## Islamic Republic of Mauritania

Ex-Post Evaluation of Japanese Grant Aid Project The Project for Improvement of Hygienic Examination Facilities for Fishery Products in Nouakchott (Le Projet d'Aménagement des Centres d'Examen Hygiénique de Produits Maritimes)

## External Evaluator: Machi KANEKO, Earth and Human Corporation

#### **0.** Summary

The primary objective of this project was, by rehabilitating Nouakchott Fish Market (Marché aux Poissons de Nouakchott: MPN) and constructing a Nouakchott Inspection Laboratory (Laboratoire d'Inspection de Nouakchott: LIN)<sup>1</sup>, to enforce proper handling of fishery products landed in MPN pursuant to hygiene standards of Mauritania (hereinafter referred to as "hygiene standards") and carry out hygiene inspection of those products exported to Europe. This objective has been consistent with Mauritania's development policies as well as urgent needs in Nouakchott area to strengthen the quality control system in response to an increasing fishery export. Therefore, the relevance of the project was high both at the time of the planning stage and the ex-post evaluation.

The project has enabled MPN's proper handling of fishery products in compliance with the hygiene standards of Mauritania. The export volumes for European Union (EU), which the project's indicator to assess its effectiveness, reached 3,762 tons in 2007, exceeding a target annual amount of 3,000 tons. LIN is also properly operated in issuing sanitary certificates of exportable fishery products and accrediting fish processing factories. In 2009, the laboratory undertook more than 4,000 cases of testing and inspections of fishery products, exceeding the project's target value. Not only contributed to the local economy of Nouakchott, an increase in the fishery exports has benefited small-scale fishers, dealers and retailers, making a positive impact on living conditions of these end beneficiaries. Therefore, the effectiveness and impact of the project are high.

The project cost and period are both within planned values, therefore its efficiency is also high. As for its sustainability, while LIN properly operates and maintains its facilities, MPN has some problems in facility maintenance, including a technician's ability in checkup and repair of equipment. Thus, the sustainability of the project effect is fair.

In light of the above, this project is evaluated to be highly satisfactory.

<sup>&</sup>lt;sup>1</sup> "Laboratoire d'inspection à Nouakchott (LIN)" (Nouakchott Inspection Laboratory): LIN officially changed its name in the following year of which the project was completed. In 2007, with establishment of the National Office of Sanitary Inspection of Fishery Products and Aquaculture (National d'Inspection Sanitaire des Produits de la Pêche et de l'Aquaculture: ONISPA), LIN was regrouped as the "Nouakchott branch of ONISPA," which is currently called in French "Antenne ONISPA de Nouakchott." For the convenience in understanding, however, this report uses LIN, which is the term commonly used in the Basic Design Study Report (2004) of this project.

## **1. Project Description**



## 1.1 Background

Islamic Republic of Mauritania (hereinafter referred to as "Mauritania") has abundant commercial fishery products such as pelagic fish<sup>2</sup>, porgy, soles, and octopus. Traditionally, not much of Mauritania's fish production is consumed within the country. Majority of the catches are exported to Europe, Japan and its neighboring countries. Fisheries developed in Nouadhibou in the northern coast of Mauritania have expanded down to the south endowed with untapped rich marine resources. Accordingly, the country has promoted to develop fisheries around Nouakchott. In the coastal areas of Nouakchott, major exportable fishery products are brought into the market by small-scale fishers operating pirogues. Thus, an increased catches in Nouakchott area directly fosters local small-scale fisheries.

Fishery is considered to be one of Mauritania's key industries to promote its national development, as a means of not only earning foreign exchange, but also creating employment opportunities for local people. Ministry of Fisheries and Marine Economy of Mauritania (Ministère des Pêches et de l'Economie Maritime: MPEM) has placed its highest priority on hygiene management of fishery products exported to EU. To achieve this, MPEM formulated the hygiene standards of exportable fishery products of Mauritania (1996) and granted the National Center of Oceanographic Research and Fisheries (Centre National de Recherches Océanographiques et de Pêches: CNROP) with institute status to become the Mauritanian Institute of Oceanographic Research and Fisheries (Institut

<sup>&</sup>lt;sup>2</sup> Pelagic fish: In general, fishes living in the sea are categorized in pelagic fish or bottom fish. The former migrate in great numbers below the surface of the sea, including herring, sardine, anchovy, decapterus, skipjack, and tuna.

Mauritanien de Recherches Océanographiques et des Pêches: IMROP). A primary factor behind these actions was more rigorous hygiene regulations imposed on fishery products exported to EU, particularly in 1990s awaiting its economic integration.

While IMROP, located in Nouadhibou, had expanded facilities of the Inspection Laboratory of Nouadhibou, Nouakchott had no counterpart laboratory to carry out hygiene inspection of increasing exportable fishery products caught in that area. About 40% of the fishery products in Nouakchott had been exported to Europe via Nouakchott Fish Market (Marché aux Poissons de Nouakchott: MPN), which was constructed with the Japanese grant aid in 1996. Although, at that time, MPN was built as an ordinary market facility, it subsequently needed rehabilitation in order to comply with the hygiene standards in the country.

Given this background, the government of Mauritania had designed the Project for Improvement of Hygienic Examination Facilities for Fishery Products in Nouakchott to pursue better hygiene management of MPN, developing proper inspection of exportable fishery products handled in the area. The government had then requested Japan to support implementation of this project through provision of a grant aid.

# **1.2 Project Outline**

In Nouakchott where the fishery exports to Europe are increasing, this project was intended to renovate MPN facilities, provide essential handling equipment, and construct a new inspection laboratory in Nouakchott while also providing inspection equipment. This would enable proper handling and inspection of fishery products unloaded in MPN in conformance with the hygiene standards, which is required for the export to Europe.

Grant Limit / Actual Grant Amount		1,018 million yen / 1,015 million yen				
Exchange of N	otes Date	September 2004				
Implementing Organizations		Bureau of Small-Scale and Coastal Fisheries, Ministry of Fisheries and Marine Economy of Mauritania [La Direction de la Pêche Artisanale et Côtière: (DPAC), Ministère des Pêches et de l'Economie Maritime: (MPEM)]				
Project Compl	etion Date	March 2006				
Practitioners	Main Contractors	Constructor: Chizaki Kogyo Ltd. Procurement: Moriya Shokai Ltd.				
	Main Consultant	OAFIC Ltd. (Ex-Overseas Agro-Fisheries Consultants Co. Ltd.)				
Basic Design		July 2004				
Related Projec	ts (if any)	[Technical Cooperation]				

A long-term expert "Fisheries Administration
Advisor" (2001-2003, 2010-2013)
[Grant Aid]
"Nouakchott Fish Market Construction Project"
(1994)
"Follow-up Study on the Project for Improvement of
the Sanitary Conditions and the Hygiene of Fishery
Product (Construction)" (2011)
[Other Aid Agencies]
EU, UNIDO, World Bank, etc.

## 2. Outline of the Evaluation Study

## 2.1 External Evaluator

Machi KANEKO, Earth and Human Corporation

## 2.2 Duration of Evaluation Study

The External Evaluator performed an evaluation study as follows in the course of this ex-post evaluation:

Duration of the Study: September 2012 - February 2014

Duration of the Field Study: February 6-16, 2013 and June 20-July 6, 2013

# 3. Results of the Evaluation (Overall Rating: A<sup>3</sup>)

# 3.1 Relevance (Rating: <sup>(3)</sup>)

3.1.1 Relevance with the Development Plan of Mauritania

At the time of the project planning, Mauritania had been implementing a Public Investment Plan (1998-2001) as a part of its national development policy. Its objectives sought for (1) 5.5% of annual GDP growth rate, (2) 3% of inflation rate, and (3) reduction of a fiscal deficit. To achieve them, the country had highlighted key issues to be addressed in (1) promoting the private sector and the sustainable economic growth and (2) increasing investment in long-term human resource development. For Mauritania, moreover, export of fishery products expected to play a vital role in its national development through earning foreign exchange and creating employment opportunities. Thereby MPEM formulated the Fishery Sector Development Strategy (1998-2004), highlighting (1) promotion of value-added small-scale coastal fisheries and (2) development of hygiene inspection system required for fishery export to Europe.

The major actions associated with the Strategy included:

<sup>&</sup>lt;sup>3</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>&</sup>lt;sup>4</sup> ③: High, ②: Fair, ①: Low

- (1) Restoration of small-scale coastal fisheries zone (limiting areas of commercial trawling)
- (2) Integration of landing points to improve a distribution chain in the fisheries sector (seashores in Nouakchott area and those along the Imraguen village)
- (3) Conservation of bottom fish resources, and systematization of data collection
- (4) Formulation of the hygiene standards of exportable fishery products of Mauritania
- (5) Granting the National Center of Oceanographic Research and Fisheries (CNROP), which was the inspection laboratory for exportable fish products, with institute status to become the Mauritanian Institute of Oceanographic Research and Fisheries (IMROP)

The ex-post evaluation study identified Mauritania's fisheries remains a key industry that earns more than half of its total foreign exchange. It is also expected to play an important role in poverty reduction and social development of the country. The ongoing Poverty Reduction Strategy Paper (PRSP III, 2011-2015) underscores a policy priority of economic growth for the poor people who engage in fisheries and other sectors.

Furthermore, a fisheries sector strategy known as the "Strategic Framework for Sector Management in Fisheries and Aquaculture" (2008-2012) has sought for the sustainability of marine resources and economic integration of fisheries into the national account. The four primary objectives include:

- (1) Appropriate fisheries management and optimization of the fisheries income
- (2) Economic integration of fisheries into the national account so as to support the overall socio-economic development of the country
- (3) Management of marine resources, environment conservation and habitat protection for coastal fish
- (4) Proposition to enact laws and regulations which mandate efficient realization of three objectives above

The said Framework points out "MPN has urgent needs of facility development in order to expand export of fishery products to Europe." It continues, "MPN should serve as a primary landing point that meets international hygiene standards as well as an auction site observing the Islamic principles." In addition, the Framework seeks for sanitary operation of small-scale fishers' pirogues<sup>5</sup> (use of ice boxes) and compliance of the hygiene standards on various facilities to handle fishery products (an auction market, processing factories, landing sites, ports, bridges and seashores).

<sup>&</sup>lt;sup>5</sup>Pirogues are wooden canoes with outboard motors, mostly operated by small-scale fishers. In Mauritania, fishers use pirogues for regular fishing, and fishing with octopus pots and gill nets.

Given these circumstances, the project to support fishery export to Europe was relevant with Mauritania's policies at its planning stage. Also at the time of the ex-post evaluation, the project has relevance with the ongoing policies that encourage infrastructure development of MPN and hygiene control of marine resources.

## 3.1.2 Relevance with the Development Needs of Mauritania

With about 750 km of the Atlantic coastline, Mauritania is endowed with rich marine resources as a result of which the Canary Current from the north and the Guinea Current from the south meet. Also, the country has long engaged in fisheries, as neighboring Canary Island and Senegal have vigorously expanded their fishing operations. The Mauritanian, however, have limited consumption of fish products, and the most of the catches are brought into the export market. In Nouadhibou, foreign fishing fleet and joint venture vessels have been leading commercial fisheries on the northern coast of the country. In the southern coasts of Nouakchott, on the other hand, a number of small-scale fishers operate their pirogues to catch octopus, soles, blue drums and other kinds of fish that are exported to Europe.

In Europe, in response to trade liberalization associated with its economic integration, EU Directive 91/493/CE was issued in 1991 to enforce hygiene standards for fish and fishery products distributed in the regional market. They are standard operating procedures and proper processing standards prerequisite for implementing HACCP-based<sup>6</sup> (Hazard Analysis Critical Control Point) system in seafood processing. Given this new policy, importing countries of fish and fishery products in EU came to enforce hygiene requirements on processing factories and factory ships, inspection laboratories, and the management system.

In light of this policy development in Europe, in March 1994, the government of Mauritania issued a "Government Ordinance on Hygiene Standards and Inspection Requirements for Production and Distribution of Fishery Products." With this, the government had taken a step to develop the hygiene standards in accordance with EU Directive 91/493/CE so that fish and fishery products caught and processed in the country meet inspection requirements of importing countries. Accordingly, IMROP launched rehabilitation of Nouadhibou Inspection Laboratory in January 1996, to improve its poor analytical capabilities in approving processing factories, conducting hygiene inspection and issuing sanitary certificates of exportable fishery products.

Subsequently, as a result of its on-site survey in Mauritania in March 1996, EU placed a total ban on the import of fishery products due to its inadequate inspection procedures and

<sup>&</sup>lt;sup>6</sup> HACCP (Hazard Analysis Critical Control Point) refers to monitoring procedures to prevent any hazards of foods at each stage of receiving, processing and marketing.

processes. The decision further required Mauritania to accept EU's reassessment in July of the same year, regarding to what extent Mauritania improved by then its hygiene control of fishery products. This monitoring included a review of the situation of Nouadhibou Inspection Laboratory.

To complete its most pressing task, the government of Mauritania formulated the hygiene standards in June 1996. As a competent authority, IMROP was then empowered to implement inspection standards, accredit processing factories and issue sanitary certificates of exportable fishery products that are rigorously required by developed countries.

However, IMROP at that time had an inspection laboratory only in Nouadhibou where its headquarters were located. In Nouakchott, there was virtually no counterpart facility to inspect increasing exportable fishery products. In addition, MPN, provided with the Japanese grant aid in 1996, was built as an ordinary market facility. It subsequently needed a rehabilitation so as to meet the hygiene standards of the country.

As mentioned above, Mauritania had to accelerate the implementation of the hygiene regulations, particularly for fishery export to EU. The project was intended to support the country to address specific issues associated with such requirements, and therefore it was highly relevant with Mauritania's development needs at the planning stage.

At the time of the ex-post evaluation, Mauritania is still endowed with rich aquatic habitats, especially with those marine resources of commercially valuable bottom fish such as octopus (totaling 70 different kinds of export fish products). As indicated in Table 1, the total fish exports have largely increased, more than doubled during five years since 2006. For Mauritania, fishery products continue to be a primary source of foreign exchange earnings, followed by industrial products. The major importers of the country's fishery products are EU, and an increasing volume of fish exports from Mauritania to these countries meet the hygiene requirements pursuant to the HACCP-based system (See Table 2).

It is notable Japan imports the bulk of octopus caught in Mauritania, amounting to approximately 20,000 tons of the 32,000 tons fished in 2011.

volumes of Fishery Froducts							
	2006	2007	2008	2009	2010	2011	
Total export values (million UM)	367,200	364,600	431,700	357,400	571,800	n.a.	
Total export values of fishery products (million UM)	45,993	64,092	66,510	83,953	91,372	122,774	
Total export volumes of fishery products** (million UM)	106.8	143.1	171.4	156.4	193.2	286.7*	

Table 1: Total Export Values, Total Export Values of Fishery Products, and the Total Export Volumes of Fishery Products

#### Source: MPEM

\*The export volume in 2011 indicates aggregation of 7-month period, instead of the annual volume. \*\*The export volumes are indicated in product weight instead of net fish weight.

When the project completed the construction of Nouakchott Inspection Laboratory (Laboratoire d'Inspection de Nouakchott: LIN) in March 2006, the facility started its operation as one of IMROP's subordinate organizations. In 2007, the government of Mauritania established the National Office of Sanitary Inspection of Fishery products and Aquaculture (National d'Inspection Sanitaire des Produits de la Pêche et de l'Aquaculture: ONISPA) as an autonomous agency under MPEM to expand the fish exports for EU. LIN and Nouadhibou Inspection Laboratory were then separated from IMROP, and LIN was regrouped as a Nouakchott branch of ONISPA (consisting of Nouakchott Laboratory (Laboratoire de Nouakchott) and Southern Inspection Service (Service d'Inspection Sud)). Currently, ONISPA consolidates development and enforcement of hygiene regulations for fishery products, with a particular focus on quality assurance management. It serves as a competent authority to accredit processing factories of exportable fishery products and issue sanitary certificates in compliance with the hygiene standards.

EU undertakes an on-site inspection every three years to examine whether the hygiene standards are properly enforced in Mauritania. It requires immediate improvement of any unsatisfactory practices identified. To cope with this, the country has revised laws and regulations in accordance with changes in international trade policies, particularly in EU's regulatory frameworks. Furthermore, processing factories must accept an inspection survey conducted in compliance with a "Manual for Inspection and Procedures of the Quality Control of Fishery products in Mauritania." This manual is also revised regularly to reflect major policy changes.

Again, the project was intended to strengthen the hygiene control of exportable fishery products by constructing LIN and renovating MPN. It has been relevant with Mauritania's development needs both at the time of its planning and the ex-post evaluation study.

#### 3.1.3 Relevance with Japan's ODA Policy

At the planning stage of this project, the government of Japan did not have a country-specific assistance strategy for Mauritania. However, its ODA White Paper of 2004 states that the bilateral assistance for Mauritania should be directed at democratization and political stability, poverty reduction for socially and economically vulnerable people, and reform of the weak economic structure against external conditions. It points out these efforts would contribute to alleviate poverty and promote sustainable economic growth, which are the primary focus of Japan's development assistance addressed in its ODA

Charter. Given the fact that Mauritania is under the Enhanced Heavily Indebted Poor Countries Initiative (HIPC), the ODA policy for the country has a relatively limited scope of the bilateral aid in which yen loans are suspended for the time being. Nonetheless, the government of Japan, as the Paper indicates, would help poverty reduction and economic reform of Mauritania through provision of grant aid and technical cooperation in meeting basic human needs of the people and developing the fisheries sector.

As described above, through its grant aid, Japan has provided continuous support for Mauritania's fishery sector development. The project was a part of such effort, and therefore has been consistent with the development policy of Japan toward Mauritania.

In light of the above, this project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

# **3.2** Effectiveness<sup>7</sup> (Rating: ③)

- 3.2.1 Quantitative Effects (Operation and Effect Indicators)
- (1) The volume of exportable fishery products shipped from MPN in compliance with the hygiene standards

As indicated in Table 2, the volume of the fish exports for Europe reached 3,762 tons in 2007, exceeding a target amount of 3,000 tons per year. Subsequently, it was gradually increasing, amounting to about 7,000 tons in 2012.

As indicated in Table 3, whereas the volume of fishery products handled in MPN was 7,740 tons in 2007, it more than doubled to 17,416 tons in 2012. This demonstrates the renovated fish market facilities are fully utilized.

Table 2: Volumes of Exportable Fishery products Shipped from MPN to Europe

Target Value	Actual values						
2007	2007	2008	2009	2010	2011	2012	
3,000 tons per year	3,762	4,082	5,483	5,108	5,354	6,926	

Source: MPEM

Table 3: Changes in	Volumes of Fish	nery Products	Handled in	MPN
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				(unit	ton)
2007	2008	2009	2010	2011	2012

<sup>&</sup>lt;sup>7</sup> Effectiveness should be judged in consideration of impact to determine a rating.

Pelagic fish	n.a.	n.a.	2,252	3,563	3,359	5,459
Bottom fish caught by "day-boats" fishing <sup>8</sup>	n.a.	n.a.	9,176	9,200	8,553	11,956
Total	7,740	9,155	11,428	12,763	11,912	17,416

Source: MPEM

Note: Cephalopod such as octopus and squid are included in bottom fish.

(2) The number of hygiene inspections conducted on fishery products exported from Nouakchott

Table 4 shows a record of LIN's inspection performance. The number of its inspections was 1,568 in 2007, and it increased to 3,625 in 2008. It indicates 90% of the target value (4,000) has been achieved. In 2009, the number of LIN's inspections exceeded the target value, and continued to increase until 2012 in proportion to growing volumes of fishery products.

Table 4: Number of the Hygiene Inspections Conducted by LL	Table 4: Number	of the Hygiene	Inspections	Conducted by LI
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							(unit: ins	pection)			
Type of	of analysis	Target Value		Actual values							
51		2007	2007	2008	2009	2010	2011	2012			
Sensory	Laboratory		n.a.	n.a.	14	34	11	25			
evaluation	Factory		n.a.	1,653	1,735	1,200	2,200	2,620			
Bacteria			n.a.	503	494	702	434	465			
Physical and chemical analysis			n.a.	515	828	512	460	326			
Water quality (chemical)			n.a.	528	1,218	676	1,296	1,171			
Water co (ba	ntamination cteria)		n.a.	426	307	864	1,341	1,000			
1	Total	4,000	1,568	3,625	4,596	3,988	5,742	5,607			

<sup>&</sup>lt;sup>8</sup> Bottom fish: Fishes living on, in or near the bottom of the sea, such as porgy, flatfish, soles, flathead, and redwing searobin.

Source: ONISPA Note: For sensory evaluation, an inspector visits processing factories to examine their fish samples. It is a rare case samples are brought into the laboratory for inspection.

As described in the section of the project's relevance, LIN was once a subordinating body of a research institute known as IMROP. It was then regrouped as "ONISPA's Branch in Nouakchott." ONISPA was established by the government of Mauritania in 2007 for the purpose of strengthening the hygiene management of fishery products. While requiring some time to develop its organizational functions, ONISPA obtained a budget from the government in 2008. This enabled ONISPA and its affiliated agencies to launch their general operation. For this reason, the number of inspections conducted in 2007 and 2008 was below the target values. Since 2009, however, LIN has engaged in normal operation.

As a part of ONISPA's accreditation process, LIN undertakes a compliance assessment of processing factories operating in Nouakchott. Based on the test results, ONISPA approves food safety of processing factories and issues heath certificates of their fishery products in accordance with the detailed guideline of



the HACCP-based system provided by EU. It also reviews HACCP manuals developed by each factory (see the picture shown in the next page) and approves conformance with the guideline. Mauritania has 44 HACCP-approved factories<sup>9</sup> exporting fishery products to EU, and of these, 9 factories are operating in Nouakchott.

Table 5 below shows the total number of ONISPA-accredited processing factories in Mauritania. At present, 21 factories are operating in Nouakchott. ONISPA conducts an annual inspection for all of these factories to ensure quality of their seafood processing. Any violations of the regulations and guidelines result in improvement orders given to the processors concerned. If not complied, ONISPA issues a warning, and subsequently

<sup>&</sup>lt;sup>9</sup> (Reference) In general, it requires significant efforts to obtain HACCP accreditation of exportable fishery products for EU. Whereas Mauritania has 44 HACCP-accredited processing factories (ranked in 26<sup>th</sup> place worldwide), Japan has 25 factories (33<sup>rd</sup> place) as of 2011. The country with the largest number of HACCP-accredited factories (947) is U.S. As for Mauritania's neighboring countries, Morocco has 358 factories (5<sup>th</sup> place) and Senegal, 61 (22<sup>nd</sup> place).

suspends operation of the violating factories. In the worst case, it may revoke the factories' accreditation.

Table 6 indicates a record of ONISPA's inspections including unannounced random check on processing factories in Nouakchott.

In addition to the aforementioned on-site inspection, ONISPA is responsible for issuing sanitary certificates of fishery products required by each export lot and exporter. These are indispensable to clear the customs of European countries and other destinations. The number of certificates issued in each year is shown in Table 7. In 2012, ONISPA issued about 5,000 certificates.

Table 5: Number of Processing Factories Meeting the Hygiene Standards of Mauritania

(mit.	factory
(unit.	Tactory)

Area	2007	2008	2009	2010	2011	2012
Nouadhibou	34	35	39	41	44	48
Nouakchott	19	13	15	19	18	21
Total	53	48	54	60	62	69

Source: ONISPA

# Table 6: Number of On-site Inspections on ONISPA-Accredited Processing Factories

					(Uni	t: inspection)
Area	2007	2008	2009	2010	2011	2012
Nouakchott	31	26	50	86	57	67

Source: ONISPA

Note: In 2010, ONISPA conducted inspections more frequently in order to enforce hygiene management of the processing factories.

Table 7. Number	of Sanitary	Certificates	of Fisherv	products	Issued by ONISPA
	of Summary	Continicates	of i isnery	produces	155ucu by 01115171

(unit: certificate)

Area	2007	2008	2009	2010	2011	2012
Nouakchott	3,353	4,203	4,795	3,793	5,426	5,499

Source: ONISPA

Note: The sanitary certificates are issued on an export-lot basis, and therefore do not necessarily correspond to the export volume.

#### 3.2.2 Qualitative Effects

At the time of the project planning, several indicators were provided to assess some qualitative effects of the project, looking into NMF's operation pursuant to the hygiene standards and LIN's inspection management. Also, through seminars and training programs, the project was intended to enhance understanding of people related to quality control of fishery products.

As for MPN, compared with its overall operation prior to the project, it has developed managerial capabilities in response to the increase of exportable fishery products. LIN has also enforced its quality control of fishery products shipped from each processing factory so as to meet the hygiene requirements. Specifically, the laboratory imposes on-site assessment and sanitary certificates upon the factories to allow their seafood export.

In addition, inspectors of LIN, and managers and processors of the accredited factories have participated in seminars funded by EU, the United Nations Industrial Development Organization (UNIDO) and other aid agencies. They have learned more about HACCP-based system than prior to the project implementation.

## 3.3 Impact

3.3.1 Intended Impacts

(1) Indirect Impacts

The project expected to have indirect impacts to be verified with the following two indicators.

- Indicator 1 An improvement of the trade balance associated with an increase in fishery exports of Nouakchott, and an increase in employment in the export fisheries sector
- Indicator 2 An improvement of living standards of small-scale pirogue fishers, processing factory workers, dealers and retailers.

As discussed in the section of the project's relevance, the overall fish exports of Mauritania have been increasing, thereby indicating the growing trade profit. Although fishery products exported from Nouakchott remains approximately 10 to 15% of the total fishery export volume of the country, it is increasing annually. Nouakchott now exports larger volume of fresh fish than Nouadhibou, which are particularly favored by European countries, (see Table 9). Given such upward export trend, the project has a positive impact on Mauritania's trade balance and employment in the fishery sector.

As for the indicator 2, MPEM's source indicates the number of pirogues operated by small-scale fishers in the coastal area of Nouakchott was 3,059 in 2012. It is a fivefold increase compared with 633 in 1998, according to the data revealed prior to the project planning. Table 8 shows the number of commercial fishing vessels and pirogues operating in Mauritania's sea areas. The small-scale fishers' pirogues are increasing annually, with half of them fishing in Nouakchott area. The project has helped provide landing points for small-scale pirogue fishers.

 Table 8: Changes in the Number of Commercial Fishing Vessels and Pirogues

(unit:	vessel)
(umt.	vesser

Type of fishir	ng vessels	2006	2007	2008	2009	2010	2011	2012
Commercial	Domestic boats	143	116	122	112	101	91	75
vessels	Foreign boats	197	137	149	134	142	155	n.a.
Pirogu	es	3,116	3,116	4,022	4,479	6,079	6,468	6,950

Source: MPEM

\*Pirogues require operation license, and their catches should be landed in the designated points.

Table 9 below indicates the changes in the volumes of different kinds of fishes exported from Nouadhibou and Nouakchott to Europe and others. Nouadhibou exports mainly cephalopoda (octopus and squid) and pelagic fish suitable for froze fish products. In Nouakchott, on the other hand, export volumes of fresh fish products are larger than Nouadhibou, which are mostly bottom fish such as orgy and soles caught



by pirogues. Compared with Nouadhibou where large commercial vessels are predominant,

Nouakchott provides fishing spots to small-scale fishers. With a rehabilitation of MPN, the project appears to have contributed to improve livelihoods of such pirogue fishers.

							(unit. ton)
Site	Product type	2007	2008	2009	2010	2011	2012
	Frozen fish	16,992	8,006	24,108	13,480	13,337	13,567
Nouadhibou	Fresh fish	2,370	779	2,921	2,025	2,526	2,426
	Total	19,362	8,784	27,029	15,505	15,863	15,993
	Frozen fish	n.a.	1,858	3,796	2,282	2,137	3,824
Nouakchott	Fresh fish	n.a.	2,225	1,688	2,826	3,217	3,102
	Total	3,762	4,082	5,483	5,108	5,354	6,926

Table 9: Export Volumes by Fishery Product Type(for Europe Countries of Destination)

Source: MPEM

To assess the project impacts, the ex-post evaluation study conducted a beneficiary survey and interviews with different groups of stakeholders. They included processing factories of exportable fish landed in Nouakchott (one of 12 factories interviewed was a foreign-affiliated plant), dealers in MPN who grade fish caught by small-scale fishers, and women retailers and small-scale fishers. Generally speaking, the last two groups of people are poor in the overall fishery sector of Mauritania. Table 10 shows major findings. The degree of the project effects varies among the sample groups, depending on what part of MPN facilities they use. It is notable 85% of the processing factories were working for their business expansion, anticipating an increase of fishery exports from Nouakchott.

Also, 78% of the fish dealers said their incomes had increased. However, partly because an ice machine in MPN has been out of operation, some of them pointed out MPN should improve its services. Although 85% of the women retailers said they gained more income than before, 90% of them recognized a decrease in buyers of their fish products. The primary reason appears to be that the government provides fish to the low-income households free of charge. In addition, MPN has more strict access control to strengthen a security. This suggests MPN needs to ensure that women subsisting on the fish market can be equally benefited from the development of



Women retailers of fish and fishery products

the fishery sector. As for the project effect on small-scale fishers, their catches are now traded at higher unit prices than before, mostly because they are better handled in terms of the hygiene. The rehabilitation of MPN has thus contributed to an improvement of these fishers' livelihoods.

# Table 10: Outcomes of the Beneficiary Survey and Interviews with Processing Factories,<br/>Dealers, Small-scale Fishers and Women Retailers

	Summary
Processing Factories of Exportable Fishery Products	Among twenty-one processing factories operating in Nouakchott, the survey obtained responses from thirteen plants. They have been operating before the project was started. Major buyers of their fishery products are Italy, France, Spain and Japan. Processing a variety of fish, most of them export whole or sliced fish fresh or frozen. Semi-prepared fish products are provided by one of these factories. Managers in charge of hygiene control at the respective factories are required to lay out their own HACCP plans. Nine factories among the thirteen have LIN-approved guidelines, and the rest are working on the revision under the laboratory's supervision. In the past, all of the factories required some kinds of operational improvement in response to LIN's on-site inspections. (Violation of the requirements will result in a revoke of accreditation.) Profit from the fish exports fluctuates depending on economic trends in the importing countries, particularly in Europe. Seven factories indicated their sales have increased compared with the level attained before the project implementation. Eleven factories were planning to expand their business, which represents their intention to increase investment in the fish export. It was noted, however, the factories were unable to treat an increasing volume of waste water discharged from their seafood processing, and that some kinds of measures should be provided for the entire factory sites.
Dealers	Dealers of fish and fishery products are essential users of MPN. Not only they are contributors to the market operation by paying their booth rental fees and shipping charges (required in shipment from the market to processing factories), but also they have an important role in grading fishes caught by small-scale fishers. Among 18 dealers who rent booths in the market, 14 dealers said their incomes had increased compared with before the project implementation. On the other hand, 14 dealers equally indicated they have to trade with more competitive prices than before. Each dealer buys fish from specific pirogue fishers, representing their fixed trading relationships with certain fishers. These dealers wholesale fish to processing factories, retailers and restaurants. Dealers pointed out some of the problems in MPN, saying, for instance, an ice machine was not working. According to the Cooperative Corporation of MPN (Société Marché aux Poissons de Nouakchott: SMPN) responsible for the facility operation, it is working for improvement of the services. It appears to be necessary for the Corporation and the dealers to have more communication to obtain mutual understanding on this matter.
Small-scale fishers	Half of the twenty sample small-scale fishers unloading their catch at Nouakchott landing points said their incomes had increased compared with before the project implementation. The rest indicated no change. On the other hand, 19 fishers stated fish prices indicated by dealers were higher than five years ago. They have become more aware that proper handling of fish increases the value of the products marketed (equally 19 fishers practice some kinds of preservation such as use of ice on the pirogues and prevention of sand from attaching on fish during landing). Fifteen fishers indicated their families had better livelihoods than before. They have several buyers of their catch such as dealers (15), processing factories (13), retailers and restaurants (7), and direct sales (20) (the numbers in parentheses indicate responses of fishers with multiple answers).

Summary

Among 20 women retailers and merchants in MPN, 17 women said their cash incomes had increased compared with before the project implementation. Sales prices have also increased, 15 women said, and 11 women indicated their families have better livelihoods than before. On the other hand, 18 women experienced a decreased number of buyers in the market, making them concerned about their future business. The primary reason of such a decrease is more strict access control imposed on those who enter the market. It has been applied to regulate black-market trading and increase security in and around MPN (including prevention of stealing).

Source: The beneficiary survey and interviews conducted in the ex-post evaluation study

#### 3.3.2 Other Impacts

Women retailers

## (1) Impacts on the Natural Environment

When the project was planned, the seashore of Nouakchott including the MPN site had been designated area for the environmental conservation since 2005. Accordingly, with supports from international aid agencies, Mauritania has promoted coastline afforestation through implementation of "the Project for Dune Rehabilitation" and "the Greenbelt Project."

At present, treatment of waste water discharged from MPN and those emissions from LIN into air meets the environmental requirements of Mauritania. Any negative impact on the natural environment has not been reported so far. Nonetheless, many processing factories are concerned with waste water increasing year after year. Expected increase in fish exports will possibly worsen the problem in the stretch of the Nouakchott seashore. Environmental protection measures including waste water treatment system need to be provided in the future.

### (2) Land Acquisition and Resettlement

Land acquisition for LIN was processed smoothly, as the government of Mauritania provided part of its national land. Resettlement of local people was not undertaken.

In light of the above, this project has largely achieved its objectives, therefore its effectiveness and impact is high.

# **3.4 Efficiency (Rating: ③)**

### 3.4.1 Project Outputs

Table 11 is a list of the project outputs planned and provided by Japan. They were required for (1) rehabilitation of MPN facilities to handle exportable fishery products (the fish market and temporary carry-in sites for pelagic fish), (2) construction of LIN, and (3) provision of equipment for inspection and handling of fishery products. Majority of the outputs were supplied as planned, except for minor changes in specifications and quantities

of some equipment.

The outputs provided by Mauritania are shown in Table 12. While garbage trucks and incoming telephone lines were cancelled, the overall outputs were provided with planned values.

Table 11. List of Outputs Provided by Japa	an
Tuble 11. List of Outputs 110 flued by supe	ŧ11

*The number	in	parentheses	indicates	the	quantity.
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Item	Plan	Actual
(1) Nouakchott (rehabilitat	t Fish Market (Marché aux Poissons de Nouakcho ion of the existing facilities)	tt: MPN)
Fish market building (rehabilitation of the existing facilities)	Fish market hall Booths for dealers (20) Administration office, office room in the fish market section Toilet facilities, a shower room, and storage facilities Partially two-storied reinforced concrete structure Partial installation of interior roofing with refractory cement (steel truss) Partial installation of exterior walls (wooden framework) paneling with refractory cement	No change
Temporary carry-in sites for pelagic fish	Temporary carry-in points, drainage ditches, sand prevention partitions, A single-story, reinforced concrete structure	No change
Facilities	Ice machines with a production capacity of 5 tons/day (2) Ice tanks with a storage capacity of 10 tons (built-in ice tanks of the ice machines) (2) Refrigerators with a flat storage capacity of 10 fish boxes of 80 kg (2) Receiving tank, elevated water tank Purification tank with aeration system (a purifying capacity of 15 $m^3/day$ )	Refrigerants of the ice machines and refrigerators were changed from R22 to R134a. (Reason) The R22 refrigerants (alternative CFC) were generally replaced with the new R134a system released in the market.
(2) Nouakchott (New const	t Inspection Laboratory (Laboratoire d'Inspection truction with site area of $4,420 \text{ m}^2$ )	de Nouakchott: LIN)
Laboratory	Laboratory rooms, inspector offices, seminar rooms, reference room, information processing room, office of certification, administration office, toilets, etc. Partially two-storied reinforced concrete structure	Shower rooms were provided in men's and women's toilets respectively. (Reason) For a sanitation purpose
Electric room	Incoming transfer room, panel room, emergency power generation room A single-story, reinforced-concrete structure	No change
Facilities	Electric facilities: Emergency generator (1) (1000KVA), Incoming and cabinet panel, voltage stabilizer	No change

Item	Plan	Actual
	(1) (100KVA), air conditioner, etc.	
	Water supplying system and drainage	
	facilities: Receiving tank, elevated water tank,	
	purification tank, waste-water treatment	
	facilities, etc.	
	Other facilities: laboratory tables, gas pipes,	
	particular gas pipes, ventilation facilities	
	Emission treatment facilities, anti-disaster	
	lacinties, LAN cable, etc.	
Exterior	Access road and pavement: concrete pavement	No change
facilities		
(3) Equipment	for analysis and handling of fishery products	
Handling	High-pressure washing machines (2)	No change
equipment	Fish boxes for storage (20)	
	Carry-in fish boxes (100)	
Materials for	LCD projector (1), video camera (1), copving	No change
instruction	machine (1), desk-top PC (6), color printer (1),	
and	LAN cable (1 set), etc.	
information		
gathering		
Equipment for	Freezers (2), refrigerators (2)	Two stereoscopic microscopes were
sensory	Defrost machine (1)	replaced with an inverted microscope.
evaluation	Parasite inspection equipment (4)	(Reason)
	Desktop projector (1)	An inverted microscope was
	Stereoscopic microscopes (2)	considered to be more useful in LIN's
	Digital balances (measuring range:	inspection process. The quantity was
	medium-heavy) (4)	reduced as it turned out to be less
Equipment for	Autoclause (2)	Irequently used.
Equipment for	Autociaves (2) Media dispensers (2)	No change
1 examination	Water purifying apparatus (1)	
1 examination	Clean benches (2)	
	Incubators (6)	
	Biological microscopes (2)	
	Dry sterilizer (1), etc.	
Equipment for	BOD analyzer (1)	For glassware, volumes of beakers and
physical and	TOC analyzer (1)	measuring cylinders were changed as
chemical	Ultrapure water system (1)	follows:
analysis	Gas chromatograph (1)	1. Beaker: 500 ml x (6) $\rightarrow$ 1,000 ml x
	High performance liquid chromatography (1)	(3)
	Atomic absorption spectrophotometer (1)	2. Measuring cylinders:
	Fluorescence spectrophotometer (1)	$25 \text{ ml x } (5) \rightarrow (2)$
	Kjeldahl distillation apparatus (1)	$50 \text{ ml } x (5) \rightarrow (2)$
	Cleansing equipment, glassware, etc.	$100 \text{ ml x}(5) \rightarrow (2)$
		$\begin{array}{c} 230 \text{ mi x} (3) \overrightarrow{} (2) \\ \text{In addition two 500 ml ardindars and} \end{array}$
		m addition, two 500-mi cylinders and two 1 000-ml cylinders were provided
		(Reason)
		Nouadhibou Inspection Laboratory had
		used these volumes of glassware more
		frequently.

Source: The Basic Design Study Report, and the Defect Inspection Report

Item	Plan	Actual Output
(1) MPN (rehabilitation of the existing facilities	s)	fieldur output
1. Installation of outer fence and gates around the market, and a guardian's room	35,800,000 UM	27,000,000 UM (implemented as planned)
2. General office equipment and furniture	20,000,000 UM	10,000,000 UM (implemented as planned)
3. Garbage trucks	25,000,000 UM	Procurement of garbage trucks was cancelled since MPN decided to contract out waste disposal to a private service provider in Nouakchott.
(2) LIN (New construction)		
1. Installation of primary service wires and water supply pipes	6,900,000 UM	14,000,000 UM (implemented as planned)
2. Installation of telephone lines	4,500,000 UM	The installation was cancelled as mobile phones and wireless Internet access were to be provided.
3. Installation of outer fence and gates around the laboratory	15,000,000 UM	16,190,000 UM (completed in November 2006 due to a problem in the budget execution. LIN has proved no problem in its operation associated with this delay.)
4. Banking materials for soil preparation	17,000,000 UM	17,000,000 UM (implemented as planed)
5. General office equipment, telephones, furniture and expendable items such as reagent	85,800,000 UM	85,000,000 UM (implemented as planned)
Total	210,000,000 UM (About 86 million yen)	169,190,000 UM (About 73 million yen)

1 $1$ $1$ $2$ $1$ $1$ $3$ $1$ $1$ $3$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$	Table	12:	List	of Out	puts Pro	vided	bv	Mauritar	nia
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Note: The exchange rate applied to the actual outputs is as of March 2006 (1 UM =0.43 yen).

# 3.4.2 Project Inputs

## 3.4.2.1 Project Cost

As for the cost provided by the Japanese government for the project, the E/N limit was 1,018 million yen while the actual cost amounted to 1,015 million yen. Therefore, the cost expended by the Japanese side was lower than planned (99%).

As indicated in Table 12, whereas the cost estimated by the government of Mauritania was 210,000,000 UM (about 86 million yen), the actual cost was 169,190,000 UM (73 million yen).<sup>10</sup> Therefore, the project cost provided by the counterpart government was lower than planned (85%).

<sup>&</sup>lt;sup>10</sup> 1 UM = 0.43 yen as of March 2006

## 3.4.2.2 Project Period

The planned project period was 17 months, and the project was implemented within a given period of time from October 2004 to April 2006.

Both project cost and project period were within the plan. Therefore the efficiency of the project is high.

## 3.5 Sustainability (Rating: 2)

3.5.1 Structural Aspects of Operation and Maintenance

### 1) MPN

Constructed with the Japanese grant aid in 1996, MPN has been operated under the Cooperative Corporation of MPN (Société Marché aux Poissons de Nouakchott: SMPN). MPEM, which is the supervising authorities, is trying to replace the personnel of SMPN in response to changing needs of the fish market. It reduced the number of directors from 9 to 8 to save on the personnel cost, and assigned a new fish market manager in 2008 who has management know-how.

As shown in Table 13, compared with the initial 20 workers, MPN currently has 86 counterparts, increasing employees at general service division. This increase is associated with an expansion of MPN facilities funded by the government of Mauritania and the World Bank (such as a warehouse building, temporary carry-in sites, office of fisheries, streets, toilets and concrete paving).

		(unit: person)
Pos	ition/Division	Number of staff
Director		1
Fish market manager		1
Secretary		1
Fish market deputy manag	ger	1
Inspection division	Inspection section	4
Administration division	Personnel section	0
	General affairs section	14
	Accounting section	0
General service division	Sales section	16
	Cleaning section	47
Ice production division	Freezing machinery section	1
	Total	86

Table 13: Organizational Components of MPN

Source: SMPN

The on-site survey of the ex-post evaluation revealed the ice machine provided by the project has been out of operation. The study contacted with SMPN, MPEM and the

Japanese design consulting firm to find out what had caused such suspension. Their responses are provided as below respectively. The study also asked fish dealers in MPN about the current supply of ice, which requires a large amount of ice in preserving landed fishery products.

It should be noted, however, the survey was unable to fully understand the major reason for the aforementioned suspension. Considering a durability of the ice machine is about 8 years, the facility might have required a renewal at the time of the ex-post evaluation. Moreover, the key persons were retired, such as the former director and maintenance technician of MPN working at the time of the ice machine's suspension, and it is difficult to verify the reason.

Actors concerned	Explanation
SMPN	• In the post-project period, approximately since 2006, the private ice makers started
	to supply their ice at lower prices on the shore.
	• The ice machine in MPN entailed higher maintenance cost as it was frequently
	broken down. MPN suspended its operation in 2008.
	• In 2009, the government provided an ice compartment next to the fish market
	building, and operated only when the demand for ice was high so as not to affect the
	private ice makers.
	• Given the high demand for ice, it is desirable to replace the existing ice machine.
MPEM	• It is difficult to maintain machineries in such harsh environmental conditions as
	Nouakchott seacoast.
	•While MPN attempted to repair the ice machine, the frequent breakdown might have
	been caused by the technician's insufficient repair techniques.
	• While MPEM continues to contract out ice production to the private suppliers, MPN
	should remain a stable provider of ice because the demand varies seasonally.
Japanese	• The ice machines had been in operation without any problem until the defection
design	inspection was carried out.
consulting	• If properly maintained, the ice machine could have been operating more than ten
firm	years even in such harsh natural environment as Nouakchott.
Dealers	• The volumes of catch (in particular pelagic fish) are increasing.
	• Preservation of fish now requires a large amount of ice in order to keep ice boxes
	cool. Depending of the season, ice production of the private suppliers is not sufficient
	to cover the landed catch.
	• To increase convenience of the service, ice should be produced within MPN.

Among various possible factors resulted in the ice machine's suspension, some are related to inadequate maintenance system including insufficient technical skills of the technician at that time. However, due to the growing imbalance between supply and demand of ice, MPN has an intention to renew the ice machine. To do so, with this experience as a lesson, it is critical to develop maintenance system and human resources that are more responsible to meet the facility needs.

## 2) Nouakchott Inspection Laboratory (Laboratoire d'Inspection de Nouakchott: LIN)

Constructed in March 2006, LIN had been operated as one of the IMROP agencies. As

discussed before, the government of Mauritania established ONISPA under MPEM in 2007. Subsequently, the Government Ordinance of 2008 LIN Nouadhibou separated and Inspection Laboratory from IMROP to regroup them under ONISPA. At present, ONISPA has 100 staff members, including 19 executive officers and 22 senior engineers. LIN employs a total of 40 workers as shown in Table 14. The number of inspectors in respective divisions increased from 7 at the project completion to 17 in a process of ONISPA's operational formation as shown in Table 15.

By allocating highly qualified personnel, MPEM has worked for developing analysis abilities of LIN to strengthen quality control of fishery products in Nouakchott. As a result, in January 2013, LIN obtained ISO/IEC 17025(2005) for first time in the West African countries. More about this achievement will be reported in the following Table 14: Number of Current Employees at LIN

(ui	nt. person)
Administration division	18
Physical and chemical	7
analysis laboratory	
Bacteriological examination	6
laboratory	
Sensory evaluation room	9
Total	40

(unit nerson)

Source: ONISPA

Table	15:	Inspector	s Assi	igned	at LIN
				(unit <sup>.</sup>	person)

(unit: person)			
		At the time	
		of the	Current
		project	Current
		completion	
Physic	cal and chemic	al analysis	
divisi	on/Sensory eva	aluation divis	ion
	Ph.D	2	4
Diploma		3	6
Bacteriological anal		ysis division	
	Ph.D	0	0
	Diploma	1	3
High-school		1	4
graduate engineer			
Total		7	17
ONICDA			

Source: ONISPA

section. With support of EU, LIN is seeking further enhancement of its technical capacities. It demonstrates LIN has necessary operational set-up to continue a variety of inspection in the future.

## 3.5.2 Technical Aspects of Operation and Maintenance

#### 1) MPN

Operation and maintenance of the fish market hall is mostly satisfactory. Fishers and dealers use this hall for sorting and grading fish, and accordingly SMPN provides a dairy cleaning. For a purification tank with aeration system provided by the project, a technician gives a dairy checkup and water quality control.

On the other hand, the aforementioned ice machine is out of operation. Given the harsh environment in Nouakchott, a technician requires a dairy checkup and immediate repairs as necessary. The current method of maintenance needs a review to respond to the situation. The technician's skills and know-how should be developed at the same time.

## 2) LIN

In the defection inspection conducted one year after the project completion, some concerns were reported. One was the technical level of the inspectors assigned in LIN, and

another was training of newly employed inspectors. However, their know-how and operation of equipment have mostly attained the practical level. As described below, this was realized as a part of LIN's effort to obtain ISO/IEC 17025(2005). The Follow-up Study of this project (from September to November 2011) partly made up for LIN's lack of practical experience. The Study also revealed LIN had some operational weakness in calibration in chromatographic analysis and provision of a set of conditions. A technical demonstration of some equipment was given by the study team to LIN analysts.

As initially planned, SOMEDIB provides maintenance service for inspection equipment so as to ensure accuracy of the analysis. SOMEDIB-managed facilities are mostly in good conditions.

Behind the effort of MPEM and ONISPA to obtain ISO/IEC 17025(2005) accreditation was their strategic

intent on making Mauritanian fishery products more competitive in the international market by which a third-party accreditation agency confirms impartiality and reliability of LIN-issued heath certificates. For this end, it was essential for LIN to develop higher analytical competence that meets the international quality standards.

With support of UNIDO from 2010 to 2012, ONISPA implemented concrete actions to obtain ISO/IEC 17025(2005), focusing on quality improvement of analysis and testing for LIN. In November 2012, a Tunisian accreditation body member (TUNAC) made conformity assessment of LIN. In January 2013, its bacteriological examination laboratory as well as physical and chemical analysis counterpart obtained ISO/IEC 17025(2005) accreditation. It is valid for four years, and requires two regular assessments within that period (once within a two-year period).

Testing and calibrations<sup>11</sup> undertaken by ISO17025-accredited laboratories are assured





Atomic absorption spectrophotometer provided in LIN

ISO/IEC17025 (2005) Certificate  $\Rightarrow$ 

<sup>&</sup>lt;sup>11</sup> Calibration refers to "a set of operations that establish the relationship between values indicated by a measuring instrument or measuring system, or values represented by material measure and the corresponding values of the measure."

of the analytical quality among WTO member countries in accordance with the Agreement on Technical Barriers to Trade (WTO/TBT). In addition, those accredited laboratories are provided certificates that indicate the technical competence of their testing and calibration. They may use ISO17025 logo not only their testing and calibration reports, but also on an advertisement, and so forth. The logo thus serves to represent the laboratories' consistent quality control activities. ONISPA expects that obtained ISO/IEC 17025 will enhance recognition that Mauritanian fishery products are safe and reliable.

The process of which ONISPA pursued ISO/IEC 17025(2005) demonstrates LIN inspectors properly used various equipment provided by the project. Moreover, to prove LIN's higher analytical competencies, renewed efforts of ONISPA are being made to obtain the 2012 edition of ISO/IEC17020. With support of EU, ONISPA will organize internal and external training programs for two years from 2013.

## 3.5.3 Financial Aspects of Operation and Maintenance

Table 16 shows a balance of payment of MPN. Data is available only for the past three years, and MPN had been in deficit operation until 2011, receiving the government subsidies. Since 2012, it remains in surplus, operating on its own. SMPN seeks to keep the financial independence, so as not to depend on the government subsidies. To develop MPN facilities, the World Bank and China have been actively providing their financial support.

	2010	2011	2012
A Revenue	82,006,003	102,340,286	119,271,718
B Expenditure*	145,960,422	120,980,180	95,034,776
A-B	-63,954,419	-18,639,894	24,236,942
Government subsidies	90,000,000	30,000,000	0

Table 16: Revenue and Expenditure of MPN

(unit: UM)

Source: SMPN

\*Decline of the expenditure was caused by reduction of executive salaries (decreased from 9 directors to one) and by decreased water rates associated with development of water supply facilities in Nouakchott.

Table 17 shows details of the revenue of MPN. It is leasing all the booths to dealers, recovering leasing fees without default (a large booth charges 70,000 UM (21,700 yen) /month and a small one, 45,000 UM (13,950 yen)/month.<sup>12</sup>

 $<sup>^{12}</sup>$  1 UM = 0.31 yen (the exchange rate is as of January 2013.)

Table 17: Detailed Revenues of MPF

2010

27,605,550

	(unit: oni)
2011	2012
10,196,300	7,384,300
29,002	0
13,190,806	14.210.866

(unit: UM)

Charge for refrigeration	288,340	29,002	0
Leasing fee for dealers	10,894,779	13,190,806	14,210,866
Storage fee for fishers	12,212,000	10,452,300	12,151,493
Rental fee of a retail market hall	3,371,124	1,386,000	2,348,898
Rental fee of the commodity building	12,769,026	12,014,239	13,201,041
Other rental fees of facility usage	3,493,219	39,613,588	41,176,480
Revenue from electricity charges	4,169,465	5,036,951	12,482,434
Toll and parking fee	7,202,500	10,421,100	16,316,206
Total	82,006,003	102,340,286	119,271,718

Source: SMPN

Ice sales

Note 1) The primary source of MPN's revenues is a variety of fees charged on the rental and usage of the facilities. MPN has enforced a rule-based facility operation so as to obtain consistent revenues from its users. For instance, as a rule, an access to and parking in the market by vehicles is charged, with a main gate closed for every passage. In the past this was not practiced.

Note 2) Charge for refrigeration in 2012 indicates no revenue for the reason that recently all of the landed catches are shipped on the same day. Thus the refrigerator in MPN has been suspended.

# 2) LIN

ONISPA's budget consists of the government allocation and its own profits gained (such as inspection fees obtained from processing factories). Since the government of Mauritania does not allocate separate budget to LIN, the administration costs of LIN are provided from ONISPA's overall budget. Table 18 shows the details of ONISPA's budget. The costs specific to LIN's administration are indicated in Table 19.

In 2007 when ONISPA was first established, its initial budget was no more than 100,000 UM. The government of Mauritania approved the budgetary allocation in 2008. This enabled ONISPA to launch its operation in 2009.

## Table 18: Total Budget of ONISPA

2007 2008 2009 2011 2012 2010 General expendable 19,700 71,398 103,433 124,433 58,244 n.a items Administrational cost 10,250 66,802 96,796 79,392 99,610 n.a Communication and 9,560 38,090 29,091 31,950 35,851 n.a transport cost Other cost 1.650 3.794 16.411 7.964 4.800 n a Salary 9,185 123,714 171,640 180,026 212,100 n.a. Vehicles and office 49,655 110,259 95,000 82,663 204,738 n.a furniture Total 100,000 386,463 628,871 531,166 501,704 581,410

(unit: 1,000 UM)

Source: ONISPA

Reference: 1 UM = 0.31 yen as of January 2013

			(unit: 1,000 UM
	2010	2011	2012
Salary	155,170	126,357	155,776
Utilities	11,893	11,163	18,829
Communication	6,739	4,595	8,155
Facility maintenance	47,168	28,511	68,989
Repairs of inspection equipment	56,376	14,637	28,938
Expendable items of inspection equipment	22,078	7,906	26,750
General expendable items	3,368	2,847	3,629
Seminars and workshops	80,310	15,158	30,347
Other	155,170	96,357	185,776
Total	383,102	211,175	341,415

#### Table 19: Administrational Costs of LIN

Source: ONISPA

Reference: 1 UM = 0.31 yen as of January 2013

The ex-post evaluation study inquired the Director of ONISPA about the budgetary allocation if it has been sufficient to maintain equipment and facilities of LIN. According to the Director, the quality control of the country's fishery products is currently a primary concern of the government. This helps explain ONISPA has financial stability that allows procurement of necessary expendables and replacement parts. In the past, Nouadhibou Inspection Laboratory obtained more budget than LIN because large commercial fishing ventures in that area need hygiene inspection of their fishery products. Now the government finances the equal amount to LIN. Furthermore, the Strategic Framework of the Fishery and Agricultural Sector Management (2008-2012) places an emphasis on development of hygiene control system to increase exportable fishery products for Europe. This implies the fishery sector continues to be important for the country, and thereby the government will provide sufficient financial resources to LIN.

In addition, EU has funded LIN to strengthen a sensory evaluation of fishery products imported from Mauritania.

In light of the above, LIN anticipates no particular financial problem in its future operation.

## 3.5.4 Current Status of Operation and Maintenance

## 1) MPN

MPN, first constructed with the Japanese grand aid in 1996, completed its rehabilitation through this project in March 2006. Although the overall facilities have some deterioration over years, the renovated fish handling sections (the fish market hall), as well as washable floors, walls and ceiling are mostly well maintained. This has enabled immediate and hygiene handling and shipping of landed marine products.

On the other hand, an ice machine provided in dealers' booth area is not properly operating. Users are unsatisfied with the situation in which they are required to pay for their booths that provide inadequate services. In addition, temporary carry-in sites of pelagic fish need extension to receive increasing daily catch. Storage facilities for fishing gear of small-scale fishers (provided with the Japanese grant aid in1996) are also in shortage. This is associated with a growing number of pirogues landing the catches in MPN.





Fish sorting and grading in a dealer's booth



Fish cleaned and packed in a processing factory

The ex-post evaluation study identified some unsanitary conditions in the surrounding areas of MPN (including seashore and retail stores), though they were not part of the project site. Some kinds of instruction should be provided to make market users more aware that common areas in and around MPN need to be kept in a clean and sanitary condition. Also, in the beneficiary survey, many processing factories indicated urgent needs of a treatment facility and sewerage system to deal with waste water discharged from their daily operation. Currently, they must transport reserved waste water to designated disposal sites (desert areas distant from the urban districts). In the survey, majority of the factories made a strong request for a practical solution to this problem.

## 2) LIN

The field study of the ex-post evaluation revealed LIN has generally good maintenance of laboratory equipment provided by the project, and sufficiently supplies expendable items and replacement parts. It suggests the laboratory can sustainably operate its hygiene inspection of fishery products, water quality analysis, and assessment of hygiene management of processing factories.

From September to November 2011, the Follow-up Study of this project was carried out to monitor the conditions of LIN facilities. Based on its findings, the following supplemental equipment and repair works have been provided. All the necessary repair works will be completed by the end of FY2013 (with a total estimate cost of 36,398 thousand yen).

(1) Name of equipment		
Biological microscope		
Phase-contrast microscope		
Ice machine		
TOC analyzer		
Gas chromatograph		
High performance liquid chromatography		
Post-column ion chromatography		
Atomic absorption spectrophotometer		
Ultraviolet and visible spectrophotometer		
(2) Repairs		
Adjustment of natural lighting system		
Replacement of air conditioners		
Repair of water leakage in an extraction laboratory		
Replacement of fans of draft chambers		

Considering the overall circumstances mentioned above, the ex-post evaluation concludes LIN has no significant problem in its management, skills and finance with respect to facility maintenance. In MPN, however, some problems have been observed in its maintenance management including the technician's skills and know-how in checkup and repair of its facilities. Therefore, the sustainability of the project effect is fair.

# 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The primary objective of this project was, by rehabilitating Nouakchott Fish Market (MPN) and constructing a Nouakchott Inspection Laboratory (LIN), to enforce proper handling of fishery products landed in MPN pursuant to hygiene standards of Mauritania and carry out hygiene inspection of those products exported to Europe. This objective has

been consistent with Mauritania's development policies as well as urgent needs in Nouakchott area to strengthen the quality control system in response to an increasing fishery export. Therefore, the relevance of the project was high both at the time of the planning stage and the ex-post evaluation.

The project has enabled MPN's proper handling of fishery products in compliance with the hygiene standards of Mauritania. The export volumes for European Union (EU), which the project's indicator to assess its effectiveness, reached 3,762 tons in 2007, exceeding a target annual amount of 3,000 tons. LIN is also properly operated in issuing sanitary certificates of exportable fishery products and accrediting fish processing factories. In 2009, the laboratory undertook more than 4,000 cases of testing and inspections of fishery products, exceeding the project's target value. Not only contributed to the local economy of Nouakchott, an increase in the fishery exports has benefited small-scale fishers, dealers and retailers, making a positive impact on living conditions of these end beneficiaries. Therefore, the effectiveness and impact of the project are high.

The project cost and period are both within planned values, therefore its efficiency is also high. As for its sustainability, while LIN properly operates and maintains its facilities, MPN has some problems in facility maintenance, including a technician's ability in checkup and repair of equipment. Thus, the sustainability of the project effect is fair.

In light of the above, this project is evaluated to be highly satisfactory.

# 4.2 Recommendations

- 4.2.1 Recommendations to the Executing Agency
  - The ice machine in MPN is not functioning properly. According to fish dealers and users of the market, ice production is not sufficient to meet the demands, though the private ice suppliers are providing the service. Moreover, they feel various rental fees of the market facilities rather expensive considering less good quality of services provided by the MPN than before. There is no simple way to remedy every difficulty pointed out, but then MPN should at least seek for more communication with its users to work on better service provisions. In replacing the aforementioned ice machine with a new facility, the technician requires relevant training to improve his maintenance skills.
  - Processing factories expressed their desire to have a waste water treatment plant. With a growing fish exports, the waste water discharges are actually increasing. For sanitary reasons, MPEM<sup>13</sup> needs to address this problem.
  - MPN serves to sustain livelihoods of socially vulnerable people, such as small-scale fishers, women retailers and repairers of pirogues. MPEM should enable these key

<sup>&</sup>lt;sup>13</sup> Inland areas located within 200 m from the coastline are under MPEM's jurisdiction, and thus it is responsible for taking countermeasures against the waste water problem.

stakeholders to participate in the development process of the local fishery.

4.2.2 Recommendations to JICA

MPEM and SMPN are planning to replace MPN's ice machine provided by the project eight years ago. This calls for JICA to share with these agencies about how they dismantle the existing machine and associated apparatus.

## 4.3 Lessons Learned

The project was intended to improve hygiene management of MPN serving as a critical fish handling point as well as to develop analytical capacities of LIN which plays a leading role in fish inspection. These facilities are of vital importance to give Mauritania's exportable fishery products quality assurance pursuant to the hygiene standards of the country. The project has facilitated LIN's fishery product inspection and accreditation of fish processing factories with rule-based criteria. Currently, Nouakchott exports to EU an increasing volume of fishery products that meet the hygiene standards.

In response to such fishery export increase, LIN obtained ISO/IEC 17025(2005) in January 2013. This was achieved as a result of its effort to improve the quality of inspection through a UNIDO's program implemented since 2010. The certification is valid for four years, and another assessment will be subsequently given once within a two-year period. Renewal of the accreditation will require LIN to demonstrate its consistent practices for high quality analysis. This is serving as an incentive for the laboratory to continuously develop its management system and the inspectors' technical capacities. To increase sustainability of institutions and technical operations in other similar projects, their design phase may incorporate efforts to meet international standards of products and services, which requires periodical assessment undertaken by third-party organizations.

As mentioned above, on the other hand, more processing factories are concerned with a waste water problem. Many of them indicated pressing needs of sewerage system that covers the entire coastal areas in which MPN, LIN and processing factories are operating. In other projects intended for the fishery sector, waste water from seafood processing can be a common problem associated with an increase in global fish exports. Therefore, while focusing on value chains of local and export fishery markets, of equal importance is considering and conserving the natural environment in which they are operated.

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