology	Soldering / Ultrasonic welding / Caulking / Welding
		High density mounting technology	Technology for densely mounting electronic components onto PCB <sup>16</sup>
2.	Processing	Injection molding technology	Quality/productivity improvement of plastic injection molding parts
		Press technology	Quality/productivity improvement of press parts
		Machine processing technology	Quality/productivity improvement of machine processing parts

In these production technology fields, it is generally more difficult and requires more specialized knowledge to realize quality improvement than productivity improvement. The project counterparts (technical center consultants) are able to conduct guidance in nonconformity cause analysis methods using the 7 tools of QC, however, it is not possible to conduct guidance in nonconformity cause analysis and countermeasures without specialist know-how. Concerning the Japanese technicians that are needed in the production technology field, it is necessary to secure people who possess wide-ranging expertise and experience of line guidance. Table 7-9 summarizes the above recommendations taking into account time elements.

Table 7-9 Quality/productivity Improvement Dissemination Activities

	Short-Medium Term (2009~2011)	Medium-Long Term (2012~)
1. Continuation of Kaizen activities (vertical expansion)	Dissemination by the counterparts (C/Ps) who acquired technology via the pilot project (PP)	Promotion of Kaizen activities with C/Ps on the Tunisian side taking the initiative.
2. Implementation of trainers' training (TT) program	Transfer of technology to the consultants of other technical centers (TCs) with the cooperation of C/P who received training in the PP	Promotion of training activities with TC consultants acting as trainers
3. Utilization of manual	Utilization in Kaizen activities, TCs and universities Establish a committee to implement periodic review, supplementation and revision	Improvement of contents with the Tunisian C/Ps taking the initiative (Acceptance of international experts)
4. Expansion of quality / productivity improvement technologies (techniques) targeted for dissemination	In addition to the technologies (techniques) transferred by the C/Ps through the PP, acquire and disseminate further technologies.	Promotion of dissemination activities with the Tunisian C/Ps taking the initiative
[Remarks]	Throughout the above, accept internationally experienced expert teams under international cooperation.	Promotion of dissemination activities with the Tunisian C/Ps taking the initiative (with partial acceptance of international experts)

<sup>15</sup> Low Cost Automation

<sup>16</sup> Printed Circuit Board

### **7.4.3 Implementation of Training Programs for Top Management (training for the technology receiving side)**

Raising the awareness of top management is not an easy thing. However, through the pilot project it was confirmed that top managers in Tunisia are latently aware of the importance of quality/productivity improvement, and they are ready to take a positive attitude towards Kaizen activities providing that their real needs are addressed and their problems and concerns are listened to. Enterprise owners who were negative and skeptical about the advice and suggestions made by the consultant teams at the start of the pilot project improved their awareness as the project advanced. Accordingly, training opportunities consisting of practical seminars and workshops should be provided so that owners can improve their awareness.

Government agencies such as the UGPQ and technical centers as well as industrial groups such as UTICA and related federations should vigorously provide such opportunities. The key point will be how to secure professionals (experts) who are capable of enhancing the awareness of top managers and middle managers regarding the said themes. Although these professionals don't necessarily have to be foreigners, the only experts possessing the necessary international experience are foreign. Industrial groups may be able to invite such experts at their own expense, however, they may have trouble searching for appropriate personnel. It is likely that expectations will be placed on experts dispatched under international cooperation initiatives.

Concerning the themes of training programs, based on the contents described in Sections (Issues Confronting Quality/Productivity Improvement), (Recommendations for Reinforcing Total Quality Capacity) and (Issues for Strengthening International Competition), the following headings can be considered.

- (General) The special features of Tunisian enterprises and approaches to quality/productivity improvement (How to enhance total quality capacity)”
- “Effective techniques and philosophy of quality/productivity improvement for Tunisia”
- “Reinforcement of component processing capacity and international competitiveness” or “Reinforcement of total quality capacity and international competitiveness”
- “Diversification of industry and international competitiveness”
- “Diversification of export and procurement markets and international competitiveness”

Lecturers, as mentioned previously, shall be selected from internationally experienced experts (professionals).



The training times (or days) will be determined according to each theme. Also, individual counseling and guidance will be provided for those seeking it. Table 7-10 summarizes the contents of the above recommendations with time elements also taken into account.

Table 7-10 Implementation of Training Programs for Top Management

Targets	Short-Medium Term (2009~2011)	Medium-Long term (2012~)
Top management	Industry and enterprise activity themes for reinforcing international competitiveness (corresponding to the above themes and Table 7-6)	Industry and enterprise activity themes for reinforcing international competitiveness (corresponding to the above themes and Table 7-6)
Middle management	Practical training in production control and quality control, etc. (including some parts the same as in the training for top management)	Practical training in production control and quality control, etc. (including some parts the same as in the training for top management)
Remarks	Regarding the above activities, acceptance of internationally experienced experts under international cooperation	Acceptance of internationally experienced experts on invitation or under international cooperation

In future, maybe Tunisia should direct its attention primarily to products from Asian countries. Good quality products that are cheaper than European rivals are joining the competition in international markets (especially from China, Korea and Taiwan). Since these countries can offer cheap and high quality components, materials, equipment and machinery, etc., it is recommended that Tunisian enterprises look beyond Europe and compare economic and product information from Asia too when making management decisions.

For this reason, in addition to participating in training and seminars, enterprise owners in each sector should seek opportunities to not only “Look East” but also “Go East.” This is a rapid and effective way to reinforce international competition. At seminars that are staged in Tunisia, participants always ask “What does Tunisia need to improve in order to realize industrial development like Japan?” In the final analysis, the main disparity arises not out of differences between employees but between the demands that top managers place on employees. There is not a problem with the ability of Tunisian managers, however, the information they possess is concentrated on Europe and they do not adopt a truly international point of view. The fastest way to realize the vitalization of industries and enterprises in Tunisia will be to promote business management that is based on the diversification of information. From the viewpoint of industrial strategy too, it is necessary to install setups and organizations to promote the diversification of information in Tunisian industries and enterprises. The dissemination activities promotion setup described next should play a part in this.

#### **7.4.4 Building of the Dissemination Activities Promotion Setup (organization or system)**

As was mentioned earlier, the UGPQ is the only organization that covers multiple sectors in the area of quality. However, this organization, which was established in 2005, only has a limited mandate of five years. According to the present law, it will only continue activities until 2010. Nobody among related officials seems to have a clear idea about what will happen, however, some people think that it will remain in operation until the end of the 11<sup>th</sup> five-year plan. Here, organization and setup will be examined based on this assumption.

The proposed contents are twofold concerning the setup and organization. There is the short and medium term setup, in which the existing UGPQ plays the core role in quality/productivity improvement, and then there is the organization in the medium to long term from 2012 onwards. The short to medium term proposal aims to improve quality/productivity based on linkage between the UGPQ and related organizations and exploitation of the strengths and characteristics of each, while the medium to long term proposal seeks to establish a permanent organization for promoting quality/productivity improvement in Tunisia (this does not necessarily imply the building of a new organization).

##### **7.4.4.1 Short to Medium Term Proposal: Strengthening of Linkage for Promotion of Quality/Productivity Improvement Activities (2009~2011)**

As was mentioned in Section 7.2.4, it is desirable for Tunisia to implement the following multifaceted activities in order to promote quality/productivity improvement from now on.

- 1) Training and education for quality/productivity improvement
- 2) Consulting activities geared to providing support services for quality/productivity improvement
- 3) Editing and issue of manuals and guidebooks
- 4) Implementation of award system and qualification system concerning quality/productivity improvement
- 5) Collection and provision of international information concerning quality/productivity improvement techniques and trends
- 6) Public information and publishing activities for quality/productivity improvement
- 7) Encouragement of participation in international activities, events and conferences concerning quality/productivity improvement

As was mentioned above, Tunisia does not currently have an agency for comprehensively implementing these activities for quality/productivity improvement in private sector enterprises.

Agencies that can play a role in each area are as follows: 1) UGPQ, technical centers and universities (education contents are sometimes theoretical and lack practical applicability); 2) technical centers and private sector consultants; 3) UGPQ (under the JICA project) and some technical centers; 4) UGPQ (secretariat for the Quality Grand Prix), but nothing for qualification systems; 5) not clear what agency is systematically active; 6) technical centers and some industrial groups like UTICA issue newsletters, however, they don't actively carry commentaries or introduce case studies on quality and productivity improvement; 7) there is participation in exhibitions and so on but hardly any cases of participation in conferences and events concerning quality/productivity improvement.

In order for Tunisia to extend quality/productivity improvement activities throughout the nation, it is desirable for existing related agencies to expand their scope of responsibility, take on new activities and collaborate with each other to promote overall quality/productivity improvement activities. However, in that case it will be necessary have a central agency that has sufficient authority to coordinate the overall situation.

First, it is proposed that a supervisory department be set up inside the MIEPME in order to coordinate the responsible agencies for the abovementioned activities.

Concerning the reasons for this, CETIME and CTAA acquired quality/productivity improvement techniques and thinking in the pilot project, and although it is desirable that these agencies offer guidance to the consultants of other technical centers, in reality it is difficult for them to directly instruct other centers because they are on the same organizational level within the MIEPME. The UGPQ is thought to be appropriately placed as a supervisory agency because it covers all industrial sectors, however, it possesses no organizational authority with respect to the technical centers. Considering this, it is desirable to establish a department to supervise collaboration (network) between the various agencies concerned with quality/productivity improvement within the MIEPME, which is in charge of the technical centers.

This department should be in charge of the specific promotion of short and medium term recommendations (2009~2011) corresponding to Issues 1~3; moreover, it should be responsible for preparing the organization for promoting the recommended quality/productivity improvement activities in the medium to long term (Issue 4).

#### **7.4.4.2 Medium and Long Term Recommendation: Establishment of an Organization for Promoting Quality/Productivity Improvement Activities (2012~)**

What will happen from 2012 onwards when the UGPQ mandate expires? (In the project, it is assumed that the UGPQ will continue until 2011 – the final year of the 11<sup>th</sup> five-year plan). The following three scenarios can be considered:

- Scenario 1 : The UGPQ ends with the expiration of its mandate. There is no organization to take its place.
- Scenario 2 : A department that expands the functions of UGPQ is installed within the MIEPME.
- Scenario 3 : It is installed as an independent public organization (like a TC), and later made financially independent.

First, Scenario 1 is out of the question. 2012 will be too soon to entrust quality/productivity improvement activities to the private sector, so the government will need to maintain some role. Moreover, the government itself does not possess the capability to conduct activities alone. It is thus essential to implement activities based on international cooperation, and an organization will be needed to supervise such efforts. Accordingly, either Scenario 2 or Scenario 3 should be considered as the shape of the organization from 2012 onwards. However, Scenario 2 may also be unrealistic. Concerning why, since the MIEPME is a government office responsible for policy and guidance, when it comes to promoting concrete activities, actual operation will proceed more smoothly if the said organization is a separate entity from the MIEPME. This leaves Scenario 3 as the only available option.

The new organization would need to be independent in terms of manpower and funding like the existing technical centers, and it would need to be in a position to promote activities across all sectors. Moreover, it should aim to become a core organization for the nationwide promotion of quality/productivity improvement activities in all areas of industry including manufacturing and service sectors.

In the event where an independent organization is established based on the above Scenario 3, what kind of organization is desirable? The following diagram gives a graphical representation of the new organization based on the following assumptions: 1) know-how including operating capability of dissemination activities and Kaizen technologies are steadily accumulated during execution of the action plan over the next three years (2009~2011), and 2) the organization is developed into an independent entity with human and financial autonomy.

In specific terms, the organization should comprise the following departments: 1) Public information department (in charge of the awards system, qualifications system, public information and publishing, Quality Week, and collaboration with international agencies); 2) Training and education department (in charge of ISO seminars, quality/productivity improvement seminars, business owner seminars, and dispatches of lecturers to universities); 3) ISO certification support / Plant diagnosis services department; 4) Planning and survey department (in charge of enterprise issue surveys, development of education and training programs, and productivity measurements, etc.); and 5) Administration department (in charge of indirect services such as accounting in the new organization, liaison with other agencies, reception for seminars and plant diagnosis services).

Moreover, it is desirable to establish a Quality/Productivity Improvement Liaison Conference consisting of related agencies (the new organization, technical centers, UTICA, CSNEECF) and academic experts within the Industrial Strategy Department (DGSI) in the MIEPME. The role of this liaison conference would be to compile policy for revising manuals when it comes to developing education and training programs (for implementation in the planning and survey department), and to make policy recommendations to the government based on the enterprise issue surveys.

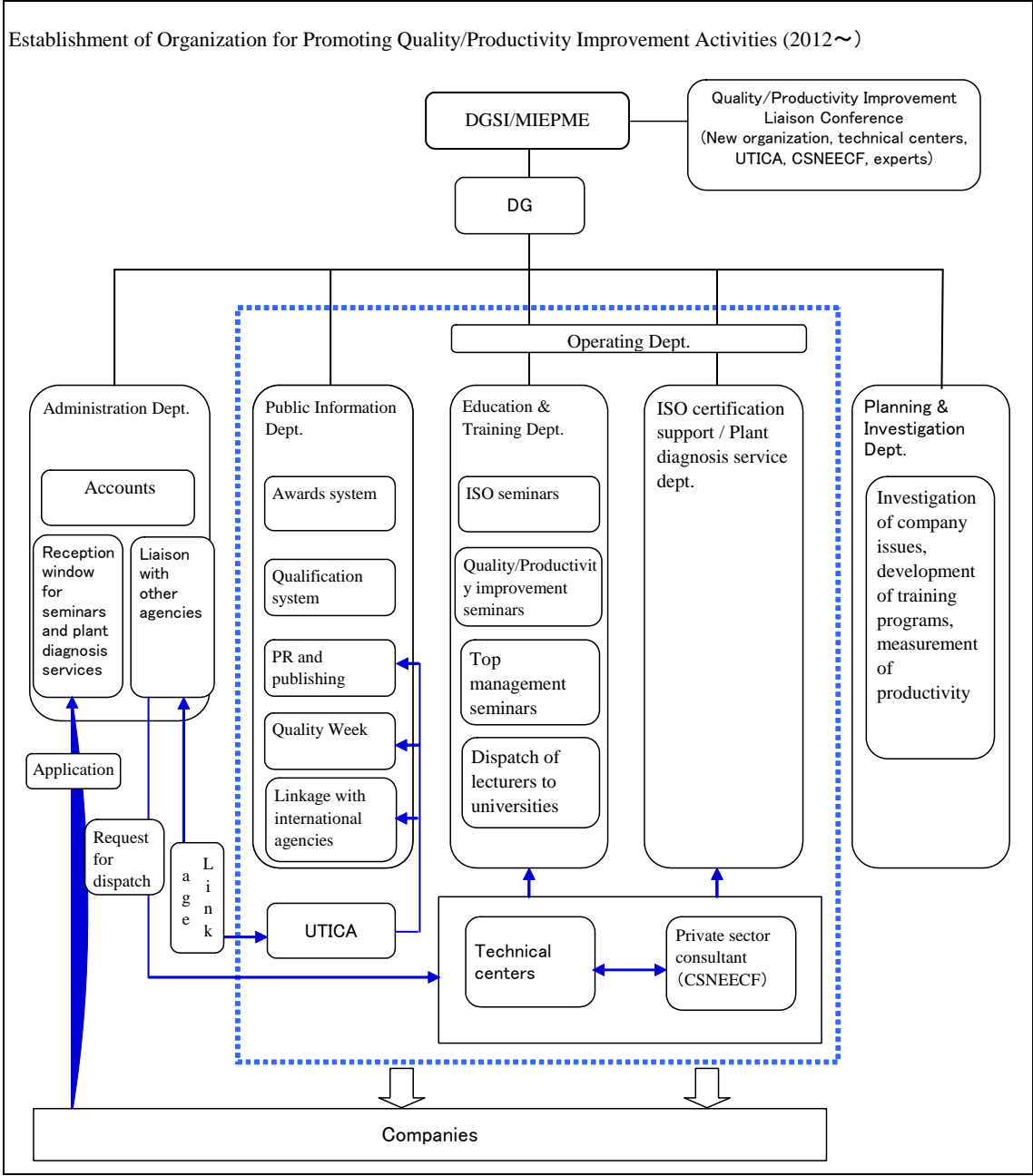


Figure 7-4 Establishment of Organization for Promoting Quality/Productivity Improvement Activities (2012-)

In specific terms, the organization should comprise the following departments: 1) Public information department (in charge of the awards system, qualifications system, public information and publishing, Quality Week, and collaboration with international agencies); 2) Training and education department (in charge of ISO seminars, quality/productivity improvement seminars, business owner seminars, and dispatches of lecturers to universities); 3) Technical support services department; 4) Planning and survey department (in charge of enterprise issue surveys, development of education and training programs, and productivity measurements, etc.); and 5) Clerical department (in charge of indirect services such as accounting in the new organization, liaison with other agencies, reception for seminars and plant diagnosis services).

Moreover, it is desirable to establish a Quality/Productivity Improvement Conference consisting of related agencies (the new organization, technical centers, UTICA, CSNEECF) and academic experts within the Industrial Strategy Department (DGSI) in the MIEPME. The role of this conference would be to compile policy for revising manuals when it comes to developing education and training programs (for implementation in the planning and survey department), and to make policy recommendations to the government based on the enterprise issue surveys.

The new organization would combine the present UGPQ functions limited to support for ISO certification with the functions to be implemented in the action plan, and it would need to maintain close links with other agencies in order for it to function smoothly. Income for the new organization would come from the operation division. The training and education department and ISO certification support / plant diagnosis services department would need to work with the technical centers and private sector consultants, while the public information department would need to collaborate with UTICA.

Assuming that the new organization described above is established<sup>17</sup>, the required personnel and equipment would be as indicated below.

Table 7-11 New Organization Setup for Promoting Quality/Productivity Improvement Activities

		Administration Dept.	Public Information Dept.	Planning & Survey Dept.	Operation Division
Personnel	Managers	1	1	1	2
	Staff	2	2	2	16
Equipment	Departments	- PCs (3)	- PCs (3)		- PCs (18) - Printer (1) - Seminar PCs, projectors (2 sets)
	Shared	- Fax machines (2), copiers (3), printers (2)			

<sup>17</sup> Considering that the new organization will oversee quality and productivity and will hopefully link with international agencies, an easy to remember name such as the “Tunisian Quality and Productivity Center” (TQPC or TUQUPROC) is considered appropriate.

Concerning personnel, the two managers in the operation division will specialize on ISO-related affairs and Kaizen activities respectively, while the two business managers should concentrate on accounting affairs and other affairs respectively. As for the 16 staff members in the operation division, one member in charge of ISO certification support and one member in charge of Kaizen activities should be assigned from each of the eight technical centers<sup>18</sup>.

For the immediate future (until the end of the 11<sup>th</sup> five-year plan in 2011), quality/productivity improvement should be sought through linking the existing related organizations, while it is desirable that establishment of an agency or organization for comprehensively supervising activities be examined from 2012 onwards. In other words, the following recommendation is made:

- (1) In the short to medium term, build linkage (networking) for the promotion of dissemination activities.
- (2) In the medium to long term, establish an independent organization for the promotion of dissemination activities.

Table 7-12 Quality/Productivity Improvement Promotion Setup

	Short-Medium Term (2009~2011)	Medium-Long Term (2012~)
1) Establishment of a setup for promoting quality / productivity improvement	Expand the activities of existing related agencies for promoting quality / productivity improvement activities, and reinforce the linkage between related agencies The Quality / Productivity Improvement Conference in the MIEPME has coordination functions and the UGPQ supports the practice of linkage activities.	Establish an independent organization for promoting multifaceted quality / productivity improvement activities under the MIEPME, and at the same time establish a liaison conference linking industry, government and academia to act as a consultative body.
[Remarks]	The Quality / Productivity Improvement Conference in the MIEPME prepares for establishment of the independent organization in the future (from 2012 onwards).	The organization will receive government support at the start, but eventually it will be a totally independent organization in terms of finances and personnel.

<sup>18</sup> The personnel assigned from the technical centers to take charge of Kaizen activities shall be trainers who have completed trainers' training.

## **APPENDICES**



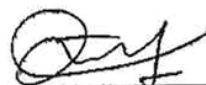
**THE SCOPE OF WORK**  
**FOR**  
**THE STUDY**  
**ON**  
**MASTER PLAN OF QUALITY/PRODUCTIVITY IMPROVEMENT**  
**IN**  
**THE REPUBLIC OF TUNISIA**  
  
**AGREED UPON BETWEEN**  
  
**THE JAPAN INTERNATIONAL COOPERATION AGENCY**  
  
**AND**  
  
**THE MINISTRY OF INDUSTRY, ENERGY AND SME's**

Tunis, 22 March 2006



---

Eizen IREI  
Resident Representative of Tunisia Office  
Japan International Cooperation Agency  
(JICA)



---

Dorsaf ZANGAR LABIDI  
Director of Quality Program Unit  
Ministry of Industry, Energy and  
Small and Medium Enterprises  
The Republic of Tunisia

## I. INTRODUCTION:

Tunisia will abolish a customs barrier by 2008 with the partnership conclusion with EU. On this account they have to improve the domestic industry that has been put with a protection policy, and to reinforce competition in the international market. They promote industrial improvement plan (Mise a Niveau) as a national project since 1995. They have recognized reinforcement of the quality/production management system and the production technology as an urgent issue of Tunisia. And national quality program unit (UGPQ) was organized as measures of the issue. UGPQ is a temporary organization that consists of the staff recommended to by technical centers which are established every industrial field. And this unit decides to assist 600 SMEs in the implementation of the quality/productivity management systems by 2010 and aims for contributing to the national objective which is 1300 companies by horizon 2009 with the ability to follow an international standard such as ISO.

Based on such a background, Tunisia government requested Japanese government to conduct the study on master plan of quality/productivity improvement including practical pilot project with staff of UGPQ.

## II. OBJECTIVES OF THE STUDY:

Japan side makes study to analyze the present conditions of the companies and business environments of food processing sector and electric industrial sector. Japan side selects about ten companies for each sector as a model and carries out a quality/productivity improvement activity together with the UGPQ staff for a model company. Based on the results of the pilot project Japan side formulates "the manual" which can be used by the UGPQ staff to conduct quality/productivity improvement activity also formulates an action plan as a policy level including the clear concept of practical use and guidance to conduct the consultation for 600 companies targeted.

### Output

- (1) To clarify issues of food processing and electric industrial sectors in the quality/productivity improvement
- (2) To improve quality/productivity of each model company by carrying out a pilot project, and to make technology transfer for quality/productivity improvement activity such as 5S, KAIZEN and Toyota Production System to Tunisia side by carrying out a pilot project together with the staff of UGPQ.
- (3) To develop a manual for quality/productivity improvement activity, the master plan and action plan to guide companies to improve quality/productivity in practical manner, using the results of a pilot project.

## III. STUDY AREA:

The Study will cover the entire area of Tunisia.

2

#### IV. SCOPE OF THE STUDY:

The study consists of local investigation and guidance in Tunisia and the work in Japan. The study is divided into the following three phases;

##### 1. The first phase

(a) To grasp the present conditions about quality/productivity improvement activity of Tunisian industry including the law and system.

- To study the law and regulations concerned with Tunisia
- To study the present condition about quality/productivity improvement activity of Tunisian industry
- To study the governmental policy about quality/productivity improvement activity

(b) To study to analyze the present conditions of company and business environment for food processing sector and electric industrial sector

- To study the supporting system in each sector of the government
- To visit SMEs in each sector and analyze their present condition and problem

(c) To select model companies and carry out a pilot project for quality/productivity improvement activity as the model company for each sector

- To set the criteria for selecting the model company
- To confirm the selecting process
- To select model companies

##### 2. The second phase

(a) To make a "tentative manual" for quality/productivity improvement activity

(b) To make the technology transfer for quality/productivity improvement activity to Tunisian side by teaching the technology and assisting Tunisian side in implementing tools in selected model companies in each sector using the tentative manual.

- To share the contents of tentative manual with Tunisian side
- To make a plan of implementation for the pilot project
- To visit the model company to diagnose and to make guidance on the quality/productivity improvement activity
- To monitor the process and evaluate the pilot project

(c) To finalize "the Manual"

- To grasp a problem of the tentative manual with Tunisian side based on results of the pilot project
- To finalize the manual with Tunisia side

##### 3. The third phase

(a) To develop master plan which includes recommendations and action plan.

- To prepare a draft of master plan

*Handwritten signature*

*Handwritten signature*

- Recommendations such as organization structure to support improving quality/productivity in Tunisia
- To prepare a draft of action plan
- Dissemination schedule of the method developed in the Study
- Sharing of the results of pilot project
- To discuss about the draft of master plan and action plan with Tunisia side
- To finalize the master plan and action plan

(b) To support and advise C/P consultants who will improve quality/productivity of the other SMEs, using the manual.

#### **V. SCHEDULE OF THE STUDY:**

The Study will be carried out in accordance with the tentative schedule as attached in the Appendix. The schedule is tentative and subject to be modified when both parties agree upon any necessity that will arise during the course of the Study.

#### **VI. REPORTS:**

JICA shall prepare and submit following reports and manual in English and French to the Government of Tunisia

##### 1. Inception Report:

Thirty (30) copies will be submitted to at the commencement of the first work period in Tunisia. This report will contain the schedule and methodology of the Study as well.

##### 2. Progress Report I:

Thirty (30) copies will be submitted at the end of the first work period in Tunisia

##### 3. Interim Report I:

Thirty (30) copies will be submitted within 2 months after second work period in Tunisia.

##### 4. Progress Report II:

Thirty (30) copies will be submitted at the end of the third work period in Tunisia

##### 5. Draft Final Report:

Thirty (30) copies will be submitted within 2 months after forth work period in Tunisia. The Government of Tunisia shall submit its comments within one (1) month after the receipt of the Draft Final Report.

7

4

021

6. Final Report:

Fifty (50) copies will be submitted within 45 days after the receipt of the comments on the Draft Final Report.

7. Manual for Quality/Productivity Improvement Activity

Fifty (50) copies will be submitted in the beginning of forth work period

**VII. UNDERTAKINGS OF THE GOVERNMENT OF TUNISIA:**

1. To facilitate the smooth conduct of the Study; the Government of Tunisia shall take necessary measures in accordance with the relevant laws and regulations of Tunisia :

(1) To permit the members of the JICA study team to enter, leave and stay in the Republic of Tunisia for the duration of their assignments therein and exempt them from foreign registration requirements and consular fees ;

(2) To exempt the members of the JICA study team from taxes, duties and any other charges on equipment, machinery, vehicles and other material brought into the Republic of Tunisia for the implementation of the Study;

(3) To exempt the members of the JICA study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the JICA study team for their services in connection with the implementation of the Study;

(4) To provide necessary facilities to the JICA study team for the remittance as well as utilization of the funds introduced into the Republic of Tunisia from Japan in connection with the implementation of the Study;

2. The Government of Tunisia shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the JICA study team.

3. Ministry of Industry, Energy and Small and Medium Enterprises, shall act as a counterpart agency to the team and also as a coordinating body with other relevant organizations for the smooth implementation of the Study, on behalf of the Government of Tunisia.

4. Ministry of Industry, Energy and Small and Medium Enterprises shall, at its own expense, provide the team with the following, in cooperation with other organizations concerned :

- Security-related information on as well as measures to ensure the safety of the Team;

np

5  
@J

- Information on as well as support in obtaining medical service;
- Available data (including maps and photographs) and information related to the Study;
- Counterpart personnel;
- Suitable office space with necessary equipment; and
- Credentials or identification cards.

#### **VIII. UNDERTAKINGS OF THE JICA:**

For the implementation of the study, JICA shall take the following measures:

1. to dispatch, as its expense, study teams to Tunisia;
2. to pursue technology transfer to the Tunisian counterpart personnel (UGPQ and enterprises in the target sector) in the course of study;
3. to arrange the necessary office equipments (computers, printers...) and the appropriate number of vehicles to facilitate the smooth conduct of the study.

#### **IX. CONFIDENCILITY:**

Confidentiality shall be kept during the implementation of the Study and the results of the study will be disclosed and opened for the public by necessary measures under the agreement between both sides.

#### **X. CONSULTATION:**

JICA and the Ministry of Industry, Energy and Small and Medium Enterprises consult with each other in respect of any matter that may arise from or in connection with the Study.

19

6

*[Handwritten signature]*

②

TENTATIVE SCHEDULE

Year	2006												2007												2008			
Month	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3				
Phase	Phase 1				Phase 2				Phase 3																			
Study		To grasp the present conditions about quality/productivity improvement activity of Tunisian industry including the law and system.	To study to analyze the present conditions of company and business environment food processing sector and electric industrial sector.		To make a "tentative manual" for quality/productivity improvement activity											To finalize "the Manual"	To make masterplan which includes recommendations and action plan											Explanation for the draft final report
Pilot Project		To implement the Quality / Productivity Improvement seminar and To set the criteria to select model companies	To select the model companies for each sector			To make the technology transfer for quality/productivity improvement activity to Tunisian side by teaching the technology and assisting Tunisian side in implementing tools in selected model companies in each sector using the tentative manual.											To give a lecture of quality/productivity improvement to other SMEs with staff Tunisia side by using the manual.											
Work in Tunisia																												
Work in Japan																												
Report		△ IC/R							△ IT/R																			
Month	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3				

IC/R : INCEPTION REPORT  
 PR/R : PROGRESS REPORT  
 IT/R : INTERIM REPORT  
 DF/R : DRAFT FINAL REPORT  
 F/R : FINAL REPORT

A-7

②

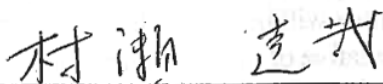
**MINUTES OF MEETING**  
**FOR**  
**THE STUDY**  
**ON**  
**QUALITY/PRODUCTIVITY IMPROVEMENT**  
**IN**  
**THE REPUBLIC OF TUNISIA**  
  
**AGREED UPON BETWEEN**  
  
**THE MINISTRY OF INDUSTRY, ENERGY AND SME's**  
  
**AND**  
  
**THE JAPAN INTERNATIONAL COOPERATION AGENCY**

Tunis, October 3, 2005

---

Dorsaf ZANGAR LABIDI  
Director of Quality Program Unit  
Ministry of Industry, Energy and  
Small and Medium Sized Enterprises  
The Republic of Tunisia



  
MURASE Tatsuya  
Head of the Project Identification Study  
Team  
Japan International Cooperation Agency  
(JICA)



In response to the request of the Government of the Republic of Tunisia (hereinafter referred to as "the Government of Tunisia"), Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Project Identification Mission (hereinafter referred to as "the Mission") headed by Mr. MURASE Tatsuya from September 17 to October 7, 2005 to clarify the framework of the study on quality/productivity improvement (hereinafter referred to as "the Study") which is set forth in the Scope of Work (hereinafter referred to as "the S/W").

As a result of discussions, JICA and Tunisian authorities agreed and confirmed the following matters for the better understanding of the S/W and for the smoother implementation of the Study.

#### 1. PROJECT TITLE

Both sides agreed that the project title of the study is "Study on Master Plan of Quality/Productivity Improvement".

#### 2. OUTPUTS

Both sides agreed that the objective of the Study is as described in the S/W, and outputs of the Study for accomplishing that objective are as follows:

- (1) To clarify issues of food processing and electric industry sectors in the quality/productivity improvement
- (2) To improve quality/productivity of each model company by carrying out a pilot project, and to make technology transfer for quality/productivity improvement activity to Tunisia side by carrying out a pilot project together with the staff of UGPQ.
- (3) To develop a manual for quality/productivity improvement activity and the master plan and action plan including the practical use method or a guidance method to companies on the basis of results of a pilot project.

#### 3. COUNTERPART

UGPQ (Quality Program Unit : Unite du Programme National de Qualite) will act as a counterpart agency as described in the S/W and both sides agreed that UGPQ will act as a main counterpart (See ANNEX III). In addition, Ministry of Industry, Energy and SME's will act as a partner on the study on quality/productivity improvement.

UGPQ and Ministry of Industry, Energy and SMEs agreed that they would allocate the necessary number of personnel.

#### 4. COORDINATION COMMITTEE

Considering the necessity of involving relevant organizations in the Study, both sides agreed that the Tunisian side would establish a Coordination Committee by the commencement of the Study for the smooth implementation of the Study and effective use of the Study results. The Coordination Committee will advise on the contents of reports submitted by JICA study team. The Coordination Committee will be chaired by the director of UGPQ. This committee will be composed of representative of organizations which are nominated by the UGPQ (See ANNEX II). UGPQ also agreed to clarify the function and its responsibility of the each member by the commencement of the Study.

#### 5. GUIDELINE FOR STUDY ON QUALITY/PRODUCTIVITY IMPROVEMENT

The Coordination Committee will define the guideline for the study on quality/productivity improvement based on Tunisian legal system.

#### 6. PILOT PROJECT

The pilot project will be implemented on the stage of phase 2. Both sides agreed that the details

AA

th

of the pilot project would be discussed between JICA study team and Tunisian side. The monitoring of the process and evaluation of the pilot project will be done by both sides.

Tunisian side requested that the number of the companies in the pilot project should be 30. JICA side explained that the number would be determined based on the availability of the budget.

Both side agreed that results of the pilot project would be disclosed for other SMEs in Tunisia.

#### 7. REPORTS

UGPQ requested that all of those reports (e.g. Inception Report, Progress Report, Interim Report, Draft Final Report and Final Report) will be prepared in English and French. Both sides agreed that in case any doubt arises in interpretation, the English text shall prevail.

Both sides agreed that Draft Final Report should be submitted to UGPQ and the Coordination Committee for clearance before publication of Final Report. Both sides also agreed that the Final Report should be open to the general public in order to share the Study results with relevant organizations as many as possible.

#### 8. LANGUAGE FOR THE OFFICIAL CORRESPONDENCE

Both sides agreed that the language to be used in the official correspondence between the Government of Tunisia and JICA study team in the course of the Study is English.

#### 9. CONFIDENTIALITY

JICA explained the basic policy on information disclosure: all the results by JICA technical cooperation projects shall be opened for the public. Tunisian side requested that the confidentiality shall be kept during the implementation of the Study and the results of the Study will be disclosed by necessary measures under the agreement between both sides. JICA agreed to convey this request to JICA headquarters for consideration.

#### 10. OFFICE SPACE AND VEHICLES

UGPQ agreed to provide adequate office space and furniture. UGPQ requested JICA that Japanese side provides the necessary office equipment. JICA agreed to convey this request to JICA headquarters for consideration.

UGPQ requested JICA that Japanese side arranges the appropriate number of vehicles. JICA agreed to convey this request to JICA headquarters for consideration.

#### 11. OTHERS

Output of the Study will be disseminated and utilized by Technical Centers to improve quality/productivity of SMEs.

Tunisian side requested that the cost of the facilities and preparations for seminars and workshops in the Study would be born by JICA.

JICA requested UGPQ to ask UTICA to be involved in the process of the selection of the pilot companies and use of the method developed by the study in SMEs.

AA

Handwritten signature

**A-2 List of Visited Company (All Sector)**

	Name of Company	Sector	Products	Employees at Regular Times	Employees at Irregular Times	Managers	Materials	Materials Source	Product Market (Export Ratio)	Foreign Capital Ratio	ISO	Mise á Niveau	Management Scope	Human Resources, Labor	Purchasing	Production	Technology	Equipment	Retailing	Customers	Marketing	STRENGTH	WEAKNESS	THREAT	Relation with Technical Centers	Problems / Issues
1	Bami	Building materials	Bricks	150	280		Clay	Local	0	0	Under construction	Utilized	○	○	○	○	○	○	-	-	-		Management		CTMCCV	Numerous injurious accidents, and unstable quality/productivity due to machine breakdowns
2	Prosami	Building materials	Bricks	150	0		Clay	Local	0	0	Under construction	Utilized	○	○	○	○	○	○	-	-	-		Management		CTMCCV	Numerous injurious accidents, and unstable quality/productivity due to machine breakdowns
3	SANCELLA	Daily necessities	Diapers, sanitary products	350	0	100	Processed resins	Imports	50%	49%	Acquired	Utilized	○	○	○	○	○	○	○	○	○	Management		Change to preferential conditions	PackTech	Improvement of quality/productivity on the international level
4	IMM	Wood furniture	Furniture	198	65-150	30	Timber, metal and resin members	Imports	0	0	Under construction	Utilized	○	○	○	○	○	○	○	○	○		Itemizing	Change in business conditions	CETIBA	Itemizing and elimination of waste from processes
5	EMA	Wood furniture	Decorative board for furniture	25	50		Timber, metal and resin members	Imports	15%	0	Acquired	Utilized	△	○	○	○	○	○	×	×	×		Quality improvement	Change in business conditions	CETIBA	Improvement in equipment operating rates and dusting of equipment
6	Stramica	Wood furniture	Decorative board for furniture	109	170	25	Timber, metal and resin members	Imports	15%	0	Acquired	Utilized	○	○	○	○	○	○	○	○	○		Itemizing	Change in business conditions	CETIBA	Reform of employee involvement, and elimination of waste from processes
7	CHEBEC	Wood furniture	Wood window frames	100			Timber	Imports	-	0	Planned in future	Utilized	△	○	○	○	○	○	×	×	×		New ventures		CETIBA	Start of production and sale of new products
8	Meublatex	Wood furniture	Furniture	1,622			Timber, metal and resin members	Imports and domestic	2%	0	Acquired	Utilized	○	○	○	○	○	○	○	○	○		Itemizing	Change in business conditions	CETIBA	Itemizing and elimination of waste from processes
9	FINZI GRAPHIQUES	Printing	Printing	60	3	7	Paper, ink	Imports	10%	0	Under construction	Utilized	○	○	○	○	○	○	○	○	○				PackTech	Reform of line manager awareness, and elimination of waste from processes
10	SOPROTIC	Leather processing	Shoes	65	121	12	Leather	Imports and domestic	100%	0	Under construction	Utilized	△	○	×	○	×	×	×	×	×			Wage hikes	CTCC	Is striving to develop unique brands but is struggling. Accumulation of production management technology
11	Jancel	Leather processing	Ladies' shoes	87	15	8	Leather	Imports and domestic	Over 10%	0	Under construction	Utilized	○	○	○	○	○	○	○	○	○			Wage hikes	CTCC	Application of added value to operations (products, markets)
12	SBA	Leather processing	Leather protective gloves	11		4	Leather	Domestic, waste materials	0	0	Acquired	Utilized	△	○	○	○	○	○	△	△	△			Wage hikes	CTCC	Resolution of materials procurement instability (currently using waste from craftsmen)
13	TOP Finition	Textile processing	Jeans, etc.										○	○	○	○	○	○	×	×	×			Wage hikes	CETTEX	
14	VTL	Textile processing	Jeans, sportswear	2,800				Imports	100%	0	Acquired	Utilized	○	○	○	○	○	○	×	×	×			Wage hikes	CETTEX	Response to competition with China and Asia and increasing labor costs
15	SIPA	Food	Bread emulsifier	20				Imports	80%	49%	Under construction	Utilized	○	○	○	○	○	○	○	○	○	Blending know-how	Management		CTAA	Customer (including technology) information control. System building for thorough enforcement of food safety and sanitation and other control.
16	MTF	Metal processing	Can	60		10		Imports	0	0	Acquired	Utilized	○	○	○	○	○	○	○	○	×				CETIME	Improvement in competitiveness and reduction of NG rates through more accurate processing
17	PAF	Metal processing	Welded steel pipes	137	73	13		Imports	A small amount to neighboring countries	0	Acquired	Utilized	○	○	○	○	○	○	○	○	○			Removal of tariffs	CETIME	Competing with imports through improving quality/productivity
18	METALLO PLASTIC	Resin processing	Dies and plastic injection molding	40-42	6-12	4		Imports	Some for export	0	Under construction	Utilized	○	○	○	○	○	○	○	○	○				CTC	Improving quality, productivity, delivery and strategically deploying dies.
19	PLASTIFOLM	Resin processing	Wrapping film	22		5		Imports	0	0	Acquired	Utilized	○	○	○	○	○	○	○	○	○				CTC	Improving quality, productivity and delivery for domestic customers
20	SIFF	Resin processing	PCV irregular shaped molds	34				Imports	0	0	Under construction	Utilized	○	○	○	○	○	○	○	○	○				CTC	Responding to domestic demand for building materials and competing with imports

### A-3 Evaluation List of Visited Companies

(These lists were approved in the Coordination Committee of November 2, 2006).

#### (Electric Industrial Sector)

No	Name of Company	Name of Sub-Sector	Principal Products	Location	Evaluation Score of selection						Questionnaire Reply (FAX)
					Importance of sub-sector	Potential of export or import replacing	Possibility of result	Motivation to improvement	Acquisition of ISO	Total	
1	COLDEQ	Electricity and Electronic Products	Refrigerator for truck	Ben Arous	2	3	5	5	5	20	OK
2	GAN (Mont Blanc)	Household Electrical Goods	Refrigerator, Washing machine	Ben Arous	4	2	4	5	5	20	OK
3	Vossloh Schwabe	Electricity and Electronic parts	Ballast, Connector	Ben Arous	3	3	4	5	5	20	OK
4	ARELEC	Electricity and Electronic parts	Connector for Power	Tunis	2	2	5	5	5	19	OK
5	NOUR	Electricity and Electronic Products	Battery	Ben Arous	3	3	4	4	5	19	OK
6	SIAME	Electricity and Electronic parts	Wireharness, cable	Nabeul	3	2	4	5	5	19	OK
7	SOMEF	Electricity and Electronic parts	Switches Socket, Breaker	Tunis	3	2	4	5	5	19	OK
8	TILC	Electricity and Electronic Products	Lighting, Conent	Tunis	3	3	4	5	4	19	OK
9	Bisma Cable	Electricity and Electronic parts	wireharness, cable, etc.	Tunis	3	2	4	5	4	18	OK
10	KACEM	Electricity and Electronic parts	Ballast, Transformer	SFAX	3	2	4	4	5	18	OK
11	SEL	Electricity and Electronic Products	Lighting Box	Sfax	3	3	4	5	3	18	OK
12	SOFTEN	Electricity and Electronic Products	Solar water heater	Nabeul	3	3	5	5	2	18	OK
13	TTI	Electricity and Electronic parts	Braker, Box	Nabeul	3	3	3	4	5	18	OK
14	ABS Electronic	Electricity and Electronic Products	TV, airconditioner	Mateur	1	3	5	5	3	17	OK
15	GIE	Electricity and Electronic Products	Ballast Conent	Tunis	2	3	3	4	5	17	OK
16	SUPER CABLES	Electricity and Electronic parts	Power cable, Telephone cable	Nabeul	2	2	3	4	5	16	
17	AFRIVISION	Electricity and Electronic Products	TV, airconditioner	Tunis	2	3	4	4	2	15	
18	ASSAD	Electricity and Electronic Products	Lead battery	Nabeul	2	3	2	3	5	15	

No	Name of Company	Name of Sub-Sector	Principal Products	Location	Evaluation Score of selection						Questionnaire Reply (FAX)
					Importance of sub-sector	Potential of export or import replacing	Possibility of result	Motivation to improvement	Acquisition of ISO	Total	
19	Stiel	Electricity and Electronic Products	Switches, Socket, Concent	Chargula	2	4	2	2	5	15	OK
20	Chakira Cable	Electricity and Electronic parts	Cable	Tunis	3	4	1	1	5	14	
21	Coficab	Electricity and Electronic parts	Cable for Car	Tunis	3	4	1	1	5	14	
22	CTE El Athir	Electricity and Electronic Products	Color TV, PCB assembly	Tunis	2	1	3	3	5	14	
23	Eleman	Electricity and Electronic parts	PCB Assembly	Manouba	1	4	2	2	5	14	
24	SEP	Electricity and Electronic parts	PCB Assembly	Kantaoui	2	2	3	3	4	14	
25	Tunisie Cables	Electricity and Electronic parts	Power cable, Telephone cable	Nabeul	2	2	2	3	5	14	OK
26	Electrostr	Electricity and Electronic Products	Refrigerator, Washing Machine, TV	Tunis	1	2	2	3	5	13	
27	Tunisie Electro Technique	Electricity and Electronic Products	Power distributor	Tunis	2	2	1	3	5	13	
28	OMNIACOM	Electricity and Electronic Products	Softwear, for communication	Ariana	2	2	1	2	5	12	
29	SACEM	Electricity and Electronic Products	Transformer for Power	Bizerte	2	1	1	3	5	12	OK
30	SOTECA	Electricity and Electronic Products	Power Controler	SFAX	2	1	3	3	3	12	OK
31	SOTACER	Household Electrical Goods	refrigerator, Washing machine, Air conditioner	Tunis	2	2	3	3	1	11	OK
32	ABS Electro	Electricity and Electronic Products	Refrigerator, Washing Machine, Gass table	Menzel Bourguiba	1	1	2	3	3	10	
33	SOTUPILE / ENOVE	Electricity and Electronic Products	Dry Battery, Industry Battery	Zaghouan	2	2	2	3	1	10	
34	Global Lighting	Electricity and Electronic Products	Economy Lump, Standard Lump	Kairouan	1	1	2	2	1	7	

**(Food Processing Sector)**

No	Name of company	Name of sub-sector	Principal Products	Location	Evaluation score of selection						Questionnaire Reply (FAX)
					Importance of sub-sector	Potential of export or import replacing	Possibility of result	Motivation to improvemet	Acquisition of ISO	Total	
1	Huilerier Loued	Oil	Olive oil	Chibika	5	5	4	5	3	<b>22</b>	OK
2	L'Appetissante	Confectionary	Biscuit, wafer	Tunis	5	4	4	3	5	<b>21</b>	OK
3	La Générale Alimentaire JOUDA	Vegetable processing	Tomato paste, harissa	El Baten	4	4	4	4	5	<b>21</b>	OK
4	Confiserie Triki -Le Moulin	Confectionary	Candy, gum, shamia	Sfax	4	4	4	4	5	<b>21</b>	OK
5	S.C.A.P.C.B.	Vegetable processing	Tomate paste, harissa, pickled kidny bean, pickled olive, garlic patty	Grombalia	4	4	3	4	5	<b>21</b>	OK
6	SNBG	Drink	Fruit juice, carbonated beverage	Grombalia	3	4	4	4	5	<b>20</b>	OK
7	VACPA	Preserve	Dates	Ben Khalled	2	4	4	5	5	<b>20</b>	OK
8	Fromagerie SCANDI	Dairy product	Cheese	La Soukra	3	3	4	4	5	<b>19</b>	NO
9	El Mazraa	Meat	Turky meat, chicken meat, sausage, catering(delicatessen)	Nabeul	3	2	4	4	5	<b>18</b>	OK
10	ABCO	Fish processing	Canned tuna, canned sardine	Sidi Daoud	3	3	3	4	5	<b>18</b>	OK
11	Medina	Vegetable processing	Artichoke, dried tomato, grilled salad	ZI de Jedeida	3	4	4	4	3	<b>18</b>	OK
12	Sipa	Conditioning agent	Conditioning agent for bread and cake	Bizerte	2	5	4	4	3	<b>18</b>	OK
13	CVBA	Winery	Wine	Bouargoub	3	4	3	4	3	<b>17</b>	OK
14	Med Agro Ruspina	Oil	Olive oil	Moknine	5	5	3	2	1	<b>16</b>	OK
15	Mouna Food	Vegetable processing	Salad in bottle	Mhemdia	3	4	4	3	2	<b>16</b>	OK
16	Phytoflora Lassonde	Drink	Mix juice, lemon juice, orange juice	Sahiline	3	4	3	2	3	15	-

No	Name of company	Name of sub-sector	Principal Products	Location	Evaluation score of selection						Questionnaire Reply (FAX)
					Importance of sub-sector	Potential of export or import replacing	Possibility of result	Motivation to improvement	Acquisition of ISO	Total	
17	SLD (Beldi MED SA)	Dairy product	Milk, yogurt, cheese, butter	Manpouba	2	2	3	3	5	15	-
18	S.I. Tunisie Lait	Dairy product	Milk, yogurt, cheese, butter, fresh cream	Sidi Bou Ali	2	4	2	2	5	15	-
19	U.N.P.A. Habib Mellouli & Cie	Flour milling, pasta	Pasta, wheat flour	Sousse	2	3	3	2	5	15	-
20	L' Or Liquide	Oil	Olive oil	Gabés	5	5	2	2	1	15	-
21	Sté Ben Kalia	Fish processing	Canned tuna, canned sardine	Zarzis	3	1	3	3	5	15	-
22	Manar Thon	Fish processing	Canned tuna, canned sardine	Zarzis	3	2	4	3	3	15	-
23	Tiba Foods Company	Oil	Cooking oil (olive oil, corn oil)	Ben Arous	2	4	2	2	5	15	-
24	Horchani Dattes	Preserve	Dates	Tozeur	2	4	2	2	5	15	-
25	Sopat SA	Meat	Turky meat, chicken meat, sausage	Ksor Essof	3	2	3	3	3	14	-
26	La Rose Blanche	Pasta	Pasta	Sousse	2	3	1	2	5	13	OK
27	SEEM	Drink	Mineral water, carbonated water	Chebika	2	2	3	3	3	13	-
28	SODEA	conditioning of agro-products	Fruit, vegetable	Khélidia	2	4	2	2	3	13	-
29	Sté Sathop	Oil	Cooking oil (corn oil, soy oil, coelzer oil)	Sfax	2	4	2	2	1	11	-
30	Super Huile	Oil	Cooking oil bottling	Ben Arous ZI mghira	2	2	2	2	1	9	-

#### A-4 Seminar Program 2006

08 :30 – 09 :00	<i>Enregistrement</i>	
09 :10 – 09 :40 (30 min)	<ul style="list-style-type: none"> <li>· <i>Allocution de bienvenue (Mme. Zangar)</i></li> <li>· <i>Allocution du représentant du JICA (M.Machida)</i></li> </ul>	
09 :40 – 10 :00 (20 min)	<i>L'état d'avancement de l'étude pour l'amélioration de la Qualité/productivité en Tunisie par, Monsieur Tsuyoshi KIKUCHI, Chef de la mission Japonaise</i>	
	<i>Atelier 1. Secteur électrique/électronique</i>	<i>Atelier 2. Secteur agro-alimentaire</i>
10 :05 – 10 :50 (45 min)	<i>Présentation de la situation actuelle des problèmes relatifs à la Qualité et à la Productivité dans l'industrie électrique et électronique en Tunisie, par Monsieur Kiyoshi SAKAI</i>	<i>Présentation de la situation actuelle de la situation présente et des problèmes relatifs à la Qualité et à la Productivité dans l'industrie agro-alimentaire par Monsieur Motokazu KANOKOGI</i>
10 :50 – 11 :05 (15 min)	<i>Pause café</i>	
11 :05 - 11 : 55 ( 50 min)	<i>Les approches aux solutions des problèmes relatifs à la Qualité et à la Productivité dans l'industrie électrique et électronique en Tunisie</i>	<i>Les approches aux solutions des problèmes relatifs à la Qualité et à la Productivité dans l'industrie agro-alimentaire en Tunisie</i>
12 :00 – 12 :30 (30 min)	<i>Débat et synthèse des travaux</i>	<i>Débat et synthèse des travaux</i>
12 :30 – 12 :40 (10 min)	<i>Clôture des travaux par le directeur de l'Unité de Gestion du Programme National de promotion de la Qualité, Madame Dorsaf Zangar Labidi</i>	



A-5 Invitation Card (Seminar 2006)



Invitation Card (front)



Invitation Card (rear)

**A-6 Seminar Photographs (2006)**



Opening address (Mme. Zangar)



Greetings from Mr. Machida, JICA Office Manager



View of the venue



View of the venue



Mr. Kikuchi, Team Leader



Conducted with simultaneous interpreting



6

## tive

Les premiers mois de 2006 se caractérisent par une baisse de l'offre de 2,4% ; elle est plus importante quand il s'agit des offres permanentes (supérieures à 1 an) et qui a chuté de 5,5% en 2005 contre 74 401 en 2006. Pour les offres d'embauche permanente, l'évolution est négative avec 33 580 offres en 2005 contre 35 172 actuellement. Cependant, les placements permanents ont augmenté de 6,8% (32 727 en septembre 2006 contre 30 656 en septembre 2005) et les placements temporaires de 5% (65 038 en septembre 2006 contre 61 976 en 2005), ce qui reflète l'évolution de la demande. Pour les offres temporaires, la caractéristique est la croissance soutenue de la demande. L'évolution concerne tant les offres permanentes que les offres temporaires inscrites avec une augmentation de 13% (108 501 en septembre 2006 contre 95 542 en 2005) que les offres temporaires de 10,7% (110 212 en septembre 2006 contre 99 589 en 2005).

Z.M.

rs (CEFE)

## prise

en Tunisie : malgré la mise en place des mécanismes à l'initiative privée, les promoteurs demeurent généralement informés de ces offres et ignorent tout ce qui est mis à leur disposition en ce sens. Les Mercredis de l'emploi d'entreprises dans les zones d'investissement sont loin d'être conformes aux attentes des investisseurs. Quant aux diverses ins-

### LES ECHOS DE L'INDUSTRIE

#### Energie

##### X<sup>e</sup> journées d'exploration-production pétrolière, le 30 octobre 2006

L'Entreprise tunisienne d'activités pétrolières (Etap) organise du 30 octobre au 3 novembre les X<sup>e</sup> Journées d'exploration-production pétrolière 2006 (EPC 2006). Cette manifestation qui aura lieu à Tunis (Gammarth) constitue un rendez-vous d'envergure pour les divers intervenants dans le secteur de l'énergie.

Plus de 500 participants représentant des sociétés internationales, maghrébines et nationales ainsi que les sociétés de services, des universitaires et des consultants internationaux assisteront à cette manifestation qui comprend, outre les conférences, des visites de terrain dans des réalisations pétrolières.

#### Qualité

##### Journée de partenariat avec le Jica, le 27 octobre 2006

Dans le cadre de la coopération tuniso-japonaise dans le domaine de la promotion de la qualité, l'Unité de gestion du programme de la qualité organise le 27 octobre à Tunis en collaboration avec l'Agence japonaise de coopération internationale (Jica) un séminaire d'information sur "l'étude pour l'amélioration de la qualité productive dans le secteur électrique-électronique et le secteur agroalimentaire".

Cette journée sera consacrée à la présentation de la situation actuelle des problèmes relatifs à la qualité et à la productivité dans l'industrie électrique et électronique en Tunisie et dans l'industrie agroalimentaire.

Des approches aux solutions des problèmes qui se posent dans ces secteurs seront ensuite proposées et soumises à la discussion des participants dont le nombre est estimé à 200 personnes.

#### Emballage

##### Plast Packet : un nouveau projet d'emballage bientôt opérationnel à Zaghuan

Le projet consiste en la création et la mise en service industriel d'une unité de fabrication de pièces en plastique injecté pour emballage alimentaire et autres. Les produits de cette unité seront des barquettes rectangulaires, des boîtes rondes sécurisées et des seaux de différentes dimensions et de diverses contenance pour le conditionnement des produits agroali-

mentaires et celles de distribution.

C'est dans ce contexte que les entreprises du secteur agroalimentaire ayant mis en place une démarche sécurité alimentaire selon la norme ISO 22000 ou un autre référentiel équivalent seront amenées à exiger de leurs fournisseurs d'emballage qu'ils soient fabricants de papier, de caisses en carton, de films souples, d'emballages en plastique, de barquettes, de cageots ou autres, à adhérer à la même démarche et à obtenir une certification ISO 22000.

A cet effet, le Programme de modernisation industrielle met à la disposition des entreprises du secteur de l'emballage alimentaire des missions d'assistance afin de les préparer à obtenir une telle certification de plus en plus incontournable pour préserver voire améliorer son avantage concurrentiel important aussi bien pour le marché local qu'à l'export.

#### L'étiquette tunisienne récompensée

Parmi les 4 étiquettes qui ont obtenu le prix Prestige Hélios pour l'année 2005, attribué par l'Association française pour la promotion de l'héliogravure ProHélios, figure le manchon réalisé par la société Cogitel pour le compte de Coca-Cola. Le manchon est imprimé en hélios sur un support PET thermoelectrique capable d'épouser la forme des bouteilles les plus complexes.

Ce qui offre une possibilité d'impression avec des encres spéciales ainsi qu'un reflet métallique, fluorescent et réfléchissant. Outre le maintien des qualités esthétiques, ce manchon permet l'invulnérabilité du produit grâce à un hologramme anticounterfeiting.

#### Cuir et chaussures

##### Coopération CNCC-ONUUDI

##### Séminaire sur la « Compétitivité et exportation » en décembre prochain

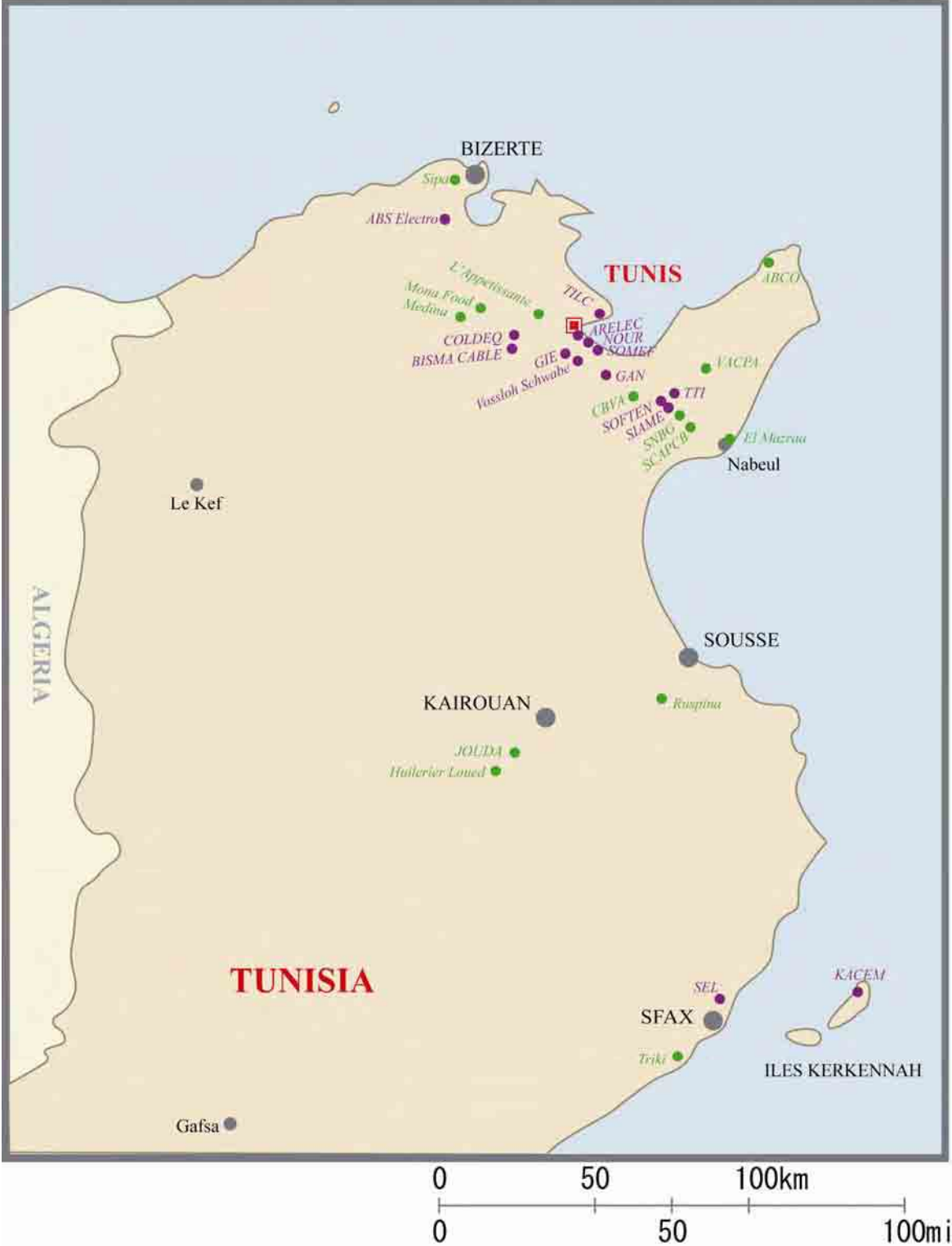
Le CNCC organisera le 20 décembre prochain, en collaboration avec l'ONUUDI, un séminaire sur le thème de « Compétitivité et exportation » afin de présenter les résultats des actions d'assistance technique pour la mise à niveau et l'amélioration de la productivité au profit des entreprises tunisiennes opérant dans le secteur ICC.

Le séminaire sera animé par deux experts internationaux qui présenteront leur propre expérience dans le domaine de la compétitivité et l'exportation avec les entreprises tunisiennes.

Ces actions d'accompagnement pour la

A-8 Distribution Map of Model Companies for Pilot Project

DISTRIBUTION MAP OF MODEL COMPANIES FOR PILOT PROJECT.



## A-9 List of PP Implementation Contents and Outputs

No.	Company	Products	Quality/Productivity Improvement Theme	Total Visits in PP	Enthusiasm for PP Activities	KAIZEN		Main KAIZEN TOOLS	KAIZEN Outputs, Comments
						Field	Achievement		
1	ABS Electronic	TVs Air conditioners	1. Plant layout improvement 2. 5S	7 times	B	P	A	Time analysis Travel distance analysis	<ul style="list-style-type: none"> <li>29in TV PCB productivity was increased by 50%</li> <li>Per capita productivity improved by 30% through reducing AC assembly line personnel (39 to 30)</li> </ul>
2	ARELEC	Connectors for power lines	1. Assembly layout improvement 2. 5S	6 times	A	P	A	Time analysis Operation analysis	<ul style="list-style-type: none"> <li>Personnel reduced by 2 through changing the assembly line flow from vertical to horizontal. Production capacity was also improved by 20-25%.</li> </ul>
3	BismaCable	Forklift harnesses	1. Plant layout improvement 2. 5S	6 times	B	P	A	Travel distance analysis	<ul style="list-style-type: none"> <li>Responding to higher production, productivity per unit area was increased by 100% through altering layout and increasing assembly boards.</li> <li>Per capita productivity increased by 11%.</li> </ul>
4	COLDEQ	Freezer trucks	1. Plant layout improvement 2. 5S	7 times	C	P/Q	C	Travel distance analysis	<ul style="list-style-type: none"> <li>It was decided to implement layout improvement.</li> <li>A visual control board was made.</li> </ul>
5	GAN(MontBlanc)	Refrigerators	1. Improvement of injection molding process 2. Assembly layout improvement	5 times	B	P	A	SMED Distance analysis Operation analysis	<ul style="list-style-type: none"> <li>Injection molding set-up time was shortened by 60%. (Before improvement: 100 minutes→After: 40 minutes)</li> <li>Refrigerator assembly production capacity increased by 20-25%.</li> </ul>
6	GIE	Lighting fixtures	1. Assembly productivity improvement 2. Improvement of injection molding process	7 times	A	P/Q	A	Travel distance analysis SMED	<ul style="list-style-type: none"> <li>An assembly process layout improvement plan was prepared.</li> <li>Injection molding set-up time was shortened by 36%. (Before improvement: 110 minutes→After: 70 minutes)</li> </ul>
7	KACEM	Ballasts, transformers	1. Assembly layout improvement 2. 5S	7 times	A	P	A	Travel distance analysis 5S	<ul style="list-style-type: none"> <li>Productivity per unit area was increased by 20-25% through changing layout. At the same time, 5S were implemented and the plant was made much cleaner and tidier.</li> </ul>
8	NOUR	Batteries	1. Assembly process quality improvement 2. Set-up time shortening	6 times	B	Q	C	7 tools of QC	<ul style="list-style-type: none"> <li>Analysis of quality nonconformity data for batteries revealed major causes.</li> </ul>
9	SEL	Lighting fixtures	1. Welding productivity improvement	6 times	A	P	B	Travel distance analysis	<ul style="list-style-type: none"> <li>The plant was extended and is now undergoing major layout improvement.</li> </ul>
10	SIAME	Relays Watt meters	1. Improvement of injection molding process	7 times	B	P/Q	B	SMED 7 tools of QC	<ul style="list-style-type: none"> <li>Injection molding set-up time analysis, examination of countermeasures and preparation of an action plan were completed.</li> </ul>
11	SOFTEN	Solar water heaters	1. Plant layout improvement 2. 5S	7 times	A	P	A	Travel distance analysis 5S	<ul style="list-style-type: none"> <li>Responding to higher production, productivity per unit area was increased by 40% through altering layout. At the same time, 5S were implemented and the plant was made much cleaner and tidier.</li> </ul>
12	SOMEF	Switches Sockets	1. Improvement of injection molding process 2. Assembly process improvement	7 times	A	Q	A	7 tools of QC	<ul style="list-style-type: none"> <li>Nonconformity rate for important injection molding parts was reduced from 20% to 0%.</li> </ul>
13	TILC	Lighting fixtures	1. 5S + MUDA (waste) elimination activities 2. Plant layout improvement	3 times					<ul style="list-style-type: none"> <li>Dropped from the PP in the 3rd FS</li> </ul>
14	TTI	Electromagnetic switches (MCB)	1. QC circle + MUDA (waste) elimination activities	6 times	A	P	A	Time analysis Operation analysis	<ul style="list-style-type: none"> <li>Riveting personnel for PLS (the mainstay product) were cut from 6 to 3.</li> </ul>
15	Vossloh Schawabe	Ballasts, transformers	Q66 processing line productivity improvement	7 times	B	P	B	7 tools of QC	<ul style="list-style-type: none"> <li>Data on operating rate during the PP implementation period revealed a trend of increase in the Q66 line.</li> </ul>

A : Active participation by top management  
B : Participation by PP personnel and related staff  
C : Almost participation by the PP personnel only

P : Productivity  
Q : Quality  
P/Q : Productivity/Quality

A : Concrete KAIZEN outputs are recognized.  
B : Concrete KAIZEN outputs can be expected in future.  
C : KAIZEN techniques were acquired.

No.	Company	Products	Quality/Productivity Improvement Theme	Total Visits in PP	Enthusiasm for PP Activities	KAIZEN		Main KAIZEN TOOLS	KAIZEN Outputs and Comments
						Field	Achievement		
1	Huilerier Loued	Huile d'olive	1.Thorough enforcement of hygiene control fundamentals	6	B	Q	B	·5S(3S)	·The company aims to acquire ISO next year and regards the introduction of 3S as preparation for this, under instructions from the company owner.
2	L'Appétissante	Biscuits	1.Reduction of losses caused by quality defects 2.Prevention of infiltration of foreign objects	5					·Dropped out at the request of the company
3	La Générale Alimentaire JOUDA	Purée de tomates, harissa	1.Improvement of efficiency of energy use 2.Thorough enforcement of hygiene control fundamentals	7	C	P/Q	C	·7 tools of QC ·5S(3S)	·Although a plan for reducing tomato washing water was presented, discussion failed to advance because the company was busy with plant repairs.
4	Confiserie Triki-Le Moulin	Confiserie chewing gum, gateaux tunisiens	1.Reduction of nonconformities in manufacturing 2.Shortening of retooling time 3.Thorough enforcement of hygiene control fundamentals	7	B	P/Q	C+	·7 tools of QC	·Since this is an integrated device plant with diverse processing conditions, it is difficult to directly gauge nonconformities and their causes. ·Meanwhile, analysis techniques and data collection awareness on the company side increased via the PP.
5	S.C.A.P.C.B.	Purée de tomates, harissa	1.Improvement of machine operating rates 2.Rust prevention of cans 3.Improvement of organized productivity	7	B+	P	B	·Maintenance of main machinery ·Improvement of in-house communications	·The company is satisfied with its acquisition of techniques, e.g. self-diagnosis capacity. ·Causes of the rust problem in cans lie not only in the company's manufacturing line but also the can making company. In future, can measures will need to be discussed with input from a doctor.
6	SNBG	jus	1.Improvement of machine operating rates 2.Thorough enforcement of hygiene control fundamentals	8	A	P	A	·PQ analysis ·5S	·Following layout improvement, product travel distances (by forklift) were greatly reduced. Also, it appears that picking work, replacing trolley work, will be greatly improved ·It is planned to implement a series of improvement in October, when product stores go down. Work in the three other product stores will be improved upon viewing the results.
7	VACPA	Dattes	1.Improvement in long-term storage of raw materials 2.Improvement of human productivity	8	A	P/Q	A	·Work time analysis ·Operation analysis	·In the packaging process, through introducing small groups, productivity was improved by reducing idle time and overload losses arising from fluctuations in net task times. ·In October, the roller conveyor required for this was introduced and 4 small groups were formed. (Productivity improvement of 25-30% can be anticipated).
8	El Mazraa	Viande de pouket et de dinde	1.Improvement of human productivity	6	C	P	C	·Operation analysis ·Improvement of packaging process	·Packaging machines for resolving bottleneck processes are under investigation. ·Active involvement and research into productivity improvement by top management is commendable.
9	ABCO	thon et daardines a l'huile eb boite	1.Improvement of human and equipment productivity rates	7	B	P	B	·Operation analysis	·The responsible manager is very enthusiastic and conducts avid research, and certain results were realized in terms of transfer of technology of self-diagnosis techniques. ·Based on this side's proposals, improvement of line design is underway.
10	Medina	Salade grillée	1.Improvement of human productivity	6	B	P	C	·PQ analysis ·Operation analysis	·It was decided to introduce trolleys for moving work in progress between processes. Currently, the structure of existing trolleys is under examination.
11	Sipa	Agents de conditionnement	1.Thorough enforcement of hygiene control fundamentals	7	B+	P/Q	A	·FIFO ·5S(3S)	·Active implementation of 5S (3S) in spite of having a plant relocation plan is commendable. The company plans to introduce the same 5S (3S) at the new plant.
12	CVBA	Vin	1.Thorough enforcement of hygiene control fundamentals 2.Shortening of retooling time	7	B	P	C	·7 tools of QC	·The company owner tends to persist with his own ideas regarding problems and issues, however, he is impressed with the transfer of issue analysis methods via the PP. ·However, 5S (3S) implementation has failed to progress beyond application of red tags, and the lack of enthusiasm is unfortunate.
13	Med Agro Ruspina	Huile d'olive	1.Improvement of human and equipment productivity rates	7	B+	P/Q	A	·5S(3S)	·3S have been introduced on manufacturing lines and materials and products stores, and the plant has reached a level that can satisfy even visits by overseas buyers.
14	Mouna Food	Salade grillée	1.Improvement of productivity 2.Prevention of infiltration of foreign objects	7	C	P/Q	C	·Operation analysis	·The company is considering introduction of an automatic baking machine on the green pepper baking process, where production is rising.

A : Participation des propriétaires et / ou des PDG des entreprises  
B : Participation des responsables des départements et homologues coté entreprise du PP  
C : Participation des homologues coté entreprise du PP uniquement.

P : Productivité  
Q : Qualité  
P/Q : Productivité / Qualité

A : Constatation concrète d'une « amélioration de la Qualité et/ou Productivité »  
B : Existence de perspectives de résultats concrets dans un proche avenir  
C : Acquisition des méthodes d'autodiagnostic / amélioration pour

## A-10 Seminar Program (2007)

Le 22 Novembre 2007 – Hôtel Africa Tunis

Heure	Salle de Séminaire Malawi	
08:30- 09 :00	Acceul et inscription	
09:00- 09 :05	Allocution de bienvenue de Mme. Dorsaf ZANGAR LABIDI, Directrice de l'UGPQ	
09:05- 09 :20	Allocution du représentant résident de la JICA Tunis M. Satoshi MACHIDA	
09:20- 09:35	Présentation du « Projet Pilote pour l'amélioration de la qualité/Productivité dans les entreprises tunisiennes » par Mme. Dorsaf ZANGAR LABIDI, directrice de l'UGPQ	
09:35- 10:00	« L'amélioration de la qualité/Productivité au Japon » par M. Kiyoshi SAKAI, expert JICA	
10:00- 10:30	Pause café	
	Atelier 1 (Salled Malawi) Secteur électrique/électronique	Atelier 2. (Salle Zambeze) Secteur agro-alimentaire
10:30- 11:00	Témoignage de l'entreprise SOMEF (Commutateur) : par M. BEN SALEM	Témoignage de l'entreprise SNBG (Boissons) : par M. MTISAOUI AYMEN
11:00- 11:30	Témoignage de l'entreprise SOFTEN (Chauffe-eau solaire) : par Mlle. EYA OUESLATI	Témoignage de l'entreprise VACPA (Dattes-Conserves) : par M. M'NAOUAR HMDI
11:30- 12:00	* Présentation du manuel d'amélioration de la qualité/productivité (Secteur Electrique) : Mme. Affifa OUMAYA, consultant CETIME	* Présentation du manuel d'amélioration de la qualité/productivité (Secteur Agroalimentaire) : M. Anis MAHJOUB GAIDA, consultant CTAA
	Salle de Séminaire Malawi	
12:00- 12:15	Questions et réponses	
12:15- 12:30	Clôture du Séminaire par M. Tsuyoshi KIKUCHI, Expert et chef de l'équipe JICA	

Le 04 Décembre 2007 – Hôtel Mercure Sfax

Heure	Salle de Séminaire Carthage 4	
08:30- 09 :00	Acceul et inscription	
09:00- 09 :05	Allocution de bienvenue de Mme. Dorsaf ZANGAR LABIDI, Directrice de l'UGPQ	
09:05- 09 :20	Allocution du représentant résident de la JICA Tunis M. Satoshi MACHIDA	
09:20- 09:35	Présentation du « Projet Pilote pour l'amélioration de la qualité/Productivité dans les entreprises tunisiennes » par Mme. Dorsaf ZANGAR LABIDI, directrice de l'UGPQ	
09:35- 10:00	« L'amélioration de la qualité/Productivité au Japon » par M. Kiyoshi SAKAI, expert JICA	
10:00- 10:30	Pause café	
10:30- 11:00	Témoignage de l'entreprise : KACEM (Transformateurs, ballasts) par M. Mohamed KACEM	
11:00- 11:30	Témoignage de l'entreprise : RUSPINA (Huile d'olive) par Mohamed TURKI	
11:30- 12:15	* Présentation du manuel d'amélioration de la qualité/productivité (Secteur Electrique) : Mme. Affifa OUMAYA, consultant CETIME * Présentation du manuel d'amélioration de la qualité/productivité (Secteur Agroalimentaire) : M. Anis MAHJOUB GAIDA, consultant CTAA	
12:00- 12:15	- Questions et réponses	
12:15- 12:30	Clôture du Séminaire par M. Tsuyoshi KIKUCHI, Expert et chef de l'équipe JICA	

## A-11 Invitation Card (Seminar 2007)



Invitation Card (front)



Invitation Card (rear)



**A-12 Seminar Photographs (2007)**



Opening address (Mme. Zangar)



Greetings from Mr. Machida, JICA Office Manager



Mr. Kikuchi, Team Leader



View of the venue



View of the venue




Expert Mr. Sakai

**A-13 Minutes of Meeting (Signed on May 5, 2008)**

MINUTES OF MEETING  
ON  
SUBMISSION OF DRAFT FINAL REPORT  
FOR  
THE STUDY  
ON  
MASTER PLAN FOR QUALITY/PRODUCTIVITY IMPROVEMENT  
IN  
THE REPUBLIC OF TUNISIA  
AGREED UPON BETWEEN  
QUALITY PROGRAM UNIT  
OF  
THE MINISTRY OF INDUSTRY, ENERGY AND SME  
AND  
JICA STUDY TEAM

TUNIS  
20<sup>th</sup> May 2008

  
Ms. Dorsaf Zangar Labidi  
Director of Quality Program Unit  
Ministry of Industry, Energy and  
Small and Medium Enterprises.

  
Mr. Tsuyoshi Kikuchi  
Team Leader  
JICA Study Team

## Introduction

The JICA Study Team has prepared the Draft Final Report concerning *the Study on Master Plan for Quality/Productivity Improvement in the Republic of Tunisia* which started on August 2006 and submitted it to the Coordination Committee which was held on 20<sup>th</sup> May 2008 at the Ministry of Industry, Energy and SME for their approval.

At the result of the Meeting, the Report including Master Plan was principally approved by participants with some comments and corrections agreed by JICA Study Team which should be taken into consideration in finalizing the Draft Final Report.

Attached are the proceedings of the Meeting with the JICA Study Team, UGPQ/MIEPME officials, the other relevant government officials and the representatives of the private sector.

PROCEEDINGS OF THE COORDINATION COMMITTEE MEETING ON THE STUDY ON MASTER PLAN FOR QUALITY/PRODUCTIVITY IMPROVEMENT HELD AT THE MEETING ROOM OF THE MINISTRY OF INDUSTRY, ENERGY AND SME BUILDING ON 20TH MAY 2008.

**1. Agenda of the Meeting**

**1.1. Briefing on the Draft Final Report**

**1.2. Comments from Participants**

**2. Proceedings:**

The meeting was called to order at 3:30 p.m. and chaired by Mme Dorsaf Zangar Labidi, Director of UGPQ.

Members of JICA Mission from Headquarter (Tokyo) and representatives of JICA Tunis office were introduced to all participants. (The names of all participants are listed up at last page of this Document.)

**2.1. Briefing on the Draft Final Report**

After the Director of UGPQ explained the background and the objectives of the Meeting to the participants, Mr. Tsuyoshi Kikuchi, the Team Leader for the JICA Study Team, presented the Draft Final Report to the meeting with presentation materials in addition to the Report, and the Report was accepted with some comments and corrections which should be taken into the Draft Final Report. The comments are mentioned hereafter.

The highlights of his presentation are as follows:

- (1) Issues and Recommendations for Improvement of Quality/Productivity (Chapter 3 of Draft Final Report [Master Plan Edition])
- (2) Action Plan for Dissemination of Quality/Productivity Improvement Activities (Chapter 4 of Draft Final Report [Master Plan Edition])

**2.2. Comments from Participants**

After briefing of the Draft Final Report by the JICA Study Team leader, the following comments were made by the participants. The leader mentioned that those comments will be taken into consideration in preparation of the Final Report.

- (1) Some terms are not properly translated in the French edition of the Draft Final Report.

- (2) Specific names of interviewees should be deleted in the Master Plan edition.
- (3) International experts are required to implement recommendations proposed in the Mater Plan within the framework of a new project.
- (4) Evaluation upon implementation of the proposed recommendation relating to the *Short to Medium Term Proposal: Strengthening of Linkage for Promotion of the Quality/Productivity Improvement Activities (2009~2011)* should be made before implementation of the *Medium to Long Term Proposal: Establishment of an Organization for Promotion of the Quality/Productivity Improvement Activities (2012~)*.
- (5) Overlapping of activities of existing organizations/institutions with those of the newly proposed organization to be created in the medium to long term proposal should be avoided.
- (6) Participants in the Coordination Committee stressed on continuing working along side with JICA's technical assistance for Quality/Productivity Implementation in Tunisia.

JICA Study Team agreed that the above comments should be taken into consideration in the preparation of the Final Report.

Mme Dorsaf Zangar Labidi, Director of UGPQ mentioned that any other comments from participants would be accepted by tomorrow (21<sup>st</sup> May) , and proposed that further detailed correction task, if any, should be entrusted to the Director and the Study Team Leader after their discussion. All participants agreed with her proposal.

**PARTICIPANTS LIST OF COORDINATION COMMITTEE**

(Please write down in BROCK LETTER. Thank you!)

on 20th of May, 2008

at MIEPME

	NAME	ESTABLISHMENT	SIGNATURE
1	Agrebi Noufeddine	Ministry of Industry	
2	Babai Slim	Ministry of Industry	
3	BELGAIED Hamida	Ministry of Industry	
4	BouZOUADA Amor	" " "	
5	Gaida Mahjoub Anis	CTAA	
6	Abdellatif AROUD	UTICA DCE	
7	FERCHICHI Ezzeddine	UGPP/Dim. Ind	
8	M <sup>me</sup> Ramzi EL Methamem	CETIME	
9	CHEBBI Mohamed	CETIME	
10	Dorsaf Zaouar Jebeli	UGPP/MIEPME	
11	Hammouch Gregzeg	DGSI/MIEPME	
12	Amor BOUCHIBA	FEDLEC/UTICA	
13	Kakuzen Yodo	JICA Tunis	
14	ABE Hirovuki	JICA HQ	
15	KUBO Eiji	JICA HQ	
16	SAITO, Yukari	JICA HQ	
17	KINSHIKO KATO	JICA STUDY TEAM	
18	Shuichi TAKANO	JICA Study Team	
19	Kato Yuji	JICA Study Team	
20	Yuichi FUKUSHIMA	JICA study Team	
21	Romdhani Fekria	MIEPME / DGSI	
22	Doufoulh Moudher	Fed. Agro / UTICA	
23	Bouzid Abdennouf	MIEPME / BCRE	
24	Tsuyoshi Kikuchi	JICA Study Team	
25	AHMED SMADLI	inter prefer	
26			
27			
28			
29			
30			

## A-14 Study Team Members

Composition of the Study Team is as follows.

Name	Field	Remarks
Tsuyoshi KIKUCHI	Team Leader	
Kimihiko KATO	Institution Building	From the second field survey, he replaced Motokazu KANOKOGI in this work.
Yuichi FUKUSHIMA	Electric Industrial Sector 1	
Kiyoshi SAKAI	Electric Industrial Sector 2	
Yuji KATO	Food Processing Sector 1	From the second field survey, he replaced Eisuke HONKAWA in this work.
Seiji SUGIMOTO	Food Processing Sector 2	
Shuichi TAKANO	Operation Coordinator	