

in future prospects of the Project activities (Annex 8).

(2) Financial Aspect

The budget allocation from the MSRI has been rapidly increased as the budget for training courses and disaster surveys was added in the second year and that for the sediment related disaster prevention campaign was added in the third year. As the result, the budget amount for 2003 is more than double the amount for 2001, although the budget limitation is still a constraint on the Project activities.

Considering the MSRI's commitment to disaster management, at least the current level of budget is expected. However, further budget increase is needed for fully-fledged operation of the STC.

As the STC being a government project, no possibility for the center to start income generating or cost recovering activities is expected at the moment.

(3) Technical Aspect

Many of the counterparts are working for the STC or the RCS for many years in cooperation with the Japanese experts, so certain expertise of Japan has been absorbed and accumulated by them. In the coming years, regeneration of new staff and technology transfer from the senior staff to them are among major issues.

On the other hand, the STC does not have much experience in practical application of the expertise to local communities. Therefore it is expected that the staff further learn from activities in the model areas and in disaster site surveys.

Necessary technologies are being transferred to the Indonesian staff to fully maintain and operate the installed information network system by themselves. So the lack of appropriate counterpart of the STC is an outstanding issue for the technical sustainability of the system.

Other provided equipment is properly maintained with the registers in spite of the limited budget.

4. Revision of the Project Design Matrix and Basic Concept of Integrated Sediment-related Disaster Management

4.1. Revision of the Project Design Matrix

As part of the mid-term evaluation, the project design matrix (PDM) has been revised to better manage the Project (Annex 10).

4.1.1. Principles for Revision

For practical project management to achieve the Project purpose, the PDM has been revised as follows.

- (1) Revision of some "objectively verifiable indicators" and "means of verification" of the outputs
- (2) Revision of some "activities"
- (3) Addition of three "outputs" and the corresponding addition of "objectively verifiable indicators", "means of verification" and "activities"

4.1.2. Major Revisions

(1) Addition of Fifth Output

As the fifth output, a statement that “Disaster investigation, planning and implementation methods for disaster rehabilitation measures of devastated areas are established.” has been added. The original PDM presented a corresponding clause not as an output but as one of the related activities. However, the STC has been frequently requested for disaster surveys and the following studies. This indicates that the center is expected by various groups to play significant roles in the field. Thus, such activities should be redefined to be an output required to achieve the Project purpose.

(2) Addition of Sixth Output

As the sixth output, a statement that “Popular rainfall gauges, etc. are developed and their distribution plan is made.” has been added. In order to establish evacuation arrangement, sufficient rainfall data are indispensable. The STC therefore started to develop low-cost rainfall gauges at the outset of the Project. The development was found to be a major task involving a number of participants. The target of the distribution is not limited to the model areas. However, the component was not stated in the original PDM. Owing to its importance toward the Project purpose, it should be included as an expected output.

(3) Addition of Seventh Output

As the seventh output, a statement that “A database system for Sabo information is established.” has been added. Database development was mentioned under the title of “Related activities” in the original PDM, with no directly corresponding output item. Considering the large scope of the work and the logical structure of the PDM, the statement has been shifted from the activity level to the output level.

4.2. Basic Concept of Integrated Sediment-related Disaster Management

The basic concept of the Integrated Sediment-related Disaster Management (ISDM) is to secure the safety of communities by best synthesizing non-structural and structural measures according to the local conditions, through collaboration between the local communities and the government organizations. The non-structural measures are methods such as warning and evacuation systems and land use control regulations, while the structural measures are construction of facilities such as Sabo dams and sand pockets.

The concept has been introduced because the financial and time constraints make a full set of structural measures extremely difficult in hazardous areas. The ISDM should be implemented in consideration of low-cost practical measures and contribution to improvement of the rural living standard.

5. Conclusion

In general, training activities have been conducted well according to the schedules, while those for the model areas have made limited achievements, due to some factors difficult for the Project to control, such as the socialization and community participation. Mt. Agung Model Area has provided precious lessons that socio-cultural aspects are indispensable to participatory disaster management. The Project should take them fully into consideration.

6. Recommendations

(1) On Establishment of ISDM Models

i. Utilization of Results of Activities in Mt. Agung Model Area

The activities of the ISDM in Mt. Agung Model Area need to be analyzed and fully utilized for other cases like the one in Mt. Merapi Model Area.

In the Agung Area, various activities have been conducted such as consensus forming among the community members, collaboration with the relevant government organizations and NGOs, requests to the villagers for cooperation in maintaining and managing the Sabo Community Hall and the rainfall gauge, construction of the Obiko or river bed girdle, and investigation of water resources. The Obiko is not only for disaster management but also for improvement of the convenience by providing a carriageway.

Detailed analysis of the activities contributes a lot to efficient and effective operation of other projects such as the ISDM activities in Mt. Merapi Model Area.

It should be noted that the Obiko construction in the Agung Area still requires follow-up actions so as not to be destroyed by debris flow, which include diagnosis of the insufficient intrusion of a wing into the bank.

ii. Review of Demarcation of Mt. Merapi Model Area

The plan of the ISDM should be studied continuously such as development of Sabo facilities and also warning and evacuation systems. In order to proceed with the ISDM activities in Mt. Merapi Model Area, the demarcation of the area needs to be reviewed by considering the phenomena likely to take place there. For establishing warning and evacuation systems, the phenomena in consideration need to include not only debris flow but also pyroclastic flow. They are likely disasters against which safe pre-evacuation is possible. Detailed understanding of the phenomena in consideration is required for the re-demarcation of the target area.

iii. Budgeting for Activities of Local Counterparts in Model Areas

In order to facilitate the Project activities in the model areas, operation budgets for the activities of the OJT trainees as the local counterparts should be appropriated by relevant Indonesian authorities.

(2) On Establishment of Local Organizations and Systems for Disaster Mitigation

- Study of Kabupaten Kebumen -

Kabupaten Kebumen has favorable conditions to implement the ISDM project, as being prone to sediment related disasters and also as having ex-trainees of the WIDE course in the local government.

The government understands well the importance of disaster management, as Kebumen was the venue of the opening event of the national disaster management campaign in 2002. In case of the ISDM activities in the Kabupaten, smooth operation would be expected. It is therefore required to study the need and possibility to implement the project in Kebumen.

(3) On Training of Engineers in Disaster Mitigation

- Fostering Young STC Staff Capable of Training Sabo Engineers -

In order to continuously train engineers, it is necessary to recruit young staff members and foster them as staff capable of training domestic engineers in the field of Sabo. Thus the STC can maintain its impetus.

(4) On Establishment of Database System for Sabo Information

- Reinforcement of Counterpart Staff -

Currently one counterpart from the STC is working for the disaster information. In order to develop, maintain and manage the database and the system, at least two more staff members are needed. The current counterpart is scheduled to undergo the MPBA course at Gadjah Mada University from September 2004, and therefore prompt reinforcement is required for normal operation of the STC's information system.

The counterpart staff in the field of regional disaster mitigation currently in charge of the model areas should also be reinforced.

(5) Others

- Establishment of Organizational Status of STC -

Indonesia has a huge number of areas prone to sediment related disasters. It is feared that such disasters continue to happen every year. In order to continuously implement measures to mitigate damage done by disasters, the STC should be reinforced by the initiatives of the Indonesian side to be a permanent organization, in parallel with demarcation of the roles to be played by the center and the RCS.

In addition to the current major functions of technical guidance, human resource development, and implementation of the ISDM, the following functions should be strengthened.

The first is to collect, accumulate and analyze various types of information on sediment related disaster management measures based on its existing "Yokota" library and in collaboration with universities and other institutes. The second is to actively present analysis of causes for disasters and recommendations of the countermeasures, based on investigation of sediment related disaster sites in close coordination with other organizations. The third is to extend strong technical support to the Sabo units, which will be created in local governments.