

# The Enhancement of Sustainability in the Mangrove Forest Management of Saloum Delta In the Republic of Senegal

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## 0. Summary

The Relevance of the project is high, as it is consistent with both the Senegalese development policy and development needs as well as Japanese aid policy. Also, the Efficiency is high as the elements of the Inputs are appropriate, and no problem can be seen in terms of duration and cost. On the other hand, as for the Effectiveness, due to the insufficiency in clarity and measurability in the Project Purpose, the Project Purpose cannot be determined to have been achieved. Regarding the Impact, although the Overall Goal has not been achieved, significant positive impact is observed compared to the situation before the project implementation such as the emergence of; a community spirit in each village, organizational management skills at the village level, a remarkable change of awareness, i.e., self-motivation and positivity, etc., in many target villages. Hence, the Effectiveness and Impact from a comprehensive perspective is judged as medium. The Sustainability is also judged as medium, because, although the sustainability of effects in the target villages is high, the diffusability to surrounding villages is not sufficient from a political, institutional, organizational, and financial perspective. For the above reasons, the evaluation result of this project is high.

## 1. Outline of the Project



(Map of the Project Site)



(The planted Mangrove)

### 1.1 Background of the Cooperation

The mangrove forest in Senegal is a precious ecological system to sustain biological diversity. However, factors such as decreasing rainfall since the 1970s and illegal deforestation by residents in surrounding areas have degraded and decreased mangrove forests which in turn has negatively influenced the resources required to sustain people's

lives as well as related industries which involve forestry, marine and tourism and has contributed to the deterioration of the environment.

In order to cope with this situation, the Senegalese government requested the cooperation of the government of Japan to investigate the sustainable management of mangrove forests in Petite Côte in The Region and Saloum Delta in Fatick Region located in mid-west of Senegal. In response to this request, the Japanese government implemented a JICA Development Study “The Survey on the sustainable management of mangroves in Petite Côte and Saloum Delta in the Republic of Senegal” from December 2001 to March 2005 for the purpose of planning a project for sustainable management of mangrove forests. In this survey, mangrove forests were categorized into two zones, conservation zone and restoration zone, and a pilot project was implemented. The results of the pilot project were reflected in specific plans for the conservation of mangrove forests. The plan also considered income-generation for the villagers by combining activities for income-generation and planting mangroves.

The government of Senegal requested the Japanese government to implement this project as part of its ongoing cooperation based on the above development study, and a Record of Discussions (R/D) was signed between the two governments on August 2005. JICA started this project on November 2005, in the form of subcontracting with JAFTA, Japan Forest Technology Association.

## 1.2 Outline of Cooperation

Overall Goal		Create the chance to know how to improve the living conditions of the population in the target area as the result of the sustainable management of mangrove forests.
Project Purpose		The population of targeted villagers will be enabled to utilize and manage the mangrove forest resources in a sustainable and diffusible manner.
Outputs	Output 1	1. The Population of targeted villages can regularly carry out their activities and use a part of the profits from these activities in order to conserve and to restore the mangrove forest.
	Output 2	2. The consciousness of the staff of administrators and the technical officers who lead the population will be raised.
	Output 3	3. The short and mid-term activities necessary to achieve the objectives for the sustainable management of mangrove forest resources will be well defined.
Inputs (achieved)		[Japanese Side] 1. Dispatch of Experts 5 persons (Total 33.5M/M)

	<p>Long-term Expert 1 person</p> <p>Short-term Expert 3 persons</p> <p>2. Training of Counterparts in Japan 3 persons</p> <p>3. Third-country Training None</p> <p>4. Supply of Equipment Yen 4,770,000 (photo copy machine, PC, printer, fixed separator, hanging scale, etc.)</p> <p>5. Local Cost Yen 121,130,000</p> <p>6. Others (dispatch of final evaluation team, renovation of project office with the budget of JICA Senegal Office in FY2005)</p> <p>[Senegalese Side]</p> <p>(1) Disposition of Counterparts 8 persons</p> <p>(2) Preparation of land and facilities Project Office</p> <p>(3) Local cost (only FY2007) FCFA 192, 500, 000</p>
Total Cost (Japan)	251,958 thousand yen
Duration	November 2005 ~ March 2008 (2 years and 4 months)
Counterpart Organization, etc.	Department of Water, Forests, Hunting and Soil Conservation, Ministry of Environment, Protection of Nature, Reservoirs and Artificial Lakes (Counterpart Organization), Department of Marine, Economy, Fishery and Aquaculture (Collaborative Organization in fishery field)
Collaborative Organization (Japan)	Japan Forest Technology Association (JAFTA)
Related Surveys and Projects	Sustainable Management Plan of Mangrove Forest, Development Study on Sustainable Management of Mangrove Forest in Petite Côte and Saloum Delta in Senegal ( JICA Development Study 2001.12-2005.2 ) , Dispatch of Follow-up Expert of Advisor for Sustainable Management of Natural Resources in Senegal (JICA 2008.9-2009.11), USAID/Wula Nafaa Project II (USAID 2009-2014)

### 1.3 Outline of Final Evaluation

#### 1.3.1 Probability of achieving Overall Goal at the Final Evaluation

It is indicated that the Overall Goal would be achieved to some extent, if support to monitoring and sustainability is appropriately provided and the Environment Fund functions properly. Relevant impacts also included; activated technology transfer at the villagers' level in and out of the target villages, emergence of new leaders through institution-building activities and an increase in cash income by improving existing

technology.

### 1.3.2 Probability of achieving Project Purpose at the Final Evaluation

It was judged that Project Purpose was almost achieved for the following reasons; 1) the Environment Fund had been set up in all the target villages, 2) the Environment Fund had been utilized at 2 of the 11 target villages, and 3) in the 9 remaining villages, the percent of profits to be given to the Environment Fund had been decided and utilization of the Fund could start as soon as any income was gained from the activities.

### 1.3.3 Recommendations at the Final Evaluation

The following recommendations were made.

- (1) Setting Framework of support by the Forestry Department in Dakar for securing sustainability
- (2) Securing substantial Personnel and Budget for (1) above and continued assignment of the Assistant Coordinator
- (3) Setting up a Coordination Committee consisting of concerned authorities which would include the Marine Department, and management under the leadership of the Forestry Department
- (4) Periodic Monitoring by authorities concerned including the Forestry Department, as well as clarification and implementation of necessary support
- (5) Support and Coordination based on monitoring of the Environment Fund by the authorities concerned
- (6) Follow-up technical assistance for Apiculture and Fish Cage, etc. by the Coordination Committee
- (7) Monitoring and management of progress by JICA together with the Forestry Department

Most of the above recommendations were not realized at the time of Ex-post Evaluation.

## **2. Outline of the Survey**

### **2.1 External Evaluator**

Mayumi Hamada

Foundation for Advanced Studies on International Development (FASID)

### **2.2 Duration**

Duration of the Survey: January 2011 to January 2012

Field Survey: February 14, 2011 to February 28, 2011

June 16, 2011 to June 30, 2011

### 2.3 Constraints on the Evaluation

Nothing in particular.

## 3. Evaluation Results (Rating: B<sup>1</sup>)

### 3.1 RELEVANCE (Rating: ③<sup>2</sup>)

#### 3.1.1 Consistency with Development Policy

The direction shown by the Project Purpose and the Overall Goal is consistent with the development policy of the Senegalese government from the start till the end of the cooperation period as follows.

Firstly, it is consistent with the Poverty Reduction Strategy Paper (2003-2005, hereinafter PRSP), as well as the Policy on the Forestry Sector (hereinafter PFS) at the time of project commencement. In the PRSP, the Senegalese government recognized “the management of natural resources and environment” as an important sector for long-term development. Also, the PFS, which was enforced in April 2005, indicates that the government would contribute to poverty reduction, meet the needs of people in consistency with the localization policy and maintain the balance between society and the ecology, by management and conservation of forestry resources and bio-diversity in a sustainable manner. Natural resources management, in particular, is recommended to be promoted using a participatory approach with the local population.

On the one hand, at the end of the cooperation period, the project is coherent with the Poverty Reduction Strategy Paper II (2006 – 2010, hereinafter PRSP II), Letter of Policy for Environment Sector (hereinafter LPSE) and the PFS. The PRSP II emphasized the importance of integrating economic growth with social development, based on four major pillars: 1) creation of wealth – for the sake of growth which contributes to poverty reduction, 2) acceleration of access to basic social services, 3) social protection, disaster prevention and management and 4) good governance and participatory and decentralized local development. Among these, the environmental sector is included in 2) above and recognized as important for long-term growth. It includes a description that actions should be taken for capacity development in regards to the sustainable utilization and management of natural resources, because natural resources had been deteriorated due to unsustainable usage. Also, the LPSE set the following five major tasks and objectives in the Forestry Sector; 1) capacity building in regards to the management of natural resources and the environment, 2) adding value from forestry and natural resources, 3)

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<sup>1</sup> Evaluation with 4 level-scale; (A)Very High/(B)High/(C)Partly Problematic/(D)Low

<sup>2</sup> ③: "High", ②:"Medium", ①: "Low"

actions for environmental conservation and prevention of desertification, 4) balancing protecting biodiversity and population's demands, and 5) actions for marine and coastal environment conservation. As for PFS, there has been no change since the commencement of the project.

### 3.1.2 Consistency with Development Needs

The direction shown by the Project Purpose and the Overall Goal is consistent with the development needs from the project commencement to the completion of the cooperation period for the following reasons.

At the start of the project, the content and the direction of the project are consistent with the social needs and the needs of the population for protecting Mangrove forests. The Mangrove forest is a precious ecosystem to maintain biodiversity and Senegal is said to be the northern limit for mangrove forests in North Africa,. Mangrove forests are prominent in, the lagoons, estuaries and the Delta in the southern part of the country encompassing 200,000 ha of mangrove area. In Saloum Delta's 58,300 ha of Mangrove forests spread out in the above area. Also, in addition to the function of providing construction materials, firewood and charcoal, and producing non-timber forest products such as honey, dyes such as tannin, medicine, and alcohol, mangrove forests nurture marine resources, protect coastal erosion and sediment run-off, purify water, conserve air quality and protect ecosystem (wild animals, birds and plants). The degradation and decrease of mangrove forests which provided such a variety of significant functions has been a serious problem, and its sustainable management has been an important task. Moreover, it was shown in the preceding development study that the local population was fully aware of the devastation of mangrove forests and the significance of its conservation.

At the time of the completion of the cooperation period, the content and the direction of the project were consistent with the development needs, as there had been no change in the significance of mangrove forests in terms of its importance to the ecosystem, its various functions as well as its sustainable management.

### 3.1.3 Consistency with Japan's Aid Policy

The direction of the Project was consistent with Japan's aid policy at the time of Ex-ante Evaluation for the following reasons.

At the time of planning, it was indicated in Japan's ODA Data Book that the environment sector including desertification protection is one of Japan's priority sectors in supporting Senegal, with which the project direction is consistent.

For the above reasons, the Relevance of the project is high, because implementation of the project is fully consistent with the development policy of the Senegalese government, the development needs of Senegal and Japan`s aid policy.

### **3.2 EFFECTIVENESS and IMPACT (Rating: ②)**

#### 3.2.1 Effectiveness

##### 3.2.1.1 Project Outputs (Outputs)

The PDM of the project was revised once. The Outputs of the revised PDM were mostly achieved by the termination of the project, except in regards to the Environment Fund (accumulation and disbursement).

(1) OUTPUT 1 “The population of targeted villages can regularly carry out their activities and use a part of the profits from their activities to conserve and restore the mangrove forest.” Partially achieved.

Although by the end of the project cooperation period the population had acquired necessary skills for the income-generating activities, accumulation and disbursement of the Environment Fund were not sufficiently made by the project termination. The details are as shown below.

##### 1) The level of the acquired skill

As for the level of the skills required for income-generating activities, the villagers at the target villages are regarded to have mostly acquired the necessary skills as of the completion of the cooperation.

At the time of the Final Evaluation, it was judged that the people at the target villagers had acquired the skills of mangrove afforestation, village afforestation, shell culture and processing, glove/boot-making, life jacket production, etc. However, it was pointed out that continued technical support was necessary for the skills related to apiculture and fish cage which were new to the villagers. Meanwhile, according to the questionnaire survey and interviews at the time of ex-post evaluation, the forestry technical officers who were engaged with the project throughout the project implementation period until now recognize that the villagers mostly acquired a sufficient level of skills by the end of the cooperation period. Also, the interview results in all 11 target villages show that the villagers themselves think that they had acquired the skills by the end of the project.

Also, the revenue and profit from income-generation activities at the end of the project is shown in Table 1. Since a certain level of achievement is seen at 10 out of 11 target villages, the skills are regarded to have been mostly acquired by the villagers.

2) Establishment, accumulation and disbursement of Environment Fund

As for the establishment of Environment Fund and the accumulated/disbursed amount of the Fund, the accumulated amount at the time of project completion was 124,489 FCFA, while

**Table 1 The Revenue and Profit from Income-generation Activities at the project completion**

(Unit : FCFA)

	Name of the villages	Revenue	Profit
1	Mbam	448,000	105,000
2	Bassoul	371,000	8,500
3	Moundé	238,500	114,795
4	Kamatane Mbambara	210,000	67,650
5	Dassilamé Serère	189,000	72,720
6	Siwo	127,000	49,350
7	Bangalère	33,400	17,440
8	Gagué Cherif	16,000	6,000
9	Ndjambang	14,500	13,330
10	Djirnda	0	156,000
11	Sangako	0	0
Total		1,647,400	610,785

[Source] compiled by the author with materials provided by JICA

the disbursement was 30,000 FCFA in two of the 11 villages.

However, by the end of the project's duration, an Environment Fund had been established and the percent of the profit to be donated to the Fund (i.e., 25%) was decided in all 11 target villages. Moreover, many of the village organizations were almost functioning (regularly holding meetings, etc.), and the fundamental organizational management skills seemed to have been acquired as of the project's termination.

The reason that the objective concerning the accumulation and disbursement of the Environment Fund was not sufficiently achieved in contrast to the high level of skills acquired by the villagers, can be attributed to the insufficient length allowed for the project's cooperation period, i.e., 2 years and 4 months, rather than indicating that the villagers were having any problems conducting activities. Although technical verification at the village level was made in the target villages by JICA in its preceding



development study, 15 months was too short to verify the feasibility of some activities which require more than 15 months for technology transfer and the harvest cycle. Besides, pilot activities for Environment Fund were not included in the Study. Also, social and cultural aspects of the target villages as well as the time required to build awareness for change and institution building at the time of the study are regarded as being insufficiently analyzed.

In the first place, compared with technology acquisition, solidarity and management capacity as an organization are required for each village to manage Environment Fund and to conserve and restore mangrove forests. Since the population in the target villages used to conduct activities not as a whole village but in small groups (such as all women or all men), it is likely to take considerable time until the institution-building activities produce effects compared to areas which share a basic social background and have solidarity among villagers. Also, it takes a certain period until Environment Fund gets on track after acquiring skills, actually conducting income-generating activities, having revenue, reaching consensus among villagers on the percent of profits to be donated to the Environment Fund, monitoring the progress and modifying activities as necessary. Taking into account the fact that each component (such as income-generation by acquiring skills) needs to be one project, this project would need longer time for producing the planned effects compared with ordinary projects, and sufficient project duration should have been set at the time of planning.

(2) OUTPUT 2 “The consciousness of the staff of local administrations and the technical officers who lead population will be raised.” Almost achieved.

As for the forestry technical officers, appropriate support was given both in terms of quality and quantity during the project implementation period. In that process, the officers’ understanding on the villagers and the project activities was deepened, and their awareness was raised. According to the interview results, the frequency of their visit to the target villages during implementation period ranged from twice a week to once a month, depending on the area and time of the year. This is regarded as being sufficiently frequent for technical officers who are in charge of vast areas. On the other hand, the frequency of visits by the marine technical officers was low. They rarely visited the villages to conduct shell culture and undertake conservation activities, and no substantial contribution can be observed.

There was a comment in the hearing from technical officers that the project lead to the change in their relationship with the local population as it brought about mutual understanding and trust between the technical officers and the population as their

behavior improved with better knowledge acquired through the project activities. Before the project, the forestry technical officers considered the local population as an entity needing control, because they could not understand why the villagers took such unreasonable actions in regards to mangrove conservation.

(3) OUTPUT 3 “The activities and the objective to achieve in the short and middle term for the sustainable management of mangrove forest resources will be well defined.” Achieved.

By the end of the project cooperation period, action plans which cover the project period and three year afterwards were made at all 11 target villages. The content were explained at the village meeting and posted at the sign board at each village.

While the PDM of the project was revised, the specific information was not available concerning with the intension and the reason for its revision. However, the deletion of some outputs and their indicators are regarded to have been mostly appropriate.<sup>3</sup>

#### 3.2.1.2 Achievement of Project Purpose

The Project Purpose (The population of targeted villages will be enabled to utilize and manage the mangrove forest resources in a sustainable and diffusible manner.) cannot be described as being achieved.

(1) Indicator 1<sup>4</sup> ”State of mangrove forest resources in the targeted villages (such as the area of mangrove forest, quantity of fish that are caught, etc.)”: Not recognized to be achieved.

This indicator does not show the area of mangrove afforestation by the project but the total area of mangrove forest in the target villages. The target level is not shown, and the data on the area of mangrove forest of each target village did not exist at either the planning stage or at the time of project termination.

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<sup>3</sup>The deleted outputs in PDM1 are divided into two categories; 1) those which are hard to be monitored and evaluated because of difficulty to collect data (Indicator 1, Output 1 of PDM-1: “The villagers will participate at their own will and risk in the reforestation activities,” and Output 3 of PDM-1 :“The amount of consumed firewood is decreased,”) and 2) those which are unrealistic to be achieved within the project cooperation period (Indicator 2, Output 4 of PDM-1: stipulation of ordinances and laws concerning natural resources conservation).

<sup>4</sup> Although Indicator 2 (capacity of villagers and village organizations) and Indicator 3 (appropriate support and management by local government staff and technical officers ) for Project Purpose are described in PDM-2, they were not utilized in this survey because the former is the same as Output 1 and the latter as Output 2.

The amount presented in the preceding development study on the afforestation plan, (0.25 ha per year for *Rhizophora* and 0.1 ha per year for *Avicennia*) could be used as substitute target level of the indicators as the planned figure for each village. Applying these figures to the target villages according to the activities plan for each village, the total targeted area of afforestation would be 2.79 ha by the project until the project termination for 2.4 years. As the total area of mangrove afforestation by the end of the project was 1.67 ha, this would be about 60% achievement, which is not considered high. However, since the development study's target area includes an area broader than the target villages of this project, it is not clear enough that this figure is sufficiently applicable.

On the other hand, the area of afforestation was not commonly recognized as the major target in the Project Purpose by those who are concerned with the project. Substantially, it seems that conservation (or prevention of deterioration) of mangrove forest and its resources was the intended objective to be reached by ongoing activities. Even in this case, however, data which could be used to verify the achievement of the Project Purpose does not exist. At the completion of project cooperation, data for the amount of fish caught was also not available.

## (2) The relationship between the Project Purpose and the Outputs

As already indicated above, compared with other Outputs, Output 1 includes more items and contains many components, each of which could be an Output or a Project Purpose in other projects, such as institution building of village organizations, technology transfer for income-generation activities, which are also useful for maintaining mangrove forest, and for afforestation, income generation, establishment and management of Environment Fund, etc.

Among these components, acquisition of afforestation skills and institution building of village organizations directly contributed to increasing the area of afforestation, while successful technical transfer for income-generating activities during implementation stage kept the activities on track and helped establish a basis for mangrove conservation.

On the other hand, accumulation of and disbursement from the Environment Fund was not sufficiently on track by the end of the cooperation period, and did not contribute to the conservation of mangrove forest and resources.

Regarding the natural factors influencing the area of mangrove forest, some people suggest that soil salinity and soil erosion has a negative effect whereas others suggest increased rainfall has a positive effect. Hence, an Important Assumption is that natural

## PAGEMAS Molel: Self-supportive Management by Villagers as an Organization

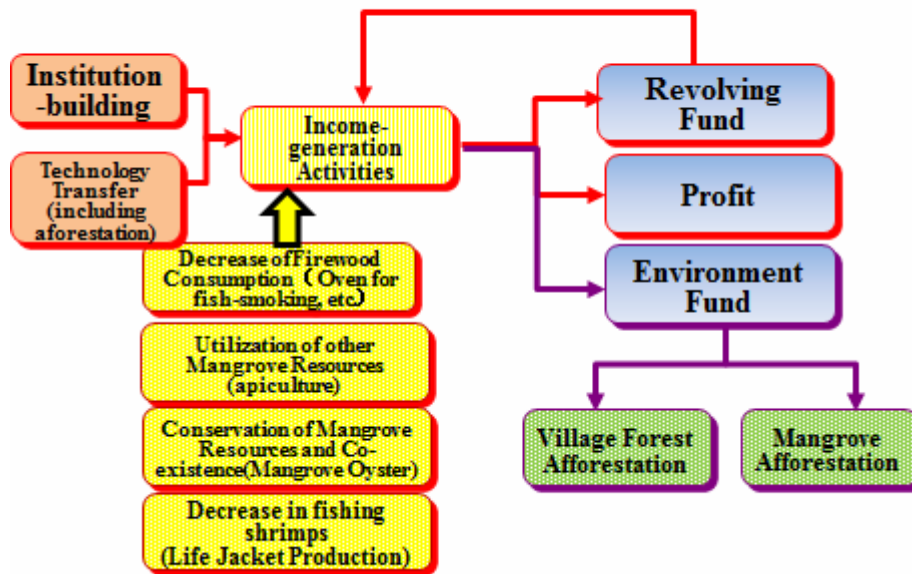


Chart 1 PAGEMAS Model

Source: by author based on the materials provided by JICA

Factors do not decisively influence the area of mangrove forest.

Based on the points mentioned above, I would like to consider the whole picture of the project again and analyze the reasons for not having achieved the project purpose. In the first place, the aim of this project can be understood to be the establishment of a model in which local people themselves conserve the mangrove forests self-supportively, in combination with 1) promoting income-generation activities useful for conserving mangrove resources and also useful for acquiring necessary skills, 2) establishment and management of an Environment Fund, for which parts of profits from income-generating activities are donated, and 3) afforestation utilizing the Environment Fund. At the end of the project, however, this model was not yet functioning. This can be attributed to the project's design which set a project duration which was too short. In a period of only 2 years and 4 months, so many objectives were set. It includes the sustainable management of an Environment Fund by the target villages which was meant to be achieved through awareness change of villagers and capacity building needed for organizational activities in the target villages where they did not have experience to conduct activities as a whole village as one unit before the project started.

Therefore, the Project Purpose is not verified as sufficiently achieved because the specific meaning intended was not clear enough, and appropriateness and measurability

of its Indicator were not sufficient.

### 3.2.2 Impact

#### 3.2.2.1 Achievement of Overall Goal

The Overall Goal (create the chance to know how to improve the living conditions of the population in the target area as the result of the sustainable management of mangrove forest) has not been achieved.

(1) Indicator 1 "State of mangrove forest resources at the surrounding villages (such as the area of mangrove forest, quantity of fish that are caught, etc.)": Not confirmed as the data did not exist to show the change in area of mangrove forest and amount of fish catch, etc.

There is no existing data on the mangrove forest area size and amount of fish caught in surrounding villages. During the implementation period, this project received visits from other target villages as well as surrounding villages, dispatching resident instructors, i.e., villagers who had already acquired the skill for income-generation activities, to surrounding villages, and inviting representatives from surrounding villages to the final workshop just before the project termination. The forestry technical officers also disseminated the results of the project and recommend that they learn from the surrounding target villages. Among the surrounding villages which were exposed to the information of the project, there was one village, Medina Sangako Village, which was able to increase area of afforestation, i.e., village forest. Medina Sangako village newly planted Eucalyptus because they had learned about the success the project had by planting village forest. However, they are not interested in establishment of Environment Fund. It is considered difficult to diffuse mangrove afforestation by establishment of Environment Fund, because neither increasing knowledge on the importance of mangrove forest nor institution building were provided to surrounding villages.

(2) Indicator 2 "Promotion of economic activities that contribute to the sustainable management of mangrove forest resources to surrounding villages.": Not considered as being achieved.

As for the income-generating activities, resident instructors visited surrounding villages as a part of the project activities for technology transfer of glove and boot making, receiving villagers from surrounding villages for afforestation skills, etc. However, these activities did not lead to sufficient acquisition of the target skills or their

utilization in surrounding villages.

On the other hand, five kinds of manuals developed by the project, i.e., oyster culture, shell culture and processing, improving oven for smoking fish, afforestation of *Avicennia* and afforestation of *Rhizophora*, are being used to help diffuse skills by the Wula Nafaa Project II (2008-2013) which is supported by USAID, and those skills are expected to be diffused in its project area<sup>5</sup>.

(3) Indicator 3 "State of extension to the surrounding of target villages for the sustainable management system of mangrove forest resources which is established in the targeted villages by the project.": Not extended.

At the time of ex-post evaluation, this indicator was not achieved. In other words, the model was not diffused to surrounding villages, i.e., afforestation based on the establishment of an Environment Fund linked with income-generation activities. Compared with the diffusion of income-generating activities, which has clear objectives that make it easy to motivate local populations in other areas, diffusion of the project's model requires an initial deep understanding of the importance of mangroves before further steps can be taken which include; the management capacity of an organization, financial management capabilities, consensus-making in the village, and establishing trust. Hence, where there is no such awareness change and capacity building already made, it is unrealistic to expect the model to be naturally diffused after termination of the project without any external support from either the government or donors. This project put emphasis on capacity development at the village level, and conducted activities intending that diffusion from village to village would occur during and after the project cooperation period. However, this way of technology transfer did not successfully diffuse the model. In order for the model to be diffused to surrounding villages, it would have been necessary to conduct activities, in parallel with income-generating activities, such as; establishing a sense of community, increasing knowledge and skills for institution building of the village organization to be the core of the activities, etc., and interference from outside the villages to promote those activities.

When diffusion of the project purpose was set as an Overall Goal, the project scope should have been broadened to minimize Important Assumptions, or risk factors, for achieving the Overall Goal based on an appropriate perspective based on sufficient analysis. If this was not possible due to realistic restrictions, long-term effect which can be expected in the target villages should have been set as the Overall Goal. The purpose

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<sup>5</sup>The target area of Wula Nafaa Project II consists of Tambacounda, Kedougou, Koulida and Ziguinchor, coastal zones and the delta region of the rivers in the Casamance and Sine-Saloum.

of Wula Nafaa Project mentioned before is to increase income of the population and does not include establishment of an Environment Fund.

For the above reasons, the Overall Goal has not been achieved at the time of ex-post evaluation, since the data for Indicator 1 is not confirmed, and the Indicator 2 and 3 have not been met.

### 3.2.2.2 Other Impacts

#### (1) Awareness and Behavioral change

In many target villages, a sense of community and solidarity as a village and significant attitudinal and behavioral changes such as taking actions before waiting for external support by the government or donors were observed. Also, some villages even expanded the function of Environment Fund and further utilize it for the community.

For example, in Mounde village, villagers initiated a new rule to provide a certain amount of oyster catch to the village organization and increased joint undertakings as a village organization, i.e., processing, seasoning, wrapping and sales. Financial management is properly made such that a person is put in charge of keeping books, and recording the quantity and sales amount of individual and joint undertaking respectively, while consensus-making and sharing information in the village meetings are regularly made. Moreover, the villagers have been taking positive actions such as going out of the village to search for new markets, asking for support for transportation cost to attend a Fair and packaging cost for expanding the sales amount. In this village, new tendencies (not seen before the project) can be observed such as collecting money for tax, repairing a mosque, electricity, and gas. Money is kept in the Fund for joint disbursement. They also consider new projects and tasks to undertake by themselves realizing that all the external support from donors will come to an end. This sort of tendency is a remarkable positive Impact brought about by the processes of institutional building and capacity development. This was made possible because the project's design allowed for institution building at the village level at all the target villages.

Including Moundé village, the project integrated institution building activities at the village level at all the target villages, and the capacity of the villagers was enhanced in numerous areas including; financial management; holding and facilitating meetings, discussing and setting strategic objectives, and understanding the importance of monitoring, etc. Awareness change and capacity building of the villagers were promoted by approaches to enhance the positivity of villagers such as self-evaluation workshops, presentation of activities at regional community<sup>6</sup> (hereinafter, CR) seminar,

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<sup>6</sup> regional community (CR) is under region, province and county in terms of local government structure, and

visit to other villages, etc. Also, the participatory approach (in which decision-making of future direction is made by the villagers themselves based on the discussions in the village meetings, etc.) contributed to the change<sup>7</sup>. This sort of project design can be considered the promoting factor for the remarkable behavioral change that took place. In addition, the follow-up dispatch of an ex-JICA experts who had established trust with the villagers lead to further capacity development and significant awareness change for institution building in addition to providing technical advice on afforestation by utilizing some Positive Approach management tools such as Action Learning and World Café.<sup>8</sup>

## (2) Policy Impact

The project is widely known not only in Foundiogne Province (where the target villages are located) but also in Fatick Region (which includes Foundiogne Province), and its positive effects such as its income-generation activities, the awareness change which has taken place at the village level, the strong initiatives taken by women, and the establishment and management of the Environment Fund have made a strong impression on people. Hence, the Regional Council of Fatick decided to commence a Community Management Program in November 2010 in order to promote the management of natural resources using a participatory approach<sup>9</sup>. This is a strong positive Impact from a policy perspective. This program aims at promoting forestry and marine resources including mangrove resources all over the region using a participatory approach with the budget from regional council and support from donors. It is remarkable that even before sufficient information was available and details were provided, the project influenced the new decision by the regional council.

As already stated above, even though this model did not diffuse naturally from village to village as it was initially expected, in terms of interference/external support for enhancing knowledge and awareness change, this model is regarded as highly effective. Although the Overall Goal has not been achieved, the remarkable positive impacts described above can be observed, and a policy impact has emerged as well. Negative impacts have not been observed.

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is responsible for supervising villages.

<sup>7</sup> Information from interviews with the target villagers

<sup>8</sup> Action Learning is a team approach method which simultaneously attempts to address both problem-solving and institution-building. It is known as “Question Meetings” in Japan, and is widely utilized in and out of Japan. World Café is a method for discussion in which participants have free conversations based on certain rules in a relaxed atmosphere to encourage creative ideas and wisdom. Both methods are defined as positive approaches (in a broad sense), in contrast to a gap approach, which tries to narrow the gap between the present problematic situation and the future desirable situation.

<sup>9</sup> According to the interview with Forestry Department of Fatick Region and Foundiogne Department.



As explained above, even though the Project Purpose (at the time of project termination) and the Overall Goal (at the time of ex-post evaluation) were not achieved (and the situation has not changed), significant positive impacts can be observed including: attitudinal and behavioral changes through institution building, and positive policy impacts. Therefore, the overall rating for Effectiveness and Impact is medium.

### 3.4 EFFICIENCY (Rating: ③)

#### 3.4.1 Input

Element of Inputs	Plan	Achievement (at the project termination)
(1)Dispatch of Expert	- Long-term 3 persons (R/D) < Breakdown> 1) Chief Advisor/Chief of the party (Forestry, Life resources management) 2) Deputy Chief Advisor (Liaison, Income-generation Activities) 3) Marine resources management/ Income-generation Activities	- Long-term 1 person - Short-term 4 persons ( Total 38.69 M/M) < Breakdown> 1) Chief Advisor/Chief of the party (Forestry, Life resources management) 3.8M/M 2) Deputy Chief Advisor (Income-generation Activities 1) 14.66M/M 3) Marine resources management (Oyster culture)/Income -generation Activities 2 9.4M/M 4) Income-generation Activities 3 ( Institution-building) 5.66 M/M 5) Interpreter 5.17 M/M
(2)Training in Japan	As necessary	3 persons
(3)Third-country Training	Not in particular	None

(4)Equipment Provision	Major Equipment: Equipment necessary for project implementation, spare parts, cars, etc.	Major Equipment: photo copy machine, PC, printer, fixed Separator, hanging scale, etc.
Total cost from Japan	N/A	Total: 251,950,000 Yen
Total input from recipient government	N/A	<u>Total: 192,500,000 FCFA</u>

#### 3.4.1.1 Element of Inputs

##### (1) Dispatch of Expert

As for the dispatch of experts at the planning stage, only three fields are shown in R/D, while its targeted figures were 39.37 M/M. Compared with this, five experts were actually dispatched for a total of 38.69 M/M, which is within the range of planned volume.

##### (2) Training in Japan

At the planning stage, training in Japan was described “as necessary,” and three counterparts were received as trainees. The theme of the training was “Policy concerning the Participatory Approach in Natural Resources Management, “and one counterpart was dispatched every year.

##### (3) Equipment Provision

Main equipment provided included: photocopy machine, PC, printer, fixed separator, hanging scale, etc.

The project concluded a sub-contract with a local consulting company in order to conduct activities in the 11 target villages which were scattered across a wide area and which included both inland areas and islands.

#### 3.4.1.2 Total Cost

The total cost from Japanese side was Yen 251,950,000. Although the amount planned at the initial stage is not clear, the total actual amount of the sub-contract, which shared 96.8% of the total cost, is 97.8%, and this amount is within the range of the contract amount.

#### 3.4.1.2 Cooperation Period

The cooperation period of the project was as scheduled: from November 2005 to

March 2008 (2 years and 4 months).

With all the information above, Efficiency is high because the inputs are appropriate for the outputs produced, while the total cost was within the planned range and the duration was as scheduled.

### **3.5 SUSTAINABILITY (Rating: ②)**

#### **3.5.1 Policy and Institution Aspects**

At the time of ex-post evaluation, the project was highly consistent with both central and local policy and institutional aspect with some exception.

There has been no change in PRSP II<sup>10</sup> and PFS which were consistent at the project planning stage. In “The Letter of Environment and Natural Resources Sector Policy” (2009-2015, hereinafter, LPSEN), which updated the LPSE, “securing rational management of environment and natural resources” was set as the objective for 6 years, and three strategic directions were shown as follow; 1) increase in basic knowledge on environment and natural resources, 2) strengthening the fight against degradation of environment and natural resources, and 3) enhancement of organizational and technical capacity of those who are concerned with the environment and natural resources. Among these, item 2 above shows prevention of degradation of forestry resources.

At regional level, Regional Council of Fatick decided to promote the Community Management Program from November 2010 as already explained. This program is not a project with a time limitation but implemented without limited duration with budget from the regional council as a part of its policy, which shows a high degree of consistency with local policy.

On the other hand, in the marine field, Senegalese government subsidies to Chinese life jacket manufacturers has been hampering the income-generating activities related to life jacket production and sluggish sales has led to a stop in production. Two of the target villages, therefore, have too much stock and cannot continue production. Among the two, Mbam village tried several times to apply for a subsidy but had not been granted a subsidy as of the time of ex-post evaluation, and the possibility for continuing production in the future is not clear. The failure of realizing the recommendation given at the final evaluation to “set up a comprehensive coordinating committee involving Fishery Department” has been negatively affecting Sustainability.

#### **3.5.2 System of Counterpart Organization**

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<sup>10</sup>PRSP II was originally effective until 2010, but it seems to be still valid at the time of ex-post evaluation because the next version is still at the planning stage.

Since the project put most emphasis on institution building and capacity development at the village level, involvement of the DEF/CCS, i.e., Forestry Department at Dakar, and its branch offices including the Forestry Department at Fatick Region, at Foundiougne Department, etc. during implementation period was insufficient. However, branch offices of the Forestry Department will cooperate on the implementation of the Community Management Program as explained before, and it is probable that a support system will be improved at the regional, departmental and district level if the program is steadily implemented.

At a district level, the Forestry Technical Officers support to the target villages are meeting their needs, since they have been providing small equipment such as pots for planting and giving appropriate advice even after the project termination, although the frequency of visits decreased to the same level as other villages<sup>11</sup>. The major reason that the decrease in the frequency of visits to the target villages has not had a negative effect on afforestation in the target villages is due to a sufficient improvement in the villagers' afforestation skills. In some of the villages where awareness change as a result of project activities could be observed, villagers, now, not only wait for the visits of the Technical Officers but representatives of the village make visits to the Technical Officers when necessary on their own initiative, to ask for advice and to receive provision of small equipment such as pots needed for afforestation<sup>12</sup>. Some Forestry Technical Officers have been trying to coordinate and resolve problems in fields outside the forestry field, such as oyster culture, etc., and disseminating information on the experience and results of the project to surrounding villages.

On the other hand, Technical Officers under the Fishery Department, Ministry of Marine, Economy, Fishery and Aquiculture, have rarely visited. Since the ministry or department in Dakar did not inform its local branch offices regarding the project in the beginning, some Fishery Technical Officers were not even aware of its existence. A Fishery Officer who cooperated with the project during implementation period, gave support not because he was instructed to by the upper organization but only in reaction to requests from parties concerned with the project. Therefore the possibility of future involvement by Fishery Technical Officers is very low. However, no significant influence is observed since their involvement was minimal during implementation stage, and the villagers have been conducting activities to increase income by themselves (without the help of Fishery Technical Officers). The problem is that the lack of the Fishery Department's involvement comes not from the local level but from the central departmental level and this is now negatively affecting income-generating activities

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<sup>11</sup> According to the interview with the target villagers

<sup>12</sup> According to the interview with the villagers at Mbam

related to life jacket production and sales.

### 3.5.3 Skills of Counterpart

There should be no problem regarding the capacity of the Forestry Technical Officers to teach and advise on afforestation at the sites, as it is recognized as sufficient by both the Forestry Department and the local population. Technology transfer (except in regards to afforestation) was not the task of the Forestry Technical Officers but of the local apiculture unions and the Japanese expert (fishery). Although the role of the Forestry Officers were limited to technical support mainly in afforestation and general monitoring, advice and coordination, there is no specific problems in the target villages on this point either, as the acquisition of skills for income-generation activities were almost completed by the end of project cooperation period.

In the meantime, the project put priority on improving villagers' skills and intended that the model would diffuse to surrounding villages by way of the villagers in the target villages. As the role of Forestry Officers is limited (as mentioned above), there is no problem in technical support for afforestation, but it is supposed to be difficult for the Forestry Officers to provide technical guidance in regards to the fishery field, and to be facilitators in institution building activities helping to arouse the attitudinal and behavioral changes essential for diffusing the model. The skills at villagers level is shown in 3.5.5 below.

### 3.5.4 Finance of Counterpart

As for the prospects of obtaining ongoing budget for sustainable management of mangrove forest in the target area: clear answers were not given by the Forestry Department in Dakar. On the other hand, the Forestry Departments at Fatick Region and Foundiogne were hopeful, pointing out that budget from Fatick Regional Council and from donors for Community Management Program will be given. However, details of the programs' content and budget were not clear enough and sufficient information was not available on the involvement of the organization concerned and its long-term framework. Although the district office of the Forestry Department has not received sufficient information, the Community Management Program, which was commenced in November 2010, has already started by appointing a contact person at each CR from June 2011. However, the regional council's budget is said to be rather abundant, which is a positive factor to help diffuse the model in the future since this sort of budget could be utilized for extension in the whole Region.

While the continuation of the project effect at the target villages will be described in 3.5.5, financial uncertainty of the administration is not a significant hindrance to the

continuance of project activities, because the project put priority on developing the capacity of villagers and village organization, and the villagers had acquired basic skills by the end of the project.

### 3.5.5 Continuance of Effects

#### (1) Income-generation Activities

##### 1) Skills of the Villagers

The level of skills acquired by the villagers is generally high, and they have been conducting activities with sufficient level of skills maintained. Skills needed in regards to apiculture and fish cage were regarded to be insufficient at the time of Final Evaluation. However, at the time of the Ex-post Evaluation, the apiculture skill of the villagers were sufficiently acquired, and properly utilized. The reasons contributing to skills being sustained include: conducting a survey and trial (pilot project) during the development study (mentioned above), and providing proper technical guidance during implementation period. Also, the reason those skills have been utilized after the project's termination is that the villagers are now able to conduct activities systematically as an organization (in contrast with the situation before the project) as a result of the institution building activities conducted at all of the target villages during the project implementation period. As for the fish cage, however, it was left without being utilized for reasons to be explained later.

With regard to the maintenance of the skills acquired, there should be no problem. Also, as explained before, five target villages (Sangako, Mounde, Siwo, Djirnda, Bassoul) are included in the target area of Wula Nafaa Project II (2008-2013) which is supported by USAID, while there is possibility that two more target villages, i.e., Ndjambang, Dassilamé Serère, will be included. In these villages, maintenance of the skills acquired



(Fish-smoking activity utilizing improved Oven)



(Product of Shell Processing/Cooking)

can be expected as training will be provided utilizing the manual developed by the project.

## 2) Revenue from Income-generating Activities

The revenue from the income-generating activities at the time of the ex-post evaluation is shown in Table 2. The total accumulated revenue was 311,681,000 FCFA and profits were 67,372,844 FCFA.

As for village-wise revenue, both Siwo village and Moundé village were remarkable, showing a sharp increase after November 2011. The sales amount from smoking fish in Siwo and processing/cooking shellfish in Moundé significantly increased. The common points observed in both villages are as follows;

- Institution building by the project which aroused a sense of community and solidarity was successful and the working committees are functioning sufficiently under their leader.
- There is a person in charge who can keep appropriate records of the Environment Fund such as sales and finance.
- There is trust among the villagers in regards to the fund's financial management.
- The villagers are keen to ensure sustainability.
- They have attitude and capacity to consider the village's future development under their own initiative, combining support from donors as needed (e.g., both villages receive support from Wula Nafaa Project for transportation cost incurred in order to join a fair).

In addition to the above points, in Siwo village, villagers tend to utilize the skills acquired and to further develop those skills by themselves, while in Moundé, villagers have enacted a rule (under their own initiative) to donate a certain amount of income generated individually in order to undertake activities which would make individual and community activities more compatible.

On the other hand, the future prospects are unclear for those villages that have only one stagnant income-generating activity. In Kamatane Bambara village and Mbam village which have only one income-generating activity (i.e., life jacket production and sales), although people acquired a high level of skill during the project implementation period and succeeded in producing high level products, production stopped after sales dropped due to the government subsidies that were granted to Chinese life jackets. Especially in Kamatane, successful institution building and remarkable awareness change can be observed, and Mbam tried several times to apply for the governmental subsidy, but

Table 2 Sales Amount from Income-generation Activities per village

(Unit : FCFA)

	Name of Target Villages	Sales Amount			
		A. During Project Period	B. Aftr termination until dispatch of F/U Expert	C. After dispatch of F/U Expert until Ex-post Evaluation	Total
		(NOV 2005-MAR 2008)	(APR 2008 - mid-NOV 2009)	(late NOV 2009 - FEB 2011)	(NOV 2005- FEB 2011)
1	Siwo	127,000	0	250,951,050	251,078,050
2	Moundé	238,500	623,100	53,986,250	54,847,850
3	Bassoul	371,000	258,000	2,358,000	2,987,000
4	Djirnda	0	153,000	1,035,000	1,188,000
5	Mbam	448,000	0	10,000	458,000
6	Kamatane Mbambara	210,000	200,000	9,000	419,000
7	Ndjambang	14,500	297,000	0	311,500
8	Dassilamé Serère	189,000	0	45,000	234,000
9	Bangalère	33,400	100,700	7,500	141,600
10	Gagué Cherif	16,000	0	0	16,000
11	Sangako	0	N/A	N/A	0
Total		1,647,400	1,631,800	308,401,800	311,681,000

[Source] A and B: from materials provided by JICA, C: from interviews at the target villages

[Remarks]

1.As for C. of Bassoul, products of fish-smoking was still on market at the time of Ex-post Evaluation, and there will be no deficit if all the products are sold out as it used to be (Expected Sales amount: 3,045,600 CFA, Expected Profit: 38,860 CFA).

2.The unclear or figures unknown or unclear due to lack of record is not included in the above figures. For example, oyster culture and shell-cooking is not included in the figures, because specific figures were not available for C. period as the record was missing.

the situation has not improved. In Gagué Cherif, where the recommendation at the final evaluation to give technical support of fish cage activities, the cage has not been utilized primarily due to the lack of motivation on the part of the villages who understand that the cage can most likely not be able to catch sufficient amount of fish because it is too heavy for them to put it sufficiently far from the shore. In these villages, no promising alternatives have been found to generate income which is a negative factor in terms of sustainability.

In terms of each activity, shell-processing and fish-smoking (improved oven) are generally going well but mangrove oyster culture and eco-tourism are not (Table 4). In some villages, villagers lost their motivation in the case of mangrove oyster production, profits are considered unattractive because the volume decreases when cooked. Although these villages hope to sell fresh oysters, they do not have the necessary skills and equipment. There are some other villages that, with the support of JOCV, have succeeded in selling fresh oysters. In Dakar, for example, villagers are able to utilize a fish pond owned by the Senegalese government. Although other villages would like to



Table 3 Profit from Income-generation Activities per village

(Unit : FCFA)

	Name of Target Villages	Profit Amount			
		A. During Project Period	B. Aftr termination until dispatch of F/U Expert	C. After dispatch of F/U Expert until Ex-post Evaluation	Total
		(NOV 2005-MAR 2008)	(APR 2008 - mid-NOV 2009)	(late NOV 2009 - FEB 2011)	(NOV 2005- FEB 2011)
1	Siwo	49,350	0	65,750,449	65,799,799
2	Djirnda	156,000	220,000	242,000	618,000
3	Dassilamé Serère	72,720	0	193,250	265,970
4	Moundé	114,795	78,600	46,000	239,395
5	Sangako	0	165,000	47,000	212,000
6	Mbam	105,000	0	5,000	110,000
7	Bangalère	17,440	48,000	7,500	72,940
8	Kamatane Mbambara	67,650	0	0	67,650
9	Ndjambang	13,330	0	0	13,330
10	Gagué Cherif	6,000	0	0	6,000
11	Bassoul	8,500	108,000	-148,740	-32,240
Total		610,785	619,600	66,142,459	67,372,844

[Source] A and B: from materials provided by JICA, C: from interviews at the target villages

[Remarks]

1.As for C. of Bassoul, products of fish-smoking was still on market at the time of Ex-post Evaluation, and there will be no deficit if all the products are sold out as it used to be (Expected Sales amount: 3,045,600 CFA, Expected Profit: 38,860 CFA).

2.The unclear or figures unknwn or unclear due to lack of record is not included in the above figures. For example, oyster culture and shell-cooking is not included in the figures, because specific figures were not available for C. period as the record was missing.

use this same pond, space is limited and the villages presently using the pond are highly unlikely to allow the participation of new villages. Almost all Eco-tourist activities have been suspended because many of the trained eco-guides are no longer available for reasons which include: moving out of the village, getting married, and withdrawing from the village organization to become independent.

As for future revenue prospects, any drastic expansion of production will be difficult unless a new market in a medium-sized city can be found. Many of the products that are being sold in the surrounding villages can be maintained near current levels in line with expectations based on the current activities/villages which are already on track. In contrast with the high level of acquired skills, market access and sales marketing capacity are low, which hinders any further increase of income. Since Wula Nafaa Project includes training activities on marketing, there is a possibility that marketing capacity will be improved in the target villages of PAGEMAS which are now included in Wula Nafaa Project as a complementary

effect<sup>13</sup>.

Table 4 Revenue from Income-generation Activities per activity in the target villages  
(Total amount from project commencement to ex-post evaluation)

(Unit: FCFA)

	Income-generation Activity	Sales Amount	Profit	Name of Village	Breakdown of Sales Amount	Breakdown of Profit Amount
1	Protection of Small Shells/Improvement of Shell Processing	54,951,750	589,110	Bangalère	77,100	17,440
				Moundé	54,357,350	132,100
				Siwo	517,300	439,570
3	Mangrove Oyster Culture	0	212,000	Ndjambang	0	0
				Sangako	0	212,000
4	Life Jacket Production and Sales	877,000	177,650	Kamatane Mbambara	419,000	67,650
				Mbam	458,000	110,000
5	Apiculture	962,500	236,830	Bangalère	64,500	55,500
				Djimda	333,000	122,000
				Moundé	253,500	46,000
				Ndjambang	311,500	13,330
6	Fish-smoking (Improved Oven)	254,402,750	65,823,989	Siwo	250,560,750	65,360,229
				Bassoul	2,987,000	-32,240
				Djimda	855,000	496,000
7	Diversification of fishing activities (Fish Cage)	16,000	6,000	Cagué Cherif	16,000	6,000
8	Eco-Tourism	471,000	327,265	Dassilamé Serère	234,000	265,970
				Moundé	237,000	61,295
	Total	311,681,000	67,372,844		311,681,000	67,372,844
[Source] compiled by the author with the materials provided by JICA and interviews with villagers						
[Remarks] Fish-smoking at Siwo was not included in the initial plan.						

## (2) Environment Fund

The amount of accumulation and disbursement in each village from the project's termination till the ex-post evaluation is shown in Table 5. Although it differs depending on the village, the amount is generally increasing, and many villages show a constant increase. On the other hand, in some villages, revenue from income-generating activities has stagnated, or a large amount of revenue has not lead to a corresponding accumulation in the Environment Fund. In some of the target villages, some uncertainties in regards to the future prospects of the Environment Funds can be observed, because the Funds prospects are closely linked to an increase in revenue from income-generating activities, management capacity of village organizations, and establishment of solidarity and trust among villagers.

<sup>13</sup> Wula Nafaa Project includes 5 of the PAGEMAS target villages (Sangako, Moundé, Siwo, Djirunda, Bassoul). It has possibility of including two more target villages (Ndjambang, Dassilamé Serère) in the future.

Table 5 Accumulation and Disbursement of Environment Fund  
(Total amount since project commencement till ex-post evaluation)

(Unit : FCFA)

The Amount Accumulated and Disbursed for Environment Fund									
	Name of Target Villages	Accumulated Amount				Disbursed Amount			
		A. During Project Period	B. Aftr termination until dispatch of F/U Expert	C. After dispatch of F/U Expert until Ex-post Evaluati on	Total	A. During Project Period	B. Aftr termination until dispatch of F/U Expert	C. After dispatch of F/U Expert until Ex-post Evaluati on	Total
		(NOV 2005- MAR 2008)	(APR 2008 - mid- NOV 2009)	(late NOV 2009 - FEB 2011)	(NOV 2005- FEB 2011)	(NOV 2005- MAR 2008)	(APR 2008 - mid- NOV 2009)	(late NOV 2009 - FEB 2011)	(NOV 2005- FEB 2011)
1	Bangalère	6,435	13,800	0	20,235	0	13,800	0	13,800
2	Bassoul	0	0	38,800	38,800	0	0	0	0
3	Dassilamé Serère	18,180	41,000	199,750	258,930	0	0	133,000	133,000
4	Djirnda	25,000	115,000	90,000	230,000	5,000	115,000	0	120,000
5	Gagué Cherif	1,500	0	0	1,500	0	0	0	0
6	Kamatane Mbambara	16,912	84,275	134,825	236,012	0	800	26,675	27,475
7	Mbam	26,250	65,000	0	91,250	0	0	29,500	29,500
8	Moundé	14,545	5,000	451,166	470,711	25,000	5,000	0	30,000
9	Ndjambang	3,332	83,000	60,000	146,332	0	3,000	60,000	63,000
10	Sangako	0	10,500	34,000	44,500	0	1,500	0	1,500
11	Siwo	12,335	42,300	0	54,635	0	3,800	334,000	337,800
	合計	124,489	459,875	1,008,541	1,592,905	30,000	142,900	583,175	756,075
[Source] A and B: from materials provided by JICA, C: from interviews at the target villages									
[Remarks]									
1. The figures include direct disbursement from profits before accumulating the amount in the Environment Fund.									
2. The figures include the amount kept by Village Chief before deposit to the bank.									

### (3) Afforestation

Although the target level of the Project Purpose is not clarified as already explained, if we apply the estimation shown in the preceding development study to a larger target area, the target figure of afforestation by the end of the project duration is 2.79 ha, and 6.4 ha by 3 years after termination. The area of mangrove afforestation has been increasing even after the project's termination<sup>14</sup>. Although there is no quantitative data available,

<sup>14</sup> Although the amount of all the target villages totals to 754%, which significantly exceeds the target level for 3 years after termination, only Ndjambang village shows an extraordinary amount, and the reasons for the remarkable differentiation from other villages in this survey- could not be clarified. On the other hand, even if excluding the amount of Ndjambang (0.76ha), the target at the time of ex-post evaluation (6.4ha)

many villagers in the target villages claim to have seen an increase in the number of small fish under mangrove trees<sup>15</sup>.

Table 6 Area of Mangrove Afforestation in the Target Villages

					(Unit : ha)
		A. During Project Period	B. Aftr termination until dispatch of F/U Expert	C. After dispatch of F/U Expert until Ex-post Evaluation	Total
		(NOV 2005-MAR 2008)	(APR 2008 - mid-NOV 2009)	(late NOV 2009 - FEB 2011)	(NOV 2005- FEB 2011)
1	Bangalère	0.35	0.01	0.00	0.36
2	Bassoul	0.00	0.00	2.00	2.00
3	Dassilamé Serère	0.00	0.00	0.83	0.83
4	Djirnda	0.06	0.09	0.00	0.15
5	Gagué Cherif	0.48	0.00	0.00	0.48
6	Kamatane Mbambara	0.00	0.00	0.00	0.00
7	Mbam	0.00	0.00	0.00	0.00
8	Moundé	0.00	0.00	0.00	0.00
9	Ndjambang	0.38	0.25	44.00	44.63
10	Sangako	0.41	0.20	2.00	2.61
11	Siwo	0.00	0.00	0.00	0.00
Total		1.68	0.55	46.00	51.06
[Source] A and B: from materials provided by JICA, C: from interviews at the target villages					
[Remarks]					
1. In case area of forest was not available but the number of seeds or trees were available in the interview result, the figures were converted into area of forest based on the planting interval promoted by this project, i.e., 50cmx50cm, which makes 40,000 seeds or trees 1ha.					
2. In Bassoul and Dassilamé Serère, 2.0ha and 0.83ha of Reizophora were planted respectively from late November 2009 till February. These are included in the above figures, although Reizophora was not included in the initial afforestation plan of the project.					
3. Although mangrove afforestation was not included in the initial project plan in Bassoul, Dassilamé Serère, Kamatane Mbambar, Mbam, Moundé, Siwo, these figures are included in the above, as the figures explained in 2. above are included					

Factors which may have contributed to the above situation include; the villagers had acquired sufficient level of skills by the time of project termination, and some NGOs gave support to the villages for bearing the cost of afforestation, which produced complementary effect.

Sometimes mangrove afforestation was made even where or when the accumulation of the Environment Fund was not sufficient, as they had support from donors including local NGOs for receiving seeds and/or boat rentals for obtaining seeds from mangrove trees. Some villages planted mangroves without using the Environment Fund even though funds had accumulated, as they had support from NGOs. In the meantime, in

based on the figure estimated at the development study was achieved.

<sup>15</sup>According to the interviews with the target villagers

considering the project's sustainability, establishment of the Environment Fund is very important because it is essential for awareness change of the villagers to conserve mangrove resources under their own initiatives at the village level, without depending on too much external support.

One of the reasons the ongoing management of income-generating activities as well as for the Environment Fund and afforestation is that the village organizations at the target villages which undertook project sponsored institution building have continued to play a major role in conducting all those activities. Although the level differs depending on each village, planning as an organization, monitoring, sharing the monitoring results at village meetings, recording and management of income-generating activities as well as afforestation activities and decision-making based on these records are conducted with the participation of villagers, with the initiatives of committees. These facts show that the organizational management capacity of the target villages are higher than most of the other villages in the area, (with few exceptions). The project activities for institution-building at all the target villages during implementation period led to the continuance of the organizational management at the village level. In addition, the follow-up dispatch of an ex-Japanese expert of the project after project termination for the sake of sustaining and further enhancing project effects, most likely was another promoting factor<sup>16</sup>. Dispatching an ex-expert who had already established trust with the villagers during implementation stage ensured consistency. Hence, institution-building was maintained and further promoted, especially because he effectively utilized Positive Approach management tools such as Action Learning, etc. Through the project, some new leaders have emerged, who are expected to play a major role together with the village organization to maintain and develop activities including the Environment Fund and afforestation. Also, if the Community Management Program (started in Fatick Region) functions, the maintenance and strengthening of organizations not only in the target villages but also in the whole area can be expected. On the other hand, however, transparent financial management, sharing monitoring results at village meetings and trust through consensus-making have not been established in some of the villages where the progress of income-generating activities, accumulation and disbursement of Environment Fund, etc. are falling behind.

#### (4) Perspective on Achieving Overall Goal

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<sup>16</sup>The ex-Japanese expert was dispatched twice between September 2008 and November 2008. The task included follow-up for another project, support for the basic principle of cooperation in the Environment Sector for Senegal and project formulation to support Forestry Department.

With regard to the diffusion to surrounding villages, it is hard to expect that the income-generating activities, Environment Fund and mangrove afforestation to be naturally extended. As for the diffusion to surrounding village mentioned in the Overall Goal, if Wula Nafaa Project and Community Management Program function well, it is expected to be diffused in the target areas of those project/program. Also, diffusion of the model including Environment Fund might be difficult to be diffused in wide area (as intensive external support to organizations for core village organizations is necessary), but there is a possibility for diffusion depending on the progress of the Community Management Program, as afforestation utilizing the Environment Fund with a participatory approach is included.

The aim of his project was supposed to be the establishment of a "PAGEMAS Model," i.e., a system in which the cost for the conservation of mangrove forest resources and afforestation is covered by the establishment and management of an Environment Fund. Part of the profits gained by income-generating activities are donated to the fund, which also contributes to conservation of mangrove forest as well, by institution-building of village organizations, improving skills needed for income-generating activities and systematic implementation of income-generating activities at the village level, as well as sustainable management of mangrove resources by the villagers own initiative.

Based on this understanding, Sustainability of the project is judged as ② for the following reasons. In the target area of the project, a) the effects observed at the time of final evaluation were still sustain, b) in terms of organizational management system, many of the village organizations have sufficient skills as well as high competency as an organization, although the extent differs depending on the village, c) from the aspects of policy and institution, no problems are observed in forestry sector, while some problems are seen in fishery sector, d) although the level of skill at the village level required for sustaining effects is high, there is a problem in expanding new markets which is a crucial factor for a sound financial basis in the future, leaving some concerns in regards to the possibility of conserving mangrove resources in the future.

For all the reasons above, the Sustainability of the project effects is medium. Although the sustainability of activities in the target villages is high, there are some policy and financial problems which hamper the diffusion of activities to surrounding villages.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

The Relevance of the project is high, as it is consistent with the Senegalese development policy and development needs as well as Japanese aid policy. Also, the Efficiency is high as the elements of the Inputs are appropriate, and no problem can be seen in terms of duration and cost. On the other hand, as for the Effectiveness, the Project Purpose cannot be determined to have been achieved since the Project Purpose lacked clarity and measurability. Regarding the project's Impact, although the Overall Goal has not been achieved, a significant positive impact is observed in; the emergence of community spirit in each village, an improvement in organizational management skills at the village level, and a remarkable change in awareness in many target villages compared with the situation before the project implementation, (i.e., self-motivation and positivity, etc.). Hence, the Effectiveness and Impact from a comprehensive perspective is judged as medium. The Sustainability is also judged as medium, because; although the sustainability of effects in the target villages is high, the diffusability to surrounding villages is not sufficient from a political, institutional, organizational, and financial perspective. For the above reasons, the evaluation result of this project is high.

## **4.2 Recommendations**

### **4.2.1 Recommendations to Counterpart Organization**

The Forestry Departments at Dakar and at Foundiogne should regularly monitor the progress on the Community Management Program and the improvement in market access for the income-generating activities (apiculture, mangrove oyster culture, etc.). Also the Department should share the monitoring results with the above program committee and other donors, and make coordination among the stakeholders if necessary.

### **4.2.2 Recommendations to JICA**

The JICA Senegal Office should carefully watch the progress of the Community Management Program, share the monitoring results from; the Forestry Departments at Dakar and at Foundiogne; and information provided from time to time by the other donors such as USAID; and advise all concerned organizations such as the Forestry Department at Dakar, etc. as necessary.

## **4.3 Lessons Learned**

### **(1) Setting of project duration**

When you plan a project in which awareness change in terms of creating a new sense of solidarity as a community is vital for achieving the project objective, it is essential to have a sufficient survey on the social and cultural background, and to secure a sufficient project cooperation duration at the planning stage, as it takes more time until awareness

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Reason: One of the major reasons why the Project Purpose was not achieved by the end of the project cooperation period is that it tried to accomplish too many objectives within the allotted 2 and 4 years. In addition to technology transfer for income-generation, other objectives included; the establishment of an Environment Fund, management by the whole village as one organization, accumulation of donations (part of the profit from the income-generating activities) and continuously planting mangrove and substitute trees. Achieving such objectives requires much time in an area where, prior to the project, people have had only a very small sense of unity as a community as they generally live separately in smaller groups within a village and have had only minimal experience to take joint action as a whole village. We have to keep in mind that it will lead to failure of achieving the Project Purpose and thus lower the Effectiveness at evaluation unless a careful analysis is done at the planning stage in regards to whether or not a change in awareness is necessary to bring about significant behavioral change for success of the project, and whether or not the project duration is sufficient for causing the change.

## (2) Setting of Project Purpose and Overall Goal

It is indispensable to set a clear and logical Project Purpose as well as specific and measurable Indicators to judge a project's Effectiveness. Checking the accessibility of data required for Indicators is necessary at the planning stage. If appropriate data is not available or too difficult to obtain at the time of planning, alternative Indicators must be considered or activities for collecting data should be added to the project's scope.

At the same time, in relation to a project's Impact, when including "diffusion" of a project's effect to other areas into a Project Purpose as an Overall Goal, we should avoid making easy hypothesis and conduct sufficient analysis to minimize Important Assumptions, or uncontrollable risk factors, and increase the probability of achieving the Overall Goal by adding necessary project components or linking the project to other projects which have complementary effect. If circumstances do not permit, the long-term effect should be set such that it can be achieved within the target area.

Reason: Another reason why the project cannot be judged as having achieved the Project Purpose by the end of project duration is that the Project Purpose had a problem in its clarity and logic, with inappropriate and inaccessible Indicators. Also, the reason that the Overall Goal had not been achieved at the time of ex-post evaluation is that there was an ungrounded supposition that the project effects would be diffused from villagers in target villages to villagers in surrounding villages once the project period was over; however, this would have required a degree of behavioral change in villagers which in turn would have required both institution-building and awareness change. In a project



like this, in order for the model established by the project to be diffused outside the target area, those areas outside the target area must undergo significant attitudinal and behavioral changes. Such changes require intensive support including external resources such as personnel with appropriate knowledge and skills in crucial areas such as institution-building. Neither the model nor the project effect can be diffused from villagers to villagers relying solely on their efforts. Therefore, sufficient analysis on the conditions necessary to be met not only from a technical perspective but also from a social, cultural and financial perspective must be undertaken and the results of such analysis must be reflected into a modified project design. If necessary, the project should be designed not as an independent project but as a part of a program, i.e., a group of projects with a common objective. People concerned should be fully aware that it is quite likely that the project will fail to achieve its Overall Goal, unless these actions are taken properly before project commencement. Also, it should be noted that achievement of Overall Goal is one of the most significant checkpoints of assessing Impacts at ex-post evaluation.

### (3) Securing collaboration with relevant ministry/agency

Since cooperation in the field of conservation and management of mangrove resources are concerned with a wide range of resources, it is indispensable not only to have official cooperation with the government body in charge of forestry but also with the ones in charge of fishery, so that orders or instructions are made consistently from the central government to the local level. Even if it does not appear to be significant at the planning stage, it can cause negative effects, having a a negative influence on administrative or policy aspects latter in the project such as the latter half of the implementation period or even after termination.

Reason: One of the negative factors concerning the Sustainability of the project involves some activities concerned with the fishery department involving life jacket production. Although villagers acquired the necessary skills to produce high quality products, life jackets sales are stagnant due to government subsidies to Chinese life jacket producers which have reduced the villagers' advantage in terms of market price. Also, Fishery Technical Officers' involvement throughout the implementation period and afterwards has rarely been observed. This lack of involvement is largely due to the fact that the central level of Fishery Department failed to instruct the local level Department and Fishery Technical Officers to cooperate and the local technical officers do not know that their organization is identified as the collaborative organization of this project. In a project concerning the improvement of a mangrove forest, it is necessary to have a commitment from the department or governmental organizations concerned with fisheries as an official

collaborative partner. Particularly in the field of mangrove forest conservation and management, the Forestry Department would find it very difficult to cover the whole scope of the project on its own and instruction for cooperation with the Fishery Department from the central level to local level prior to start of project cooperation should be obtained.