

終了時評価結果要約表（英文） Summary of the Terminal Evaluation

I. Outline of the Project		
Country : Tunisia		Project title : Project for Sustainable Management of Coastal Fisheries Resources in the Republic of Tunisia
Issue/Sector : Fisheries-Fisheries Resource Management		Cooperation scheme : Technical Cooperation Project
Division in charge : Field Crop Based Farming Area Division 2, Rural Development Department		Total cost (estimated at evaluation) : 518 million yen
Period of Cooperation	From June 22, 2005 to June 21, 2010 (5 years)	Partner Country's Implementing Organization : DGPA (General Direction of Fishery and Aquaculture), AVFA (Agricultural Extension and Training Agency), INSTM (National Institute of Marine Sciences and Technologies), CRDA (Regional Branch for Agricultural Development), APIP (Ports Fishing and Facilities Agency), GIPP (Inter-professional Organization of the Fishing Products), UTAP (Tunisian Agriculture and Fisheries Union)
		Supporting Organization in Japan : None
1 Background of the Project		
<p>Coastal water of southern Tunisia, especially the Gulf of Gabes, are known not only as good fishing grounds but also as important nursery grounds of fish juveniles in the Mediterranean sea where seagrass bed develops well. However, recently overfishing and destruction of seagrass bed have been caused by illegal fishing, and consequently catch of demersal fish has dramatically decreased in the region. Livelihoods of some 22,000 fishers and those who engage in related industries are threatened by the rapid decrease of capture production particularly in the Gulf of Gabes.</p> <p>The Government of Tunisia has prepared the 10th National Development Plan (2002-2006) with high priority on balancing fishing efforts and exploitable resources quantity, and administrated a series of restrictive regulations concerning fishing operations and fishing efforts. Nevertheless, few tangible results had been attained because cooperation system among fisher's organization, local people and the governmental organizations was insufficient and practical actions taken to conserve/ rehabilitate the environment of fishing grounds has not been very effective. In addition, the restrictive regulations were not complied due to lack of practical measures to supplement the fishers' income against the fishing control, such as assuring supplementary income sources to sustain fishers' livelihoods.</p> <p>In order to solve these problems, the Government of Tunisia and JICA together has initiated the Project which aims to propose the desirable management of fishing grounds and its implementation framework to achieve the sustainable use of fisheries resources, with participation of fishing communities, so that the fishers' livelihoods be sustained and stabilized. The fundamental framework of the Project was agreed between the Tunisian and the Japanese governments according to Record of Discussion (R/D) and Minutes of Meeting (M/M) signed on March 10, 2005. The Project has been implemented since June 2005 and will be completed June 2010.</p>		
2 Project Overview		
(1) Overall Goal		
Models of coastal fisheries resource management for sustainable use of demersal fish (note 1) are adapted around the southern coastal zone of Tunisia, with participation of fishing communities.		
(2) Project Purpose		
Models of coastal fisheries resource management for sustainable use of demersal fish (note 1), are developed in the selected project sites, with participation of fishing communities.		
(3) Outputs		
<ol style="list-style-type: none"> 1) Conservation and rehabilitation of seagrass bed is demonstrated with participation of fishers in the selected project sites. 2) Experimental activities of stock enhancement are promoted. 3) The plan to diversify income source of fishers is elaborated on the basis of project activities. 4) Technical exchanges with neighbouring countries are promoted to practice the coastal fisheries resource management. 		
(4) Inputs		
Japanese side :		
1) JICA Expert: total 9 fields 12 persons, 2) Trainees received in Japan: 9 persons, 3) Provision of equipment: 29.6 million Yen (as of November 2009, 4) Local cost expenditure: 81.8 million yen		
Tunisian side :		
1) Counterpart: a project director, two project manager, and 19 counterparts, 2) Local Cost: 1,748,725 Tunisian Dinar, 3) Provision of land and facilities: office space and others		

II. Evaluation Team		
Members of Evaluation Team	1) Team Leader:, Mr. Shunji SUGIYAMA, Senior Advisor, Japan International Cooperation Agency (JICA) 2) Fisheries Resources Management, Mr. Naofumi AZENO, JAPAN NUS Co., Ltd. 3) Project Planning: Mr. Hiroyuki TANAKA, Assistant Director, Field Crop Based Farming Area Division 2, Rural Development Department, JICA 4) Evaluation Analysis: Mr. Isao DOJUN, Chuo Kaihatsu Corporation	
Period of Evaluation	From November 30, 2009 to December 23, 2009	Type of Evaluation : Terminal
III. Results of Evaluation		
3-1 Achievement		
(1) Output		
1) Output 1: “Conservation and rehabilitation of seagrass bed is demonstrated with participation of fishers in the selected project sites.” Indicator 1) Area of protected seagrass bed is expanded in the selected coastal waters of the project sites. (142.6 km ²) The total protected area is 505.5 km ² at present and this area has far exceeded the original target (142.6 km ²). Indicator 2) Fishers continuously participate in the planning and implementation of the conservation and rehabilitation of seagrass bed. Many fishers participated in these activities through either financial contributions or provision of in kind support (e.g. free labor for the construction/ installation of ARs). Total number of ARs installed is 5,103 units at the time of this terminal evaluation. Fishers continuously participated in these workshops. Aggregated number of participating fishers is 1838.		
2) Output 2: “Experimental activities of stock enhancement are promoted.” Indicator 1) The number of released fry is increased. (40,000 per year) Sea bass and sea bream were selected as target species for fry release and the number of fry produced has reached the target of 40,000 fry per year. Indicator 2) The number of species for which the considerable experiences are accumulated for fry production. (4 species) Fry production capacity of INSTM Monastir has been enhanced and it is now capable of producing a target volume of 40,000 sea bass and sea bream fry. As for fry production of additional species, sole and dentex were selected and technical development of broodstock rearing has been started, albeit remaining technical challenges for fry production of sole and dentex. Indicator 3) 3 manuals are prepared: manuals on fry production, releasing techniques and evaluation of releasing effects. 3 manuals were prepared.		
3) Output 3: “The plan to diversify income source of fishers is elaborated on the basis of project activities.” Indicator 1) Seminars for diversification of income resource of fishers are held continuously. Seminars were held 8 times since August 2006. Indicator 2) Experimental area of aquaculture is expanded. (2 experimental sites) An experimental culture of clam had been carried out at Zarrat. After completion of clam experimental culture in Zarrat, a pilot project of clam culture in Akarit have been started. Experimental culture of sponge is on going at Kerkennah. Indicator 3) The plan to diversify income source of fishers is made up by target fishers’ groups and governmental bodies. A report on the income source diversification plan is under preparation based on the experiences of the experimental culture on clam and sponge. This report will be finalized by the end of the project period.		
4) Output 4: “Technical exchanges with neighbouring countries are promoted to practice the coastal fisheries resource management.” Indicator 1) Tunisia introduces the coastal fisheries resource management to neighbouring countries several times. A regional seminar was held in June 2009 with the purpose of disseminating the results of this project to neighbouring countries. A total of sixteen participants, who are fishery administrations, fishery research institutes, and representatives of fisher’s organizations were invited from Algeria, Egypt, Morocco, Mauritania and Italy. Approximately seventy Tunisian stakeholders also participated in the event.		

(2) Project Purpose: “Models of coastal fisheries resource management for sustainable use of demersal fish are developed in the selected project sites, with participation of fishing communities.” (Note 1) In this Project, “Model of coastal fisheries resource management” indicates the comprehensive approach model for management of fishery grounds through multiple activities (such as control of illegal fishing operations, stock enhancement, environmental protection, encouragement of participation by fishers and community) for the purpose of sustainable use of resources and betterment of the livelihoods of fishers.)

Considering the degree of fisher’s participation into decision making process in coastal fisheries resource management, and observation of fisher’s attitude positive changes including self-discipline manner, and the effectiveness and future potential in applying following approaches on coastal fisheries resource management, it is considered that the achievement level of the Project Purpose is satisfactory.

1) Conservation of seagrass and fishery grounds by installing ARs, 2) enhancement of fish stock through fry production and fry release activities, 3) income source diversification (clam and sponge culture, study on the possibility of seafood processing.

Indicator 1) Meetings are regularly held for co-management between fisher’s organizations, local communities and governmental bodies to jointly plan, implement and evaluate the coastal fisheries resource management.

Fifty seven workshops and seminars have been held with participation of fishers. More workshops are planned in the remaining period of the Project and are to be expanded outside the project sites.

Indicator 2) Fishers act in self-disciplined manner for rehabilitation of seagrass bed and reservation of coastal fisheries resource.

Some fishers in Ajim have changed their fishing method from trammel net to hook and line fishing in the areas around the installed ARs. Some women start to release caught small size clam.

3-2 Technical Issues

3-2-1 Conservation and rehabilitation of seagrass bed

The ARs installed by this project are expected to bring positive effects for seagrass bed conservation as they work as a deterrent for illegal fishing operations in seagrass bed areas. Inhabitation of octopus and their spawning in the ARs were reported. This suggests that the installation of ARs has some positive effects for fisheries resource conservation purposes. However, excessive and unregulated installation of ARs may have a negative impact, it is necessary that government agencies including research institute continuously monitor the possible ecosystem disturbance caused by ARs. Although the Project has yet to verify the technical feasibility of replanting method, it highlighted the difficulty of seagrass bed rehabilitation, which brought about renewed recognition among project counterparts of the importance of preserving existing seagrass bed areas. Such recognition was reflected in the project work plan which concentrated its efforts for seagrass bed conservation related activities in the later stage of the Project.

3-2-2 Stock enhancement

Fry production of two target species, sea bass and sea bream has achieved the expected outputs. The institution in charge of this activity (i.e INSTM) does not have any technical difficulties in doing so. However, development of fry production techniques for sole and dentex, is still underway.

In order to increase reported case of recapture of released fries, further efforts for information dissemination on this programme to fishers and middlemen and improvement of the assessment of fry release programme effects (suggested indicators are sex, gonad weight, and degree of maturity) are required. Usually fry release programmes are conducted for two objectives: 1) contribution to reproduction, and 2) increased fish catch. There is a reported case of recapture of released sea bass, which was weighed at over 1,300g. This suggests that the fish has reached the size of reproduction. In order to obtain good effect of fry release programme, implementation of fry release programme including fishery management and its monitoring would be required.

Tunisian counterparts can conduct with their initiatives the release programme as a mean of the awareness raising and this awareness raising activity is expected to be continued.

3-2-3 Diversification of income sources

The results of experimental cultures of clam and sponge suggest possibility of these aquacultures. In order to facilitate proper planning of the promotion of income generating activities, the current economic status of fishing households need to be known and local conditions under which what type of income generation activities are possible need to be described.

3-2-4 Changes in fishers’ attitude

There are a number of behavioral/attitude changes in fishers. The followings are some examples of positive changes in fishers’ behavior and attitude.

1) Fishers have participated in the decision making process such as selection of ARs installation sites in collaboration with administrative bodies, 2) Fishers in Mahares made financial contributions for the transportation and installation of 110 units of ARs, 3) Fishers in Zarrat ()donated from their fishing production income to install ARs (approx 1,000 units at around 340 tons). For this operation, 95% of 350 fishers participated,

4) Fishers in Zarrat modified the design of ARs in order for ARs not to be dragged by illegal trawlers (AR unit weight from 200 kg (JICA type) to 1.0 tons, 5) Fishers in Ajim made donations (in the form of fresh fish) to construct and install ARs (approx 120 units), 6) Fishers in Ajim obtained around 50,000 US dollars from UNDP to install ARs, 7) Some fishers in Ajim have changed their fishing method from trammel net to hook and line fishing. Hook and line fishing techniques are considered to be one of the environmental-friendly fishing methods because small-size fish may not be caught. 8) Fishers in Ajim in collaboration with coastal guard authority have started surveillance activity against illegal fishing. When fishers discover the presence of illegal fishers, they report it to the coastal guard authority.

3-2-5 Changes in government officials' attitude

There are a number of attitude changes within government officials and the followings shows some examples of positive changes in government officials' attitude.

1) Government officials have adopted a participatory process of decision-making in the project activities such as installation of ARs. 2) The 4th and 5th year's activities of the Project have been implemented using almost exclusively financial resources from the Tunisian side. 3) CRDA Sfax took a leading role in modifying the design of ARs (700 kg) in Kerkennah in order to prevent large size illegal trawl operations. 4) In Ajim, active participation of the senior municipal government officials in the project activities was observed. 5) In Zarrat, municipal mayor is actively promoting environmental conservation activities and supporting fishers in this area by participating fishers' meetings and suggesting his opinions.

3-2-6 Expansion of the results of the Project

One of the remarkable results of the Project are the positive changes of attitude and behaviors of fishers, administrative bodies, and research institutes and also creation of collaborative relationship among them. It is very important to retain and expand this relationship for promoting effective fisheries resource management in Tunisia.

3-3 Summary of Evaluation Results

(1) Relevance: High

In the southern area of Tunisia, fisheries and agriculture are primary means of livelihoods. However, due to overfishing and prevalence of illegal fishing operations, fishery resources have been decreasing and capture production has also shown a declining trend. Conservation of fishery resources and its sustainable development are thus regarded as important subject by the Government of Tunisia. The aim of the Project is consistent with the JICA's focused issues. Introduction of participatory approaches by the Project made positive effects on fishers and Tunisian counterparts for active participation into fisheries resource management.

(2) Effectiveness: High

As mentioned earlier, several approaches to fisheries resource management (conservation, enhancement, and diversification of income sources) have been practiced and reviewed. As a result, the effectiveness or the future potential in applying these approaches on coastal fisheries resource management has been confirmed. Based on these approaches, some models of coastal fisheries resource management have been practiced. It is considered that the degree of the achievement of the Outputs and the Project Purpose is at a high level.

(3) Efficiency: Satisfactory level

Important factors which contributed to the efficiency of the progress of the project activities are good cooperation and collaboration among governmental and professional organizations, researchers, and fishers. By applying a participatory approach, fishers in the project sites contributed very actively in the project activities. Training in Japan had also good effects not only for the enhancement of the knowledge of counterparts but also for better envisioning of future courses of action.

(4) Impact:

There is a possibility to achieve the Overall Goal in the future. Many positive impacts are observed.

Main positive impacts are 1) a significant number of ARs installed in the areas outside of the project sites, 2) Tunisian side has started a two year pilot project on clam culture as a next step before its extension, 3) various positive changes in attitude and behaviors of fishers and governmental officials.

(5) Sustainability

It is envisaged that sustainability of Tunisian efforts on coastal fisheries resource management will be ensured in view of the policy, institutional commitment, and technical capability of Tunisia.

1) Policy aspect

Conservation of fishery resources and its sustainable development are thus regarded as important subject in the 11th National Development Plan (2007-2011) that includes the Agricultural Development Plan.

2) Institutional and organizational aspect

Organizations participating in the Project are administrative organization, research institutions, and professional organizations that have clearly defined roles and responsibilities for the development and promotion of the fishery sector using firm institutional and organizational structures. There has been an established cooperative and collaborative relationship among these organizations. Currently the Joint Coordination Committee meetings of the project serve as coordination/consultation mechanism, however it is not a formal arrangement that remains functioned after the completion of the project period. In this regard, it is necessary that a formal inter-agency coordination/consultation mechanism for coastal fishery resource management be established.

3) Financial aspect

The Tunisian counterpart agencies have allocated sufficient funds for the project. The majority of the project activities in the last two years of the project period in particular have been conducted with financial resources from the Tunisian side. It is expected that sufficient funds for the project will be allocated continuously.

4) Technical aspect

At the later stage of the project period, many project activities are conducted with minimum technical inputs from the JICA experts. Most of Tunisian counterparts are expected to remain in their respective organizations.

3-4 Factors that promoted realization of effects

(1) Aspect related with project planning

None

(2) Aspect related with implementation process

1) Enhancement of motivation of persons involved in the Project

In addition to the positive changes of attitude and behaviors of persons involved in the Project by introduction of the participatory approach, visits to the project sites by media reporters and minister of agriculture and also visitors from foreign countries have made positive effects on the motivation of fishers and counterparts organizations indirectly.

2) Activity on seagrass beds rehabilitation

As a result of seagrass beds survey which had been carried out in first year of the Project, it is identified that main cause of loss of seagrass bed areas was reduction of transparency of sea water due to pollution. Because it will be difficult to increase seagrass beds where already seagrass had been disappeared and water transparency is low, and also techniques on seagrass rehabilitation in Japan can not be applied directly in Tunisia, main focused activities were sifted from the seagrass rehabilitation to conservation of seagrass beds and fishery grounds, and them conservation activities have been expanded. It can be said that this change was appropriate.

3-5 Factors that impeded realization of effects

(1) Aspect related with project planning

1) Fry release

It was supposed to renovate fry production facility for producing and releasing 200,000 fries annually before the start of the Project. However, it was known at the initial stage of the Project that maximum capacity for fry production at INSTM Monastir was around 50,000 fries per year due to limitation of water intake capacity and area for such facility. Consequently, renovation of facility had been done for producing 50,000 fries. Accordingly, fry release activity is regarded as an experimental activity.

2) Technical transfer on sea food processing

Duration of dispatch of Japanese expert in this field was 1.0 month and this duration was short to produce necessary outputs. In the later stage of the Project, a study on possibility on sea food processing was conducted and prepared a report. This report becomes a basis for future actions.

(2) Aspect related with implementation process

Number of counterparts who are assigned officially and quasi-officially is sufficient one. However, there are cases that official counterparts have engaged in the project activities in limited manner and other staff has engaged in the project activities substantially. In such case, technical transfer to official counterparts became limited scale.

3-6 Conclusion

As reported above, the majority of the project purpose/outputs indicator measurements show high degrees of achievement. It is hence highly expected that the project purpose will be met within the planned project period. In addition to the production of expected project outputs, it is observed that the project induced some qualitative changes to the key stakeholders of the project in a positive way. Based on the assessment/analysis of the project

achievements above, the Joint Evaluation Team has concluded that it is appropriate to terminate the Project as planned in the R/D.

3-7 Recommendations

It is recommended that counterpart agencies, together with JICA experts will exert due efforts on the following actions:

(1) Establishment of a formal inter-agency coordination/consultation mechanism for coastal fishery resource management

For the successful management of fisheries resources, concerted efforts on policy guidance, supportive legislative arrangement, research work, training/extension, stakeholder consultation, organization of collective actions, inter alia, are required. In Tunisia, provision of such services is divided among several governmental agencies and professional organizations namely DGPA, INSTM, AVFA, UTAP, GIPP, CRDAs and any other related organization such as CTA. It is hence fundamental that a coordination/consultation mechanism among these agencies is established so as to facilitate all the planning and implementation process of fishery management is conducted in a coordinated and consultative manner. Currently the Joint Coordination Committee meetings of the project serve for this purpose, however it is not a formal arrangement that remains functioned after the completion of the project period. In this regard, it is strongly recommended that a formal inter-agency coordination/consultation mechanism for coastal fishery resource management be established.

(2) Record of qualitative changes of attitude of stakeholders as positive effects of the project

Some of the qualitative changes of attitude of stakeholders have been observed by the evaluation team and described in this report (see the sections 5.5 and 5.6), it is suggested that the collection of this type of information be continued.

(3) Compilation of project experiences

The Project accumulated considerable degrees of knowledge and experiences on resource management approaches through its field activities. Such valuable knowledge and experiences include 1) effective use of ARs for resource management and conservation, 2) fish fry release for resource enhancement, 3) cooperation among governmental agencies and fishing communities, 4) better utilization of tidal resources etc.

When these types of information are compiled and properly documented, they will be of great use for national purposes (further expansion/enhancement of fishery resource management) and at the same time they serve as valuable reference information for those countries that share similar fisheries management problems. It is hence recommended that the project exert efforts to compile project results and publish as reference documents. The documents can be in the national/regional language (i.e. Arabic), but inclusion of executive summary in French would attract wider attention to those documents.

(4) National seminar(s) to inform all the stakeholders of the project results

A key of successful implementation of the project seems to be the active participation of fishing communities in the project activities. Fishing communities as an important actor of fisheries resource management need to be properly informed of the consequences of their action, namely outputs of the project. It is equally important that they are fully involved in the process of determining the future course of action to be followed after completion of the project. In this connection, it is recommended that the project will organize (a) national seminar(s) with the following purposes.

- To disseminate the results of major project activities to the key stakeholders
- To discuss future course of action that follows up the project activities

(5) Publicity of the project

Upon organization of the national seminar stated above, a press release should be prepared for better public recognition of the project activities.

(6) Comprehensive fisheries management in the Gulf of Gabes

The Project has implemented various management measures in the five project sites. It can be said in a sense that they are the field-testing of individual management measures in the site specific conditions, which contributed to 'landing site based management of fisheries (cluster management). This is of course an important step forward comprehensive management. However, there would be the cases where cluster management and/or separate application of single management measure have a limitation. For example, if one fishing ground is used by fishers from two different landing sites, management of this fishing ground has to inevitably involve fisher groups of both landing sites. Another example is that upon implementation of, say, a closed period for fishing in poor fishing communities, provision of alternative income source may need to be combined with the fishing regulation in order to minimize the negative economic impacts on fishers' livelihoods.

It is natural that fishers and government authorities consider the prevalence of illegal fishing operations as the

issue of highest priority. However, excessive attention on this issue may mask the another important issue, whether current practices of fishing operations by ordinary (legal) fishers are adequate and/or whether current level of fishing efforts is appropriate considering the status of fisheries resources at present. If current practices of fishing operations by ordinary fishers are also causing overfishing, addressing the problem of illegal fishing alone may not be sufficient in terms of management of fisheries resources in the gulf of Gabes.

Considering above views, the next step to follow-up the project activities would probably be to establish a comprehensive management framework to cover entire areas of the Gulf of Gabes, which may comprise the following activities;

- Study of socio-economic status of fishing communities, which helps to evaluate the viability and social implications of planned fishing management measures
- Annual assessment of the fisheries resource status (for selected species of high commercial importance), which indicates the necessity of management actions. This will be conducted by utilizing existing sets fishery information and statistics.
- Periodical review of existing fishery regulations, which identify the needs of revising some regulations (e.g. duration of closed period for fishing, minimum sizes for commercially important species, etc)
- Establishment of guidelines for the use of ARs, which ensures proper and regulated use of ARs
- Enhancement of participatory decision-making process for fisheries management, which encourages more involvement of stakeholders in the process of planning, implementation, evaluation and revising of fisheries management plans
- Formulation of overall fisheries management plan for the Gulf of Gabes, which comprises of a number of cluster fisheries management plans (regional/local)
- Integrated implementation of fisheries management measures, which will be combined with complementary income source diversification programmes and/or stock enhancement programmes

3-8 Lessons Learned

(1) Record of qualitative changes of attitude of stakeholders as positive effects of the project

For the proper monitoring/assessment of the fisheries resource management work, measurement of quantitative achievements such as 1) areas under management, 2) number of ARs installed, and 3) the increase of catch, etc. may not be sufficient. The sustainable implementation of management activities would inevitably require behavioral/attitude changes of the key stakeholders and in this regard, it would be worthwhile to monitor and record qualitative changes made to the key stakeholders of the project. Such information will serve as very useful reference information when fisheries management is extended to other areas.