

## **CHAPTER 8 REFLECTION OF RESULTS OF VERIFICATION STUDY IN MASTER PLAN**

### **8.1 Content of Verification Study**

In this study, some of the projects composing the Master Plan were implemented as model projects and a verification study was carried out in 12 villages in 3 districts representing the study area in order to feed the results of evaluation of the appropriateness and feasibility of the projects back to the Master Plan.

In the verification study, it was necessary to organize the residents, implement model projects (hereinafter called “verification projects”) on the initiative of the residents and conduct monitoring and evaluation of the projects within the limited period about 3 years. For this purpose, a total of 6 local coordinators (one man and one woman in each district) were posted in the 3 verification districts to build a relationship of trust between the Study Team and the residents, maintain close contact with the residents and conduct activities to enlighten residents on the necessity of Terroir Management. The local coordinators lived in the villages in the district under their charge, and offered advice and guidance to residents on implementation of the verification projects, and monitored the projects and collected data, while also maintaining links with related agencies in the government of Mali.

Residents’ contributions to the verification projects were as follows:

- ① For items that directly contribute to the income of each UPA (farming household), residents bear 70% of the cost when the technology is established in the district, and 20% of the cost when the technology is not established.
- ② Contributions for equipment and materials in common use are 20% of the cost.

Most of the verification projects are implemented independently by village residents’ organizations set up with the support of the Study Team and are ongoing as of February 2003. Some of the villages are expanding the projects by adding residents’ own ideas or are influencing other surrounding villages. Views obtained on implementation of the verification projects and the items to be reflected in the Master Plan are arranged by program and shown in Table 8.1.1.

**Table 8.1.1 Items of Verification Study to Be Reflected in the M/P**

Objective	Verification Project	Items To Be Reflected in M/P
(1) Improvement of residents' ability to run projects	<Terroir Management Support>  Posting of local coordinators (lodging and motorcycles)	<ul style="list-style-type: none"> <li>From the viewpoint of maintenance and use, the motorcycles that extension workers use for village tours to support residents are 80cc on-road motorcycles.</li> <li>A system enabling the user to eventually buy the motorcycle in monthly installments is adopted. By this method, the users (extension workers) are responsible for maintaining their own motorcycles.</li> </ul>
	<Support for organising of residents> Execution of Participatory Rural Appraisal (PRA) survey	<ul style="list-style-type: none"> <li>The gathering of villagers, and storage and use of products require prior consent by the village side.</li> <li>Implementation of the PRA survey is avoided in the farmers' busy season.</li> </ul>
	Formulation of land use plan (SAT) and development project plan (PAT) and monitoring by farmers	<ul style="list-style-type: none"> <li>SAT, PAT and agreements with project implementers are prepared in Bambara and distributed to the UPA heads for distribution and publicization.</li> <li>Agreements with project implementers stipulate that each CGTV shall periodically monitor and assess the progress of the plan, particularly the payment of contributions and their deposit in the cashbox.</li> </ul>
	Visits to advanced areas	<ul style="list-style-type: none"> <li>Participants are required to evaluate the items under inspection and report the results of the inspection to their villages.</li> </ul>
	Literacy classroom (community centre) construction project	<ul style="list-style-type: none"> <li>Residents contribute 300,000 FCFA in addition to providing labor at no cost.</li> </ul>
	Training of literacy teachers	<ul style="list-style-type: none"> <li>An instructor is dispatched to each village to conduct literacy training. The period spent in each village is approximately 90 days.</li> <li>The salary of the village literacy teachers appointed from among the participants in the training is agreed in advance by the participants and CGTV.</li> </ul>
	Literacy training in villages	<ul style="list-style-type: none"> <li>The village literacy teachers are those participants who reached literacy level II as specified by the Ministry of Education.</li> <li>The employment conditions of the teacher and the contribution of participants are agreed in advance by the CGTV, teacher and participants.</li> <li>Each participant in the training is required to contribute a part of the cost, participate in the evaluation tests before and after the training, attend the training and acquire the prior consent of his family.</li> </ul>
	Training of accountants and leaders	<ul style="list-style-type: none"> <li>Participants in the training must have reached literacy level II or higher as specified by the Ministry of Education.</li> </ul>
	Support for establishment of micro credit system	<ul style="list-style-type: none"> <li>Residents are required to regularly report the operational status (amount loaned, number of loans, number of members and amount deposited) to the general meeting of residents.</li> <li>Instructions are given that all residents' contributions are put in the cashbox as fixed deposits and the costs necessary for maintenance and operation of the facilities and for activities accruing no revenue are collected separately by the CGTV until the fixed deposits generate interest.</li> </ul>
(2) BHN fulfillment	Road construction project	<ul style="list-style-type: none"> <li>Extension workers provide full guidance for road maintenance and management after construction.</li> </ul>

Objective	Verification Project	Items To Be Reflected in M/P
(3) Stabilization of farmers' income	Improvement of land productivity in the field of rain-fed agriculture	<ul style="list-style-type: none"> <li>The utility of fertilisers and seeds is already widely recognised by residents. The supply of production materials is dependent on private economic activity and is mainly made under micro credit, but a subsidy of 20% is offered for the production materials per UPA/ha for the purpose of ① further encouraging motivation in the initial stage of the project and ② building up a stable micro credit fund (residents' contributions are deposited as the micro credit fund).</li> </ul>
	Promotion of small-scale vegetable cultivation	<ul style="list-style-type: none"> <li>There are many villages that desire vegetable cultivation. Technical training to enable the residents to develop vegetable fields independently is planned in these and surrounding villages and is included in the M/P.</li> <li>One training is not enough to improve cultivation skills. Therefore, training in vegetable cultivation is divided into 3 courses, elementary, intermediate and advanced, in order to teach advanced technology in stages in line with the technical level.</li> <li>Marshes are unsuitable as irrigation water sources and marsh construction is not included in the M/P.</li> </ul>
	Cereal bank construction	<ul style="list-style-type: none"> <li>It takes about 2 years after construction of the bank to acquire the techniques for cash control and facilities management. The necessary follow-up training is provided for 2 years.</li> <li>The key condition for stable management is to secure the initial stock. Therefore, the following measures are taken: ① establishment of adoption standards including a penalty clause in which the initial stock is the residents' responsibility; ② collection of initial stock starting from the year prior to construction.</li> </ul>
	Project to introduce improved fodder plants	<ul style="list-style-type: none"> <li>The problems of imported seeds (stylosantes) include high cost and difficult popularization. Therefore, the establishment of a seed supply system in Mali is included in the M/P.</li> </ul>
	Manufacture of livestock nutritional blocks and promotion of sheep fattening	Reinforce the contents of training program
	Improved poultry house construction and introduction of improved breeds	
	Construction of vaccination facilities	<ul style="list-style-type: none"> <li>The structure of the facilities is such that maintenance and operation are easy for farmers. The fence has no iron gate at the entrance, but is a simple structure of bars.</li> </ul>
	Mini-nursery construction project	<ul style="list-style-type: none"> <li>Extension workers provide guidance on the responsibilities of administrators and clarification of wages.</li> <li>Extension workers provide guidance to ensure the formulation of a sapling supply plan by each CGTV that specifies production in mini-nursery fields in the village and purchase of seedlings from outside.</li> </ul>
(4) Conservation and management of natural resources	Afforestation promotion project	<ul style="list-style-type: none"> <li>Extension workers provide guidance to ensure protection of groups of trees rather than individual trees.</li> </ul>
Establishment of land use rules	<ul style="list-style-type: none"> <li>Residents' willingness to formulate land use agreements varies due to different natural, social and economic conditions. Introduction is promoted starting from the areas (villages) that are most enthusiastic.</li> </ul>	
Agricultural land conservation project	<ul style="list-style-type: none"> <li>A subsidy of 70% is added for carts for transporting equipment and materials to enhance residents' motivation for joint soil conservation work.</li> </ul>	

Objective	Verification Project	Items To Be Reflected in M/P
(5) Reduction of women's burden	Mill construction project	<ul style="list-style-type: none"> <li>As mill operation is difficult in villages with a low population, one mill is constructed for several low-populated villages on the basis of one per minimum 500 persons. If using a mill in another village, the distance to the village is limited to about 3km.</li> </ul>
	Improved oven promotion project	<ul style="list-style-type: none"> <li>Each village is required to provide the opportunity for residents trained in earthen ovens to transfer oven manufacturing techniques to other residents.</li> </ul>
	Handicraft promotion project	<ul style="list-style-type: none"> <li>Extension workers provide regular guidance for village residents on improvement of accounting ability and formulation of money management rules.</li> </ul>

## 8.2 General Comments

The comments and opinions obtained from the results of implementing the verification projects (changes and additions to the M/P rough draft) are as follows:

### (1) Timing and frequency of training

Even when village residents receive training, they are not used to making a daily review of what they have learned. Yet if they do not use this knowledge in their daily lives and agricultural production, they will forget it as time elapses amid their usual chores. To prevent such a situation occurring, the training should be conducted at the time the knowledge can be used. In particular, literacy training which is the basis for acquiring all skills should be started as early as possible in the dry season and repeated during the dry season. In addition, residents should be instructed to continue on-the-job (OJT) training by appointing trainees as clerks to draw up the minutes of proceedings in the Terroir Management Committee and special sub-committees. From the perspective of the residents' current technical level, it is more effective to repeat the more advanced training courses (i.e. vegetable cultivation techniques using small-scale irrigation) more than once at certain intervals. Therefore, it is planned to increase the frequency of trainings.

### (2) Promotion of the participation of women in training

The participation rate of women was extremely low when the training was implemented according to the method planned initially. Following the attempts of several methods for promoting (or improving) the participation of women in the training of the study conducted this year, the following methods are deemed most effective in consideration of the social condition of present villages.

- ① To organize a group of women only, or a group consisting mainly of women, and to provide the training. (The training will be planned separately from the men's group or the group consisting mainly of men.)
- ② To avoid providing the training for a long time during the day, and to determine the training when women are not busy with housework.
- ③ To avoid taking part in the training at night, a fact that may arouse the husband's suspicion and marital problems
- ④ To avoid the training in other villages or remote areas, and provide the training in villages where women live.
- ⑤ To use a woman as the lecturer whenever possible.

### (3) Review of contribution rates

At the beginning, when the study team proposed that the villagers should handle the financial aspect of the verification project, the concerned parties in Mali gave several objective opinions, such as "The payment for the support project should not be requested from the villagers because poor villagers would not be able to bear the cost" or "A lower amount can be accepted". However, presently, more than one and a half year after the start of the verification project, the ability of villagers to bear the costs has improved judging from the balance between the active motivation of villagers to handle the project and the expected profit from the project. The ratio of costs to be born as established initially is determined at a too low value. The ratio of costs to be born must be re-examined in the Master Plan.

- ① Literacy classroom construction
- ② Improvement of modern wells
- ③ Improvement of agricultural road
- ④ Introduction of seeds of rain-fed crops and fertilizers
- ⑤ Introduction of vegetable seeds
- ⑥ Mill
- ⑦ Cereal bank

### (4) Promotion to provide labor

The verification project required the villagers to bear the costs and provide labor. There were some cases in which the labor was not provided as promised. A structural problem was encountered for which several projects were established during a short period of time in relation to the entire study period of this development study. In small villages, it was difficult to secure labor. Furthermore, the time when the project required for labor also mattered. The villagers gave a higher priority to the agricultural work in their own fields after the middle of May every year. They continued working until the end of the year for harvesting and storing the harvested crops. In order to promote the provision of labor, a project requiring the provision of labor for the construction of facilities must be planned from January to April whenever possible.

### (5) Timely handling of the projects showing short-term profits

The projects that are popular with the villagers and are handled with great ambition concern the "cultivation of vegetables during the dry season" and "soap manufacturing". These projects have the common merits such as: ① The individuals can achieve real profits within a short period of time, ② The products can be used by them even if they cannot be sold to people outside the village, ③ They allow to improve nutrition and hygiene through their use by the same villagers, and ④ They can be related to the improvement of the condition of women. The implementation of these projects in many villages that would take place as early as possible will be very effective by promoting the "motivation" of villagers for other projects. The fact that N'Dinzana were village in the Cinzana district, which was evaluated as a "poor Terroir Management Committee", switched to the evaluation of a "good Terroir" after a period. At that period, the improvement project of fields to cultivate vegetables during the dry season was achieved right at the time when the villagers started to cultivate the vegetables. This popular project triggered indeed a change on the village. The "cultivation of vegetables during the dry season" and "soap manufacturing" will be implemented in any villages of the project area.

(6) Mutual exchange among Terroir Management Committees

At the end of the verification study, the residents of twelve verification villages and nearby twelve villages, in all twenty-four villages, were called up for a meeting to exchange opinions among participants on the verification project. Each verification village announced one point on how they solved their problems when implementing the project, and opinions could be exchanged. As a result, the participants eagerly exchanged opinions. This type of residents' assembly could improve the motivation of residents to handle the projects. Furthermore, the farmers listened eagerly to the experiences of other advanced farmers. Another workshop is planned since this kind of opportunity for exchanging information in the form of farmers' workshop further secures positive effects on the Master Plan project.

(7) Review of introduction plan of improved pasture

Stock raising was mainly performed in the past by merely grazing. The concept for stock raising with a belief that "Feeds for livestock are free" or "No time should be spent on care for public pasture lands" was deep-rooted. The introduction of the idea of improved grass in the verification project was not popular. The increase of stock-raisers' consciousness had no advance for the following reasons ① The price of the introduced seeds for grass was expensive, ② Processing before seeding takes time (stirring of surface earth), and ③ The grazing regulations are required at the initial stage of growing the grass. Concerning the improved fodder plants, with the farmers willing to increase the production of livestock feed in their own lands, the project must be proceeded step by step. The plan must be implemented following a method that is different from that of the initial verification project, that is, seeds shall not be purchased at the market, but procured from the production and supply system managed by the Government (actually by the branch office of Cinzana IER) is improved.

(8) Review of marsh improvement

In the verification study, wells and marshes were improved as the water sources of small-scale irrigation. However, marshes were used not only as the water source of irrigation, but as the drinking spots of livestock or fish farms. The residents were worried that the drinking water of livestock might become insufficient or the fish raising period might be shortened because the volume of water in marsh would drop with the increase of irrigation. For this reason, the use of marsh water for irrigation was intentionally suppressed and vegetable cultivation was not sufficiently implemented. Marsh improvement is a project highly requested by the residents. However, the use of marsh as a water source of irrigation was deemed inappropriate and marsh improvement must be removed from the small-scale irrigation project.

## **CHAPTER 9      RECOMMENDATIONS**

This Master Plan has the objective to contribute to the prevention of desertification through the sustainable production activity of agriculture, stock raising, and silviculture. This Master Plan was formulated after its effectiveness was confirmed through the verification study. If this Master Plan will be implemented, it will become the model for the prevention of desertification not only in the study area, but in the country of Mali as well as in Sahel region. In order to smoothly implement this Master Plan, there still remain problems to be solved. The following items to be specially noted in implementing this Master Plan are recommended in this Chapter.

### **(1) Suppression of the population growth rate**

Even if the measures proposed in this Master Plan are implemented as planned, the income of UPA in the target year (2025) shall stay at the level that can maintain the present income if the population grows at the rate of 2.2% per year. This fact means that as long as the population keeps on increasing at the present rate, the income of UPA will not be improved. Thus, in order to raise the effectiveness of this Master Plan, the government should take positive steps to reduce the rate of population growth, making efforts to further promote and strengthen the Family Planning scheme that the Government of Mali has already made a start on, to improve the level of education of the people, starting with an improvement in the literacy rate, and to make further improvements in health and sanitation.

### **(2) Prediction of meteorological fluctuation and fulfillment of early warning system**

From the analysis of this study, it was clarified that the annual fluctuation of precipitation in the project area was linked with the generation of El Niño and La Niña with fairly high probability according to the long-term data. (Refer to Annexe M9.1.) With regard to El Niño, the generation mechanism is being clarified and the prediction method is being developed on the global scale.

At the start of the rainfall every year, by predicting the distribution of rainfall and precipitation during the rainy season at an early stage and giving instruction on the proper crop cultivation method through the media such as radio broadcasting, damage of the rainfed crop production caused by weather can be reduced and the yearly stable production will be achieved. It is thus recommended that the fulfillment of warning system and transmission system must be implemented by the Rural Support Department of the Government at an early opportunity,

### **(3) Administrative support for the projects that promote the land use regulations establishment**

An orderly management of natural resources (land use) is indispensable for the prevention of desertification. The support of the administration is essential in order to make the projects that promote the land use regulations establishment proposed by this Master Plan effective. To this end, the guidance of the Commune administrative staff should support the land use regulations establishment by the residents themselves, while the related local administrative organs should offer guidance so that the operation of regulations by the residents can achieve the specified objectives. Through implementation process of the verification project, the administration introduced certain measures such as the following one, that is if the fees were collected for entering pasture land or common land to collect firewood, part of the fees must be paid to the Government. This kind of measure would kill any motivation from the residents and should be prohibited.

There is no rule and regulation on the use of natural grassland at present. It is recommended that the

Rules and Regulations Bureau shall promptly formulate a rule or regulation and prepare the system so that the land use regulation on the Commune level can be smoothly formulated.

(4) Bestowing the incentive for the activity against desertification on residents

The promotion of reforestation and through conformance to the land use and grazing regulations will make it difficult to enhance the motivation for participation of residents and have the aspect of restricting the conventional customary actions of the residents. The recommendation in Item (3) above may be taken by the residents as the Administration's forcible measures such as "strengthened guidance" or "forced supervision of conformance to regulations". For the promotion of reforestation and reinforcement of land use and grazing regulations for which it is relatively difficult to get the participation of the farmers, it is recommended for the Administration not only to reinforce the guidance and regulations, but also to search for any means of bestowing the incentive on the residents.

- ① Promotion of reforestation: Setting event days such as reforestation festivals in which some materials (pots or barbed wires) or seedlings are offered as prizes to the villages that have strong willingness to reforestation
- ② Land use regulations: Supporting the setup of a meeting place with residents on enforcement of the regulations and commending excellent Communes and villages on billboards
- ③ Grazing regulations: Offering part of vaccines as prizes to the grazing groups that conform to the grazing regulations in good faith

The goals to be attained by implementing the M/P will be fixed as reasonable target values based on the results of the Verification Study.

In fixing each small goal, some programs in the M/P should be planned reasonably based on the results of the Verification Study that was implemented as a model.

(5) Support of the livestock hygiene measures and livestock improvement

In the stock raising industry, the improvement of the productivity by the efforts of herders only is limited. An administrative support is indispensable in the fields of livestock hygiene measures and livestock improvement. It is recommended that the Government should instruct to the Commune ① to strengthen the manufacturing of live vaccines under the control of the government and improve the vaccination rate by the Government's campaign, ② to strengthen the production of breeding stock in livestock improvement, and ③ as the livestock possession tax can be used at the Commune level, to use this tax for the promotion of stock raising, especially as the measures for livestock hygiene, and distribution measures.

(6) Deliberate improvement of highways

For an improvement of the distribution of agricultural goods in the farming area, the availability of better highways is indispensable. It is recommended that the maintenance and management of the existing highways be strengthened and highways be improved by the Department of the Ministry in charge.



١١٩٢