CHAPTER 1 1

IMPLEMENTATION PLAN

11. IMPLEMENTATION PLAN

11.1 Implementation Plan for Community Disaster Prevention Plans

11.1.1 Strategy of Project Implementation for CDPPs

Figure 11.1.1 shows the implementation strategy for the CDPPs, which involves three types of sub-programs as listed below:

(1) Basic disaster prevention sub-program,

(2) Participatory disaster prevention sub-program, and

(3) Community development sub-program.

The basic disaster prevention sub-program is defined as the "Frame Project" which aims at recovering the damaged community and forming the basic frame for constructing less vulnerable community to further disasters. The basic disaster prevention sub-program is therefore mainly composed of structural disaster protective measures, which are rather costly and difficult to manage by the people's group themselves for their funding and construction. It is therefore recommended that the government takes responsibly to promote, implement and maintenance of the basic disaster prevention sub-projects.

The participatory disaster prevention sub-program is consisted of small-scale structural preventive measures such as gully control and hillside works and non-structural disaster protective measures such as evacuation system. These schemes are generally designed to be low cost and simple technologies as much as possible so that the people in the community can manage their implementation, operation and maintenance by forming disaster management committee. However, some assistance from the government or NGOs would be required in technical and financial aspects. Such participatory disaster preventive measures are like a "muscle" of the community, which will support the frame project and allow the community to become stronger against further disasters by reducing natural hazard potential at the community level.

The community development sub-program is mainly carried out under the initiative of the users' committee. The components can be defined as "blood" of the community, through which the development activities create benefits to the community and distribute them to the local people. As a result, it is expected that the people in the community would be stronger in the economic and social aspects and they can be more capable of managing disasters. In this sense, the community development schemes are essential to realise the participatory disaster prevention activities. Like the participatory disaster prevention schemes, the community development sub-projects would require some assistance from the government or NGOs in the financial and technical aspects. This kind of assistance is to be arranged by the co-ordinating agency in the central government.

Based on the above strategies, the DOSC shall commence necessary actions to implement the Community Disaster Prevention Plans. The components of these sub-projects are indicated in Figure 3.5.1 for Phedigaon / Phatbazar, Figure 4.5.1 for Namtar / Tiral, and Figure 5.5.1 for Chisapani, in which the schemes are proposed to be undertaken by the government.

11.1.2 Institutional Arrangement in Central Government

Many projects formulated in the Study are diversified in nature to a great extent: Some projects are completely engineering-oriented sabo works, some are completely community-oriented participatory rural development, and others are mixed ones. Let us call those projects sub-projects. For implementation of those various kinds of sub-projects, an implementing organisation must be required to have a tremendous flexibility in it.

The DOSC and the Study Team discussed institutional arrangement and came up with the conclusion whose diagrammatic outlook is shown in Figure 11.1.2. The most important point of all is that there must be a very strong and effective unit - it is named "PEU" in the diagram - at the core of the implementing organisation. It can be small, but it needs full understanding and support from the DOSC, as a leading agency of the HMG/N for implementation. The following is an explanation of each component in the diagram.

PEU (Project Executing Unit)

The PEU is the heart of the organisation and the engine for project implementation. The major roles assigned to the PEU are to promote, support, and, most of all, execute sub-projects. Thus the PEU will deal with all sub-projects proposed by the Study Team.

The project manager is appointed from the DOSC staff. He/she is responsible for all duties in the PEU. The PEU must be a small unit in the early stage. Besides the project manager, a project promoter is assigned to promote the sub-projects to donors. He/she contacts a variety of possible donors such as international aid agencies, INGOs, privates, etc.

Once a donor is found and if it asks the PEU to execute the sub-project it selects, the PEU strengthens its unit by employing some experts, administrators, and other staff based on the nature of the sub-project. Basically those additional members of the PEU are from the DOSC, but also possibly from other line agencies. Non HMG personnel is acceptable, too. Based on the request from and the negotiation with the donor, the PEU arranges an appropriate institutional structure for implementation right away.

PCC (Project Co-ordinating Committee)

On the top of the structure, the PCC is formed. The PCC consists of the DOSC, the DDC, and the line agencies such as the DOR, the DOF, the NEA, and the Ministry of Finance. The main purpose of forming the PCC is to co-ordinate all line agencies and to supervise the PEU. A representative of the DOSC must be the chairperson of the PCC.

The PCC should be a small committee so that it works efficiently and effectively. If it is big, there would be many ideas and plans and it would be difficult to reach consensus among the members in a co-operative way.

Since the sub-projects are so diversified in nature, there should be some support to project implementation from time to time from the line agencies. The PCC is a good place for the line agencies to communicate with each other and to find co-operative solutions.

DOSC

The DOSC plays a leading role in project implementation. The DOSC must give continuous and sufficient support in many respects to the PEU, to enable the PEU to keep functioning and accomplish its duties.

The majority of the PEU staff may be provided by the DOSC. Especially, the project manager must be from the DOSC and he/she must be quite capable of managing the PEU and the project implementation.

DDC

The PEU keeps in touch with and/or works with the DDC in implementation. In any project, as long as it is implemented in Nepal, the project site always belongs to a DDC. A good co-ordination of a project implementing agency with a DDC is a key for successful outcomes. The DDC is also a member of the PCC, but the PEU needs to maintain good co-ordination with the DDC at the regional level as well for detailed discussion in each sub-project.

Basket of Sub-projects

The basket shown in Figure 11.1.2 is merely a symbolic representation of several sub-projects formulated in the Study and being implemented by the PEU. The project promoter in the PEU goes out with the basket to the street to sell these sub-projects to the people walking there - donors. The sub-projects can be viewed as vegetables in the basket. A donor who wants to buy a vegetable picks up the best vegetable he/she wants from the basket. The donor asks the PEU to cook it together or returns home for cooking by itself.

Donor Type A

As explained above, the donor type A is the one who buys a vegetable from the basket and wants to cook it together with the PEU. It provides the PEU with resources such as fund, technology, and manpower. What kinds of resources it provides vary from donor to donor, therefore the PEU has to be flexible to accommodate those unpredictable. In addition, the donor type A may request the PEU to implement a sub-project in its way. That is, although the whole physical components of the sub-project may not change very much, the way or the strategy to implement it may change drastically in accordance with the donor's request.

Donor Type B

Unlike the donor type A, the donor type B is the one who wants to implement the sub-project by itself. The PEU promotes the sub-projects and hands them over to the donor type B. In the course of hand-over, the PEU gives full explanation on the sub-project, and if asked, gives some support during implementation.

There must not be many type B donors from international aid agencies, but most INGOs might prefer to do it in their own style.

TA (Technical Assistance)

In case that the PEU has not enough technologies for implementing a sub-project, a donor is asked to provide technical assistance to the PEU to make up for the lack in technology in the PEU. The PEU and the donor discuss what types of expertise are necessary in the TA and decide the experts to be assigned. The TA does not play a leading role in implementation, but it supplements the PEU's role with regard to technology.

UG (Users' Group)

Forming the UG is a must for implementing participatory community development projects. Most CDPP sub-projects definitely call for some contribution from the UG. The UG plays a significant role in implementation as well as operation and maintenance.

External assistance is required to form the UG. A motivator goes to the village and form the UG through group discussion and interviews. He/she can be from the PEU or the TA, or from the VDC. The UG should be registered to the HMG/N (related government offices based on types of activities) and legalised.

NGO

There may be NGOs which want to participate in the CDPP sub-projects. They may not become donors because they do not have fund and technology. Some NGOs, however, would like to be funded by the PEU to implement some community-based sub-projects. The diagram shows a possibility of this type of involvement in implementation.

Monitoring and Evaluation

Since there are multiple sub-projects to be implemented simultaneously with involvement of multiple parties, there must be an effective monitoring and evaluation unit which reports its analysis results to the PEU, so that the PEU can control and manage all on-going sub-projects efficiently.

Without the monitoring and evaluation unit, the PEU cannot monitor and control on-going sub-projects. Each sub-project may be disintegrated and cannot provide expected outputs. This unit can be in the PEU, or if a third party is better to do this, it can belong to the TA.

The unit must have stronger and much strict functions of monitoring and evaluation than those regulated by the HMG/N. This is because there will be many invisible and uncountable factors involved in community development which are too crucial to be ignored.

11.1.3 Formation of Users' Groups and Committees

The formation of users' groups and users' committee is proposed in all three CDPP priority areas as one of the priority plans. Since the detailed explanation on it can be found in Annex-6: Community Development Plan, no explanation on how to form users' group is given in this section. The purpose of this section is to discuss the formation of users' groups within the context of implementation procedure.

Whenever people are involved in a project, as long as that project is related to community/rural development, the first thing to do for implementation is to form users' groups. As seen in Figure 11.1.2, UGs play a significant role in implementing participatory community development sub-projects.

Figure 11.1.3 shows a possible structure of UGs. In this figure, a users' committee is on the top of the institutional hierarchy in the community. According to the terminology used by the HMG/N the users' committee shown in this figure is called "users' group". In order to distinguish this top users' group from sub-project-based users' groups, however, the term, "users' committee" is used instead of "users' group" in the Study. The term "users' group" in the Study is defined as a small group formed by 5 to 10 people who are usually made of relatives and neighbours.

The proposed procedure to be taken for formation of UGs and others is, firstly to form UGs, secondly to form users' committee, then finally to form users' sub-committees upon implementation of sub-projects. However, people are involved in these activities, thus no decisive procedure exists, in fact. It is better to let a capable facilitator decide the best procedure to form groups and committees.

Once users groups and committees are formed, the PEU, described in the previous section, co-operates closely with them and implement sub-projects.

11.1.4 Roles of Governments, Donors and People

Organisational matters are dealt with in the previous two sections, and now the roles of the agents involved in implementation can vary in accordance with the type of each sub-project. If a sub-project consists of only such components as physical structures and no local technology or labour is required, all the PEU has to work with are only a foreign donor and a foreign contractor. In this case, not much involvement of users' groups is expected. On the other hand, if a sub-project is a completely people's participatory project and needs only local resources and technologies, then no foreign assistance is necessary and local people must take a leading role and be very much active.

Table 11.1.1 shows a typical example of the shares of responsibilities that should be taken by governments, donors, and local people. This table does not intend to fix the shares, but it gives just an outlook of how responsibilities will be shared. This table gives some hints on the shares estimated under the current circumstances. As for management office activities, the HMG/N may be able to provide some humanpower from the HMG/N staff and office accommodation while donors will provide some fund for extra costs that HMG/N cannot afford to. As for field implementation activities, if the project to be implemented is a participatory community development project, the local people will give the things they can give as much as possible through providing labour forces and local construction materials. If the project is a construction project of physical structures, most resources will be provided by donors and there is no involvement of local people.

Sub-project by sub-project, the PEU and all other related organisations must determine a reasonable and practical allocation of shares among them in accordance with the nature of the sub-project. In the course of the Study, the Study Team has encouraged the local people to participate in the development of their communities and basically they are ready to co-operate in project implementation. The Study Team tried to quantify the degree of contribution from the local people, but they have not been sure of how they would be able to contribute. The reason for this uncertainty was that the local people could not get

serious to determine seriously how much they would contribute unless a sub-project is determined to be actually implemented in a short period.

11.1.5 Implementation of Basic Disaster Prevention Sub-programs

In each CDPP, the basic disaster prevention sub-program is proposed, which is defined as "The Frame Project" aims at recovering the damaged community and forming the basic frame for constructing less vulnerable community to further disasters. The basic disaster prevention sub-programs are therefore mainly composed of structural protective measures, which are rather costly and difficult to manage by the people's group themselves for their funding and construction. It is therefore recommended that the government takes responsibility to promote and implement such basic disaster prevention sub-programs.

Taking into account the location of three CDPP priority, it is proposed that the basic disaster prevention sub-program shall be implemented in two stages. The first phase would be for Phedigaon and Chisapani, and the second phase for Namtar. Phedigaon and Chisapani are adjacent communities and it is possible to use the same construction equipment at the same time. The damage condition is more severe, and the further disaster potential is much higher than Namtar. Accordingly, it is proposed that basic disaster prevention sub-program for Phedigaon and Chisapani shall be implemented as the first stage prior to Namtar.

Figure 11.1.4 shows proposed implementation schedule for CDPP basic disaster prevention sub-projects. The project period for phase 1 will be four years from 1997 to 2000 including the funding arrangement, detailed design, tendering and construction. Phase 2 will be continued from phase-1 which will be commenced in 1999 and completed in 2004. The annual disbursement schedule for basic disaster prevention sub-programs of CDPPs are shown in Table 11.1.2 and summarised as follows:

Funding arrangement schedule
for basic disaster prevention sub-projects of CPDDs

Unit : NRs.

Year	Phase-1 Phedigaon / Chisapani	Phase-2 Namtar	Total
1997	1,008,044	0	1,008,044
1998	7,728,338	0	7,728,338
1999	39,516,278	4,757,296	44,273,574
2000	47,751,540	16,718,498	64,470,038
2001	0	24,737,941	24,737,941
2002	0	49,043,685	49,043,685
2003	0	91,775,730	91,775,730
2004	0	84,812,350	84,812,350
TOTAL	96,004,200	271,845,500	367,849,700

The required amount is NRs.96,004,200 for Phase 1, and NRs.271,845,500 for Phase 2 respectively.

11.1.6 Implementation of Participatory Disaster Prevention Sub-programs

Participatory disaster prevention sub-programs are proposed in Phedigaon and Chisapani as the components of the CDPPs. Table 11.1.3 shows the list of sub-projects in participatory disaster prevention sub-program. There are mainly two types of sub-projects. One is to mitigate natural hazard potential on the upper most area of the communities. The proposed measures are mainly gully control works and hillside works. Another is to encourage rehabilitation works in the human society. The proposed measure is channel work.

The proposed sub-projects are designed to apply appropriate technologies, in other words, low-cost technologies, which is included stone pitching, gabion works and bioengineering works. Most of the materials can be procured near the project areas and it is possible to manage by the user's committee for their construction and maintenance activities.

In addition to the two types of participatory disaster prevention sub-projects, community disaster evacuation system and farmland rehabilitation sub-projects are also proposed as the components of participatory disaster prevention sub-projects. For these works, it is defined as the multipurpose sub-projects which aims not only to disaster prevention but also to community development.

Farmland reclamation sub-project is to rehabilitate damaged farm land by 1993 disaster and to provide the farmland to landless farmers. Community disaster evacuation system is to disseminate the hazard map to the local people and to construct the multipurpose shelter which is utilised as potato seed storage for agriculture development. In the community disaster evacuation system sub-project, it is also included the education training for disaster prevention activities to reduce the disaster potential.

Figure 11.1.5 shows the proposed implementation schedule of participatory disaster prevention sub-program for Phedigaon and Chisapani CDPPs. Considering the people's participation in project implementation, it will take long term so that many of them are busy for agriculture activities particularly from March to November.

For Phedigaon CDPP, Channel works on the Dhungakate and the Ghatte Khola on alluvium fan area shall be implemented prior to the basic disaster prevention sub-program. This sub-project is essential to rehabilitate farm land on alluvium fan area. After completion of channel works, implementation of farm land rehabilitation on alluvium fan area is physically possible. Taking into account the disaster prevention aspects, it is proposed that the farm land rehabilitation sub-project shall be done after the basic disaster prevention sub-program.

After the land reclamation of alluvium fan area, community disaster evacuation system sub-project shall be introduced. The sub-project would be preferable to hand over to NGO so that the sub-project is mainly non-structural measures and to communicate and educate the local people is essentially required.

Gully control works and hillside works are planned continuously after the above sub-projects. The works would be effective to reduce disaster potential to the alluvium fan area in long-term viewpoint. Implementation period is planned for 15 years from 2002 to 2016 to complete the works.

For Chisapani CDPP, community disaster evacuation is proposed as an immediate sub-project prior to commencement of basic disaster prevention sub-program. Because, the

whole community is in critical condition due to active land slides and gully erosion, and many houses and farm land are defined as the high hazardous zone based on the hazard assessment. Education program to disseminate hazard map and installation of community disaster evacuation system is therefore essential to maintain the community.

Gully control works and hillside works are proposed to be implemented after completion of basic disaster prevention sub-program so that the foundation structures of gully control works to support series of groundsills on the upstream are proposed in the basic disaster prevention sub-program. The gully control works would not be stable without the foundation structures.

Financial schedule for participatory disaster prevention sub-program are shown in Table 11.1.4 and summarised as follows:

Funding arrangement schedule
for participatory disaster prevention sub-program of CPDDs

Unit : NRs.

Year	Phedigaon CDPP	Chisapani CDPP	Total
1997	0	0	0
1998	9,226,600	0	9,226,600
1999	0	4,500,000	4,500,000
2000	5,000,000	0	5,000,000
2001	3,000,000	0	3,000,000
2002	2,948,960	0	2,948,960
2003	2,948,960	4,493,300	7,442,260
2004	2,948,960	4,493,300	7,442,260
2005	2,948,960	4,493,300	7,442,260
2006	2,948,960	1,898,633	4,847,593
2007	2,948,960	1,898,633	4,847,593
2008	2,948,960	1,898,633	4,847,593
2009	2,948,960	0	2,948,960
2010	2,948,960	0	2,948,960
2011	2,948,960	0	2,948,960
2012	1,250,680	0	1,250,680
2013	1,250,680	0	1,250,680
2014	1,250,680	0	1,250,680
2015	1,250,680	0	1,250,680
2016	1,250,680	0	1,250,680
TOTAL	52,969,600	23,675,800	76,645,400

The above cost is estimated under the local competitive bidding base. In case that the users' committee carries out the construction works, the cost will be decreased with 30%. It is proposed that the funding arrangement for the above shall be done by the central or local government so that the amount is too big to manage by the users' committee. It is also recommended that the adequate technical support from the government will be required for the implementation in case that the participatory disaster prevention sub-program is carried out by the users' committee.

11.1.7 Implementation of Community Development Sub-programs

Various community development sub-projects are proposed in each CDPP. They are defined as the "energy" to empower the local people for the further rural development. The reduction of regional vulnerabilities will be highly expected by implementing the sub-program so that all the community development sub-projects are proposed based on the people's needs assessment.

Table 11.1.5 shows the list of community development and participatory disaster prevention sub-projects, which is composed of 16 sub-projects in three CDPPs. Various sectors are involved in the community development sub-program such as strengthening institution, agriculture, forest, road improvement, income generation, rural electrification, communication, women in development and so on.

In view of the Study Team, the following community development sub-projects will be particularly effective to encourage, empower and spark the local people for disaster prevention and economic development activities:

(1)	Na-2C	Rural road improvement sub-project (Namtar)
(2)	Na-14C	WID through sericulture research sub-project (Namtar)
(3)	Ch-2C	Water supply network development sub-project (Chisapani)

Rural road improvement sub-project in Namtar is proposed by the local people's group, and they raised it as the first priority sub-project in Namtar. Because, their economic activities is so far quite limited and many farmers produce cereal crops for self-sufficiency. If the road is available through the year, they will change the cropping pattern and transport the products to city markets in Terai and Kathmandu. It has high potential to produce cash crop in Namtar such as fruits, garlic and ginger, and all the crops are quite valuable in the market. Considering the high potential of cash crop production , rural road improvement from Chynia (Tribhuvan Highway) to Namtar for 6.5 km will have high economic viability, and it is recommended to implement to spark the rural economic activities in Namtar.

Women in development through sericulture research sub-project is a unique idea aiming to enterprise cottage industry for women in rural area. However, it is quite difficult to promote such a women in development program in Nepal. Many women in Nepal are illiterate and they have less opportunities to be involved in economic activities. Many of them are only expected to be childbirth, child care, house keeping, cooking by the family and society due to their custom. However, the recent educational program is going to change the status of women gradually. In case of Namtar, high school is established and many schoolgirls from the surrounded villages attend school. They have 10 classes, but many schoolgirls have no way to apply their educational background in the society after graduation. The proposed sub-project is targeted the schoolgirls of classes 9 and 10. They are more or less 15 years old. Sericulture industry is light business and suitable for women, and it has high development potential to international market in future. In addition, sericulture is highly environmental affordable business which is encouraging tree plantation on the sloped land, devastated river terrace and so on. The schoolgirls who graduated class 10, can be qualified as teacher in Nepal. When they return their villages they can have vocational training classes in their villages and disseminate sericulture technologies to the other women in their villages if they have vocational training opportunities for sericulture industry in the school. The sub-project is therefore, quite unique and expectable to improve the women's situation in rural area of Nepal, and Namtar has high possibility to promote the sub-project.

Water is common needs of many villages in Nepal. In case of Chisapani, however, the expected effects of water supply network development sub-project is not limited to basic human needs but to improve income level of the local people. The water supply networks in Chisapani exist currently, but it is not distributed to all households due to limitation of water resources potential. However, the Study Team found that amount of water in the community is enough to supply drinking water to all household, and moreover, it is possible to provide sprinkler water for vegetable farming. In fact, some vegetable farmers proved to produce double cropping of cauliflower by sprinkler irrigation in Chisapani, and the other farmers fully understood the effects of sprinkler irrigation in economic viewpoints. The proposed project is quite simple. Several water storage will be provided to minimise water loss for distribution, and individual tanks with 200 litter will be installed in all households. They can manage their drinking water and sprinkler irrigation water to utilise their individual tanks. The total cost is estimated only about 3 million Nepalese rupee, but the annual benefit by sprinkler irrigation will be NRs.17 million per year.

Among the proposed community development sub-projects, the following sub-projects can be implemented within the existing government programs:

(1)	Ph-7C-11C,	
	Ch-4C	Community forestry (Phedigaon / Chisapani)
(2)	Na-3C	Rehabilitation of irrigation network (Namtar)
(3)	Na-7C	VHF wireless telephone installation (Namtar)
(4)	Ch-13C	Sloping agriculture land improvement (Chisapani)

For implementation of the above sub-projects, the concerned agencies have their regulation for the responsibility of the people's group. They have also their criteria for justification of project implementation. In fact, rehabilitation of irrigation network and VHF wireless telephone installation sub-projects have been already applied by the people's group in Namtar to District Irrigation Office (DIO) and National Telecommunication Centre (NTC) respectively. Both agencies have visited site and they have evaluated the project. For VHF wireless telephone installation sup-project have been committed by the NTC and now waiting for implementation.

For the community forestry sub-projects have been also promoted by the Study Team and the government officials from District Forest Office has visited sites.

For implementation of the community development sub-projects, it is highly expected to participate the INGOs and NGOs for their technical and financial supports to the user's committee. In fact, many INGOs and NGOs have abundant successful and unsuccessful experiences in participatory community development activities in and out of Nepal Their know-how and experiences are highly required for successful implementation for community development activities.

Important roles of the PEU in the central government are promotion and co-ordination of the community development sub-projects. Many INGOs and NGOs are interested in participating the implementation of community development sub-projects, however, they have less information to realise the sub-projects. The PEU therefore should be ready to disseminate the results of the Study, and approach them to provide technical information. Some INGOs may be interested in both of financial and technical support, but many of them have less budget to implement by themselves. In that case, the PEU is highly expected to arrange or co-ordinate the fund raising to approach the various government, private foundations and foreign donors.

11.2 Implementation Plan for Infrastructure Disaster Prevention Plans

11.2.1 Mahadevbesi Bridge IDPP

The root cause of collapse of the bridge might be the lack of in-depth river morphological study in the design stage of the bridge. The Study Team has reviewed the existing bridge design in order to apply appropriate river and sabo engineering technologies that are essential to make the bridge safer against river hazards such as flood and debris flow. Therefore, it is recommended to transfer such technologies in river / sabo engineering through the implementation of the channel stabilisation works for the Mahadevbesi bridge. This must be effective for protection of other bridges in Nepal against future disasters.

In addition, the proposed scheme will use local materials such as cement, stone, sand and biological materials to the maximum extent. It is economically feasible compared to the steel truss one-span bridge Its EIRR is estimated at 14.90%. In view of such economic viability and the urgent need for technology transfer for disaster prevention for bridges, it is recommended that the proposed channel stabilisation works be carried out by the Department of Road under proper technical assistance by expatriate experts.

11.2.2 Kulekhani Reservoir IDPP

The direct excavation measures are widely applied as the reservoir maintenance measures which have a visual benefit of sustaining the reservoir. In the case of the Kulekhani reservoir, it is expected that 1 m^3 of reservoir excavation would yield an economic benefit of 8.06 NRs/year in kW value and 11.00 NRs/year kWh value.

In addition, the financial benefit of selling the excavated sand marketing is to be taken into account. This benefit is estimated at about NRs 51.6 per m^3. It will be distributed to the villages in the watershed for their community development and watershed management activities.

Moreover, the construction of a transportation route from Kulekhani to Daksinkali would yield a tremendous amount of benefit in the VDCs along the route as well as those around the reservoir. They are expected to change the cropping pattern from cereals to cash crops gradually and the economic benefit resulting from the shift to cash crops is tentatively estimated at NRs 9,000 per ropani. The countermeasures for the reservoir sedimentation therefore greatly contribute to the rural economy for the local people in addition to the national economic benefit of sustaining the reservoir for hydropower purpose.

Although the impact is not counted in the monetable value, the sand supply to the Kathmandu valley would contribute to mitigate the seriousness of river degradation at the bridge site and such economic intangible benefit will be quite big.

Therefore, it is recommended to implement the sand resources development approach aiming to sustain the reservoir. Since the sand resources development approach would be highly feasible with an EIRR value of 24.67%, the Nepal Electricity Authority should aggressively take actions for its implementation.

Table 11.1.1 Roles of HMG, Donor, and Users Group

Cost Items	Share of Responsibility		
	HMG (%)	Donor (%)	Users Group (%)
1 Management Office Activities			
1) Project Staff			
Salary to HMG Staff	100	0	0
Salary to Other Project Staff	0	100	0
Daily Allowance to HMG Staff	0	100	0
Daily Allowance to Other Project Staff	0	100	0
2) Offices and Utilities			
Space for Project Offices	100	0	0
Communication (domestic)	100	0	0
Communication (international)	0	100	0
Other Utilities	100	0	0
Office Equipment & Stationery	100	0	0
Transportation (for staff)	0	100	0
Training Seminar, Workshop, Field Trip	0	100	0
2 Field Implementation Activities			
1) Participatory Community Project			
Construction Materials (non-local)	0	100	0
Construction Materials (local)	0	0	100
Transportation (non-local construction materials)	0	100	0
Transportation (local construction materials)	0	0	100
Construction Equipment & Machinery	0	100	0
Skilled Labor	0	100	0
Unskilled Labor	0	20 - 80	20 - 80
Land at Site	0	0	100
Operation & Maintenance	0	0	100
Management of Local Conflict	0	0	100
Training for Villagers	0	100	0
2) Other Project			
Construction Materials (non-local)	0	100	0
Construction Materials (local)	0	100	0
Transportation (non-local construction materials)	0	100	0
Transportation (local construction materials)	0	100	0
Construction Equipment & Machinery	0	100	0
Skilled Labor	0	100	0
Unskilled Labor	0	100	0
Land at Site	0	100	0
Operation & Maintenance	100	0	0
Management of Local Conflict	100	0	0

Notes: 1) "Local" means "near the project site," not "in Nepal."
2) The share of unskilled labor supply varies depending on a type of CDPP.

Table 11.1.2 Funding Arrangement for Basic Sabo Project on CDPPs

		Work Item / Sub-project	Site	Structure ID No.	Project Cost (NRs.)	1997	1998	1999	2000	2001	2002	2003	2004	Remarks
CDPP-Basic Disaster Prevention Project Phase-1 (Phedigaon and Chisapani)														
1		Funding arrangement			96,004,200	1,008,044	7,728,338	39,516,278	47,751,540	0	0	0	0	Project Cost
2		Detailed design			6,720,294	1,008,044	5,712,250							7% of Project Cost
3		Tendering			2,880,126		2,016,088	864,038						3% of Project Cost
4		Construction			86,403,780									90% of Project Cost
	(a)	Preparatory works on Phedigaon	Phedigaon					5,301,860						
	(b)	Sabo works on the Dhungakate Khola	Phedigaon	Dh-1D, 2D, Ph-3D, 7D	40,909,400			20,454,700	12,272,820					
	(c)	Nabo works on the Ghatte Khola	Phedigaon	Gh-6D~8D, Ph-2D	12,109,200				9,687,360					
	(d)	Preparatory works on Chisapani	Chisapani					4,298,560						
	(e)	Basic sabo works on Chisapani	Chisapani	Ch-1D, Dr-1D, 2D	42,985,600			8,597,120	25,791,360					
CDPP-Basic Disaster Prevention Project Phase-2 (Namtar)														
1		Funding arrangement			271,845,500			4,757,296	16,718,498	24,737,941	49,043,685	91,775,730	84,812,350	Project Cost
2		Detailed design			19,029,185			4,757,296	14,271,889					7% of Project Cost
3		Tendering			8,155,365				2,446,610	5,708,756				3% of Project Cost
4		Construction			244,660,950									90% of Project Cost
	(a)	Preparatory works	Namtar							19,029,185	8,155,365			
	(b)	Multipurpose checkdam Na-1	Namtar	Na-1D	47,141,000						18,856,400	18,856,400		
	(c)	Multipurpose checkdam Na-2	Namtar	Na-2D	55,079,800						22,031,920	22,031,920		
	(d)	Checkdam Na-3	Namtar	Na-3D	77,613,800							23,284,140	38,806,900	
	(e)	Consolidation works Na-4	Namtar	Na-4D	39,708,400							11,912,520	19,854,200	
	(f)	Channel works Na-5	Namtar	Na-5D	52,302,500							15,690,750	26,151,250	

Table 11.1.3 List of Participatory Disaster Prevention Sub-programs

No.	CDPP Area	Sub-Project ID No.	Name of Sub-Project	Sector	Sub-project Features	Objectives	Sub-Project Cost	Implementation Agency
1	Phedigaon / Phatbazar CDPP	Ph-4D, 5D	Channel works on Alluvium fan Area	Sabo	1) Channel excavation and dry stone masonry on the Dhungakate and the Ghatte Khola on alluvium fan area. 2) Concrete groundsill on the upstream end of the rivers.	1) To fix river channel on the alluvium fan area. 2) To flush sediment / debris flow to the downstream 3) To realise farm land rehabilitation on the alluvium fan area	NRs.9,226,700	DPTC
		Dh-3D-7D Gh-1D-3D	Gully Control Work on the Dhungakate and the Ghatte Khola	Sabo	1) To construct series of gabion ground-sills on 9 tributaries	1) To prevent gully erosion and farmland failures. 2) To mitigate debris flow potential on the alluvium fan area,	NRs. 29,489,600	DOSC / Local people
		Dh-8D-10D Gh-4D, 5D	Hillside Works on the Dhungakate and the Ghatte Khola basin	Sabo/ Bioengineering	1) To provide rubble masonry and tree plantation along the edge of slope 2) To provide line seeding and jute net on the slope	1) To prevent landslide and soil erosion on the slope 2) To mitigate debris flow potential on the alluvium fan area	NRs.6,253,400	DOSC or DFO /Local people
		Ph-8D	Community Disaster Evacuation System with Multipurpose Shelter	Disaster manage. / Agriculture	1) To disseminate hazard map 2) To provide disaster prevention manual 3) To provide evacuation manual 4) To construct multipurpose shelter	1) To mitigate human damage by disaster 2) To save agriculture expenditure by potato seed storage (multipurpose shelter)	NRs.3,000,000	NGO or DPTC / Local People
3	Chisapani CDPP	Ch-6D, 7D	Gully Control Works on the Dharapani Khola and Tributary	Sabo	1) To provide series of gabion groundsills on the Dharapani mainstream and 2 tributaries	1) To prevent gully erosion and farmland failures.	NRs.13,479,900	DOSC / Local People
		Ch-10D	Hillside Works on the Farmland slope	Sabo/ Bioengineering	1) To provide rubble masonry and tree plantation along the edge of slope 2) To provide line seeding and jute net on the slope	1) To prevent landslide and soil erosion on the farmland	NRs.5,695,900	DOSC or DFO /Local people
		Ch-12D	Community Disaster Evacuation System with Multipurpose Shelter	Disaster manage. / Agriculture	1) To disseminate hazard map 2) To provide disaster prevention manual 3) To provide evacuation manual 4) To construct multipurpose shelter	1) To mitigate human damage by disaster 2) To save agriculture expenditure by potato seed storage (2 multipurpose shelters)	NRs.4,500,000	NGO or DPTC / Local People

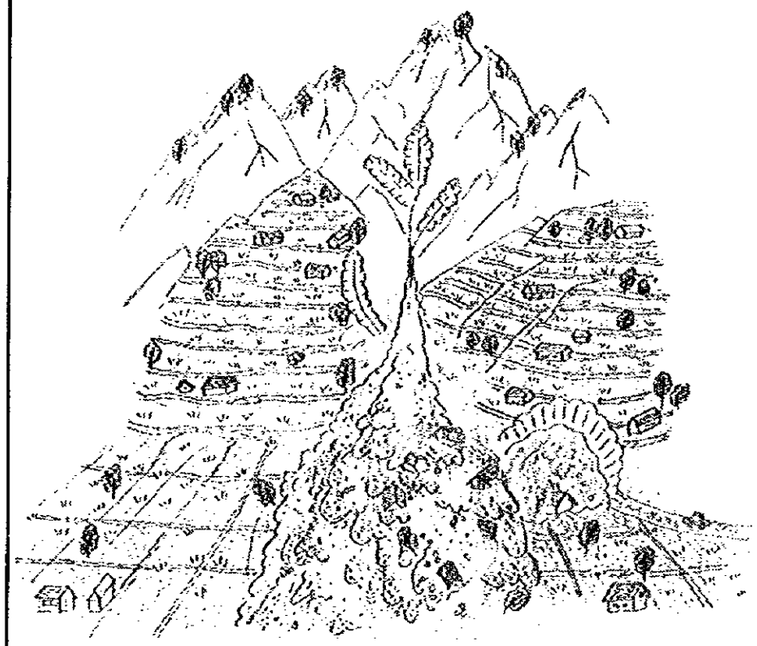
Table 11.1.4 Funding Arrangement for Participatory Disaster Prevention Sub Project on CDPPs

Unit :NRs.

		Work Item / Sub-project	Structure ID.No	Project Cost (NRs.)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Remarks
Phedigaun CDPP-Participatory Disaster Prevention Sub-projects																									
1		Funding arrangement		52,999,600	0	9,226,600	0	5,000,000	3,000,000	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	1,250,680	1,250,680	1,250,680	1,250,680	1,250,680	
2																									
	(a)	Channel works	Ph-4D, 5D	9,226,600		9,226,600																			
	(b)	Farmland reclamation	Ph-6C	5,000,000				5,000,000																	
	(c)	Community disaster evacuation system	Ph-8D	3,000,000					3,000,000																
	(d)	Gully control works	Dh-3D~7D, Gh-1D~3D	29,469,600						2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960	2,948,960						
	(e)	Hillside works	Dh-8D~10D, Gh-4D, 5D	6,253,400																1,250,680	1,250,680	1,250,680	1,250,680	1,250,680	
Chisapani CDPP-Participatory Disaster Prevention Sub-projects																									
1		Funding arrangement		23,675,800	0	0	4,500,000	0	0	0	4,493,300	4,493,300	4,493,300	1,898,633	1,898,633	1,898,633	0	0	0	0	0	0	0	0	
2		Implementation																							
	(a)	Community disaster evacuation system	Ch-12D	4,500,000			4,500,000																		
	(b)	Gully control works	Ch-6D, 7D	13,479,900							4,493,300	4,493,300	4,493,300												
	(c)	Hillside works	Ch-10D	5,695,900										1,898,633	1,898,633	1,898,633									

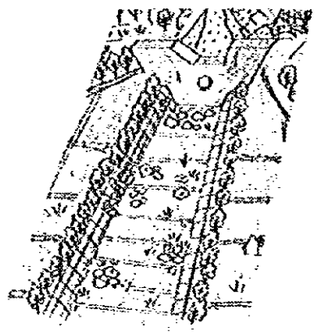
Table 11.1.5 List of Community Development Sub-program

No.	CDPP Area	Sub-Project ID No.	Name of Sub-project	Sector	Sub-project Features	Objectives	Sub-project Cost	Implementation Agency
1	Phedigaon / Phathazar CDPP	Ph-1C	Formation of User's Committee	Institution	1) To formulate user's committee 2) To foster community organiser	1) To promote community development sub-programs by people's initiative. 2) To empower local people for sub-project implementation, operation and maintenance	NRs. 300,000	NGO / DOSC
		Ph-6C	Farmland rehabilitation on Alluvium Fan Area	Disaster recovery	1) To remove debris material by bulldozer 2) To provide soil on the devastated area	1) To recover lost farm land by 1993 disaster. 2) To provide farm land to landless farmers	NRs. 5,000,000	DDC / /Local people
		Ph-7C - 11C	Community Forestry on 5 Areas	Forest	1) To transfer government forest to user's group. 2) To manage and maintain the existing forest by local people	1) To promote sustainable use of forest resources. 2) To maintain existing forest in the community	NRs. 1,500,000	DFO / Local People
		Ph-14C	Agro Forestry Program on Private Farm Land	Agriculture / Forest / Soil conservation	1) To provide nursery of fruit / medicinal trees in the community 2) To encourage local people to plant trees on sloped farm land	1) Improve agriculture income. 2) Soil conservation on sloped land	NRs. 3,500,000	NGO / Local People
2	Namtar CDPP	Na-1C	Formation of User's Committee	Institution	1) To formulate user's committee 2) To foster community organiser	1) To promote community development sub-programs by people's initiative 2) To empower local people for sub-project implementation, operation and maintenance	NRs. 300,000	NGO / DOSC
		Na-2C	Improvement of Rural Road from Chynia to Namtar	Road improvement/ Disaster prevention along Road	1) To provide slope protection measures on 5 areas. 2) To provide drainage along the road	1) To pass the road during the rainy seaso 2) To encourage cash crop production in Namtar, 3) To stimulate rural economic activities	NRs 4,739,000	NGO or DDC / Local People
		Na-3C	Rehabilitation of Irrigation Network	Agriculture / Disaster recovery	1) To rehabilitate the broken irrigation system for 50ha.	1) To recover the disaster damage 2) To improve agriculture income	NRs. 5,026,000	DIO / Local People
		Na-7C	Crop Diversification Program	Agriculture	1) To provide nursery and technical demonstration farm 1) To change cropping patter from cereals to cash crop (Garlic, Ginger)	1) To increase agriculture income 2) To stimulate rural economic activities	NRs. 2,500,000	NGO / Local People
		Na-8C	Micro-Hydropower Plant Installation	Rural electrification	1) To divert water from Checkdam Na-1 2) To construct micro-hydropower Plant (20kW)	1) To realise rural electrification 2) To collect electricity tariff and to save for community development activities	NRs. 7,836,000	NGO or MOLD / Local People
		Na-11C	VHF Wireless Telephone Installation	Communication	1) To install VHF telephone 2) To formulate user's committee for operation and maintenance	1) To improve communication measures for emergency case. 2) To improve agriculture marketing for getting market price information 3) To collect telephone fee from users and to save for development activities	NRs. 50,000	NTC and NGO / Local People
		Na-14C	WID through Sericulture Research	WID / Income generation / Environment	1) To provide vocational training class in school for girls in Class 9 and 10. 2) To provide sericulture research center (Namtar School.	1) To educate schoolgirls for sericulture technologies 2) To realise sericulture and disseminate in and around the community 3) To provide job opportunities for women	NRs.1,000,000	NGO / Local People
3	Chhapani CDPP	Ch-1C	Formation of User's Committee	Institution	1) To formulate user's committee 2) To foster community organiser	1) To promote community development sub-programs by people's initiative. 2) To empower local people for sub-project implementation, operation and maintenance.	NRs. 300,000	NGO / DOSC
		Ch-4C	Community Forestry on Chuliban	Forest	1) To transfer government forest to user's group. 2) To manage and maintain the existing forest by local people	1) To promote sustainable use of forest resources 2) To maintain existing forest in the community	NRs. 1,000,000	DFO / Local People
		Ch-2C	Water Supply Network Development	Water supply / Agriculture	1) To develop water pipe network, storage tank, and individual tank, and sprinkler	1) To attain efficient usage of limited water. 2) To connect water-tap for all houses 3) To realise sprinkler irrigation for vegetable farming	NRs. 3,070,000	NGO / Local People
		Ch-13C	Sloping Agriculture Land Improvemen	Agriculture / Soil conservation	1) To level the farm land on the slope 2) To plant trees on the edge of sloped farm land with protection works	1) Soil conservation on sloped farmland 2) To provide livestock feed by tree plantation	NRs. 2,500,000	DFO or NGO / Local People
		Ch-14C	Agro Forestry Program on Private Farm Land	Agriculture / Forest / Soil conservation	1) To provide nursery of fruit / medicinal trees in the community 2) To encourage local people to plant trees on sloped farm land	1) Improve agriculture income. 2) Soil conservation on sloped land	NRs. 3,500,000	NGO / Local People



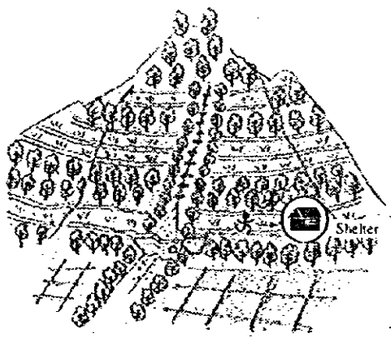
Severe Damage to the Community

BASIC DISASTER PREVENTION WORK
(GOVERNMENT WORK)

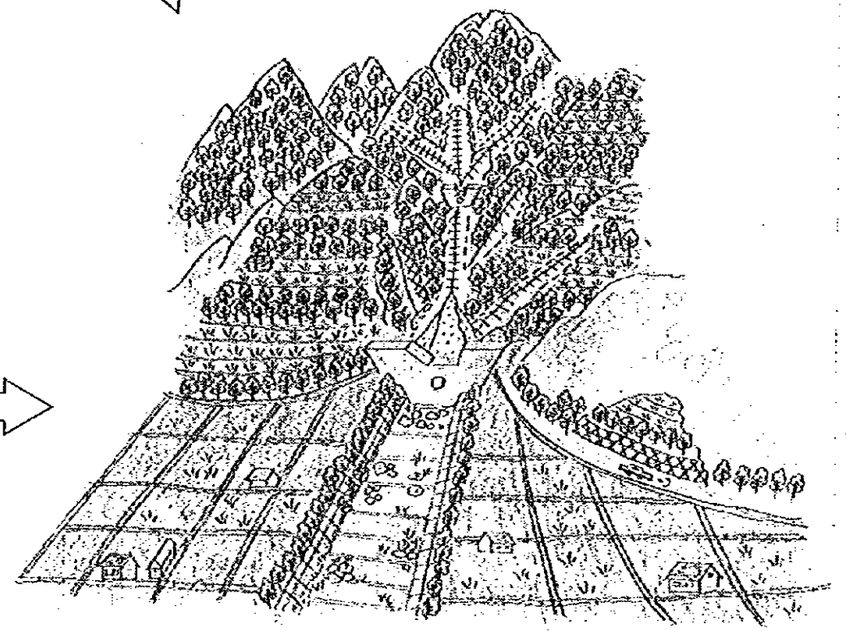


Checkdam, Channel Work

PARTICIPATORY
DISASTER PREVENTION WORK



Gabion Groundsills,
Tree Plantation, Cartour Farming,
Evacuation System

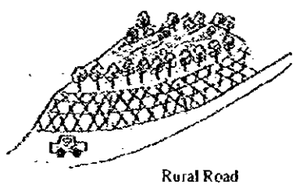


Successful Community Disaster Prevention
and Community Development(CDPP)

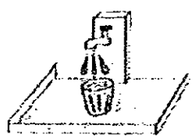
FORMATION OF THE COMMITTEE
BY LOCAL PEOPLE

GO/NGO
Support

COMMUNITY DEVELOPMENT WORK

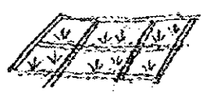


Rural Road



Water Supply

Community Forestry/Agro-Foresty



Rural Irrigation Agriculture Development

Fig. 11.1.1
Implementation Strategy for the CDPP

His Majesty's Government of Nepal Ministry of Forest and Soil Conservation/Department of Soil Conservation
THE STUDY ON THE DISASTER PREVENTION PLAN FOR SEVERELY AFFECTED AREAS BY 1993 DISASTER IN THE CENTRAL DEVELOPMENT REGION OF NEPAL
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 11.1.2
Institutional Arrangement

Fig. 11.1.3
Organisational Structure of Community

Fig. 11.1.4
Implementation Schedule for Basic Sabo Project on CDPPs

His Majesty's Government of Nepal
Ministry of Forest and Soil Conservation/Department of Soil Conservation
THE STUDY ON THE DISASTER PREVENTION PLAN FOR SEVERELY AFFECTED AREAS BY 1993 DISASTER IN THE CENTRAL DEVELOPMENT REGION OF NEPAL
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 11.1.5
Implementation Schedule for Participatory Disaster Prevention Sub-project on CDPPs

His Majesty's Government of Nepal
Ministry of Forest and Soil Conservation/Department of Soil Conservation

THE STUDY ON THE DISASTER PREVENTION PLAN FOR SEVERELY AFFECTED AREAS BY 1993 DISASTER IN THE CENTRAL DEVELOPMENT REGION OF NEPAL

JAPAN INTERNATIONAL COOPERATION AGENCY