

## 2. Project Achievement

### 2.1. Inputs

#### 2.1.1. Inputs from Japanese side

The following inputs have been provided by JICA for the Project.

##### (1) Dispatch of Experts

Currently six long-term experts are assigned. In addition, a total of 40 short term experts have been dispatched including those for preparing and conducting the Water Induced Hazard Courses at Tribhuvan University. (Annex 3)

Title of assignment	Name	Period of assignment
Chief advisor	Mr. Koji KAMEE	1 September 1999 – 31 December 2001
	Dr. Ryosuke TSUNAKI	17 December 2001 – 22 July 2003
	Mr. Yuji MORIYAMA	6 July 2003 (- 31 August 2004)
Project coordinator	Mr. Kenichi SASAKI	1 September 1999 – 5 October 2001
	Mr. Sakae YAMADA	22 September 2001 (- 31 August 2004)
Community disaster mitigation planning	Mr. Kuniaki KANSHA	26 October 1999 – 27 March 2002
	Mr. Masaki HIRUMA	17 March 2002 (-31 August 2004)
River improvement	Mr. Kazuaki IRIGUCHI	26 October 1999 – 31 March 2002
	Mr. Koji ISHICHI	17 March 2002 (-16 March 2004)
Sediment-related disaster mitigation	Mr. Satoru MORIKAWA	22 September 1999 – 31 March 2002
	Mr. Naoki OMOTO	17 March 2002 (-16 March 2004)
Disaster rehabilitation	Mr. Shinji YAMAGUCHI	11 May 1999 – 10 May 2001
	Mr. Takeshi FUKADA	15 May 2001 – 14 May 2003
	Mr. Yoshinaga SUMI	26 May 2003 (-31 August 2004)

##### (2) Counterpart Training

A total of 21 counterparts received training, consisting of 18 members trained in Japan under the counterpart training scheme, one member in Indonesia under the third country training scheme, and four senior members, two of whom were also trained under the first scheme, participated in courses and workshops outside Nepal. (Annex 4)

Nine members out of the 18 members trained in Japan left the DWIDP. Among the above four senior members, only one member remains in the DWIDP. However, most of them were transferred to government agencies concerning disaster mitigation.

##### (3) Provision of Equipment

The Japanese side has provided vehicles, construction machines/tools, survey and measurement equipment, visual equipment and office processing equipment, which total approximately at Rs 64 million including the planned amount for 2003/2004 fiscal year.

The equipment is maintained and operated properly. (Annex 5)

Value of Provided Equipment (Unit : Nepalese Rupees (Rs))

Japanese Fiscal Year (April - March)	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004 (Plan)	Total
Amount	42,271,822	19,048,903	2,494,800	0	109,000	63,924,525

Note : The above includes equipment purchased by the JICA headquarters only.

On 2 March 2004, Japanese Yen 100 = Rs 67.70 and

US1 = Rs 73.85.

**(4) Local Cost Disbursement**

The local operation cost disbursement by JICA is as follows. The total amounts approximately at Rs 49 million including the planned disbursement for 2003/2004 fiscal year.

Local Cost Disbursement (Unit : Nepalese Rupees (Rs))

Japanese Fiscal Year (April - March)	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004 (Plan)	Total
	1,301,823	5,686,362	5,197,232	15,112,494	21,648,628	48,946,539

**2.1.2. Inputs from Nepalese Side**

The following inputs have been provided by the Nepalese side.

**(1) Assignment of Counterpart Personnel**

The Director General of the DWIDP and the staff of the Research, Training and Monitoring Division are defined as the counterparts including operational/clerical staff of the DMSP. Currently, a total of 41 members are assigned, excluding temporary staff. The division has five technical sub-divisions for (1) sediment related disaster mitigation (landslides), (2) community disaster mitigation planning (sabo), (3) river improvement, hydraulic laboratory and planning, (4) disaster rehabilitation, and (5) information (GIS, database), training, studies and publication. (Annex 6)

Out of the 41 members, six members rejoined the DWIDP after a period of working for different offices and one member is currently dispatched from the DSCWM.

The number of the counterparts has been considerably increased in recent years. It was 26 in September 1999, 25 in December 2001 and is currently 41. Among them, engineers increased from 6 in 2001 to 14 at present.

**(2) Provision of Land and Facilities**

The office is accommodated by the building constructed by Japan's grant assistance scheme in a government compound. The laboratory is located at Godawari compound and the garage for the construction machines is located at Baneshwar compound.

**(3) Disbursement for Running Expenses**

The DWIDP's disbursement was approximately Rs 76 million in 1999/2000 fiscal year (16 July 1999 - 15 July 2000), Rs 51 million in 2000/2001, Rs 74 million in 2001/2002 and jumped to Rs 671 million in 2002/2003 due to the merger of the river training division and disaster rehabilitation operations. (Annex 7) The budget for 2003/2004 is Rs 616 million, of which the DMSP budget or the counter budget to the Project is around Rs 160 million.

The budget is still tight for extensive activities of the Nepalese staff.

S.O.

*[Handwritten signature]*

## **2.2. Outputs**

The achievements of the outputs through the corresponding activities are summarized below. (Annexes 8, 9, 10 and 11)

### **2.2.1. Output 1. "Disaster mitigation measures and construction methods suitable for local environment will be identified."**

For the Output 1, four model sites were selected, namely, Dahachowk Model Site for sabo, Girubari Model Site for sabo and river improvement, Kathmandu - Naubise Road Model Site for landslides, and Bagmati Model Site for landslides. Girubari Site can be subcategorized into the upstream part for sabo and the downstream part for river improvement. In Bagmati Site, there are actually two sites for construction against landslides, Bungamati Site and Chalnakhel Site.

#### **(1) Dahachowk Model Site for Sabo**

The following major activities were implemented together with technology transfer to the counterparts according to the plan.

- 1) Organizing the users' group and agreement on annual activity plans with the group.
- 2) Development of low cost technologies and methods for disaster mitigation such as gabion check dams and bio-engineering.
- 3) Construction of nurseries of plants to prevent sediment discharge, fostering the nursery operators and operation of the nurseries.
- 4) Planting and bamboo fencing to stabilize the land.
- 5) Awareness raising activities (seminars and evacuation drills).
- 6) Disaster mitigation education at three primary schools.

The warning and evacuation system is scheduled to be established well before the rainy season in 2004.

#### **(2) Girubari Model Site (Upstream) for Sabo**

The following activities were implemented together with technology transfer to the counterparts.

- 1) Organizing the users' group and agreement on annual activity plans with the group.
- 2) Development of low cost technologies and methods for disaster mitigation such as retaining walls to stabilize three slope failure sites.
- 3) Construction of nurseries (1 main nursery and 5 sub-nurseries), fostering nursery operators and operation of the nurseries.
- 4) Planting trees.
- 5) Awareness raising activities (seminars).

Due to the security risks, the upstream areas have not been surveyed and so the volume of the sediment discharge can not be estimated. Therefore, the work for the upper reach can not be completed. Regulations to control actions causing sediment related disasters have not been institutionalized.

#### **(3) Girubari Model Site (Downstream) for River Improvement**

After the basic agreement on the project activities with the users' group representing the catchment area, the community members actively participated in disaster mitigation activities initiated by the Project. As knowledge and experiences accumulated through the participation, the group members became increasingly committed to the disaster mitigation activities.

The community members participated in the river improvement works by the DWIDP and then the

users' group became able to implement by themselves the works with external support of only the materials and machines.

The users' group held seminars for community members with video shows and distribution of pamphlets. As a result, the awareness of disaster mitigation was thought to have been raised considerably.

The users' group is establishing an information dissemination function and an implementation function. The community members are becoming more conscious to address disasters. Thus, they have founded the base of a disaster prevention group.

The disaster mitigation education was conducted at a primary school near the model site. A set of surveys revealed that the education was effective to raise awareness of not only the pupils but also the members of their families and communities.

For Bhagra, a center of the area, a warning and evacuation map is prepared and publicized by pamphlets and boards.

A warning and evacuation system is scheduled to be established by the community members within the Project period. The system will need to be monitored in the coming years.

#### **(4) Kathmandu - Naubise Road Model Site for Landslides**

For this model project, the staff of the local office of the Department of Roads were defined as the target group of technology transfer instead of a users' group of communities because the road is a national artery and the countermeasures were in urgent need. Through field explanation and lectures, the staff learned the importance of the maintenance and landslide measures of roads.

Major activities done are as follows.

- 1) Preparation of a disaster potential map.
- 2) Design of disaster mitigation works.
- 3) Implementation of model works.
- 4) Preparation of posters, calendars, pamphlets and sign boards.
- 5) Technical proposal to the Department of Roads of the Ministry of Physical Planning and Works.
- 6) Conducting disaster mitigation education at primary schools and evaluation of the effects.

Textbooks prepared by the Project were distributed to the fifth grade pupil and video shows were held at each of the three schools. At one of the schools, not only the pupils but their family members and neighborhood communities participated in the video show.

#### **(5) Bagmati Model Site for Landslides**

At Bungamati Site, a users' group was organized by the villagers. According to the recommendation of the village development committee (VDC), the construction was implemented by the group. However, due to the delay of the commencement of the model project, the construction will not be completed within the Project period.

At Chalnakhel Site, landslide surveys are currently on-going. Whether the design of the works will be finalized by the end of the Project period is questionable.

As the disaster mitigation education for Bagmati Model Site, the textbooks were distributed to the fifth grade pupil and video shows were held at three schools.

The progress of the planned activities of Bagmati Model Site can be summarized as follows.

Activity 1-1 Plan disaster mitigation activities in the target areas.

	Bungamati Site	Chalnakhel Site
1-1-1 Identify criteria for model site selection	Completed.	
1-1-2 Identify model sites	Completed.	Completed.
1-1-3 Conduct detailed surveys	On-going.	On-going.
1-1-4 Prepare site plans	Detailed schedule needs to be adjusted.	Detailed plan and schedule need to be prepared.
1-1-5 Develop hazard maps (landslide distribution maps)	Completed.	
1-1-6 Monitor and evaluate model works	To be continued.	To be continued.
1-1-7 Fixed point observation	To be continued.	To be continued.

Activity 1-2 Apply appropriate disaster mitigation technologies and methods in the target areas.

	Bungamati Site	Chalnakhel Site
1-2-1 Identify and design appropriate technology and construction methods	Detailed adjustment of the design with the feedback from the implementation is needed.	Whether design can be completed by August 2004 is unknown.
1-2-2 Implement model works	The on-going construction by the HMG will not be completed by August 2004.	Implementation will not be started before August 2004.
1-2-3 Evaluate technology	To be continued.	To be continued.

Activity 1-3 Promote participatory disaster mitigation activities and educate communities in the target areas.

	Bungamati Site	Chalnakhel Site
1-3-1 Develop materials	Completed.	
1-3-2 Advocate and educate communities	Due to the absence of elected VDC chairmen and weak community ties, community awareness activities have not been started. DME activities were done at three schools.	
1-3-3 Evaluate participatory activities	To be continued.	

**2.2.2. Output 2. "Disaster rehabilitation will be strengthened through technical support of Department of Water Induced Disaster Prevention (Disaster Mitigation Support Programme)"**

The Disaster Survey Committee comprises (1) Department of Irrigation (DOI), Ministry of Water Resources, (2) Department of Roads (DOR), Ministry of Physical Planning and Works, (3) Planning and Special Service Division of Ministry of Home Affairs (MOHA), (4) Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), Ministry of Local Development, (5) Department of Electricity Development (DOED), Ministry of Water Resources, (6) Department of Soil Conservation and Watershed Management (DSCWM), Ministry of Forest and Soil Conservation, and (7) Department of Water Induced Disaster Prevention (DWIDP), Ministry of Water Resources as the secretariat. The DOI, the DOR, the MOHA and the DWIDP are the original members and the DOLIDAR, the DOED and the DSCWM later joined the committee.

*POA*

*S.O.*

The Nepal Electricity Authority (NEA) is an observer of the committee so that eight of the ten departments concerned with social infrastructure are involved.

The Disaster Survey Committee meetings are held annually and the results are published as Disaster Survey Committee Reports. The reports including disaster survey reports and disaster rehabilitation plans were distributed to the eight DSC members including the NEA as well as some VDC offices, division offices of the DWIDP and some communities. So far four meetings were held in April 2001, February 2002, January 2003 and February 2004.

The DWIDP conducts surveys for disaster rehabilitation annually in cooperation with local agencies and communities.

The DSC selects disaster rehabilitation model sites from candidate sites requested by relevant organizations and local communities. Then the DWIDP implement the selected rehabilitation works. It is also monitoring the effects of the rehabilitation.

So far, participatory disaster rehabilitation works have been conducted at four rehabilitation model sites, namely Bhimdhunga, Dhapakhel, Mahuli River and Khado River. While, disaster rehabilitation seminars were held at four other sites, that is Matihani VDC, Mahottali District, Barmajhiya VDC, Saptari District, Parroaha VDC, Rupandehi District, and Dhapakhel VDC, Kathmandu District.

At the Disaster Survey Committee meetings, discussions and improvements were made of the framework of disaster rehabilitation at a national level, operational procedures and criteria for selection of rehabilitation sites.

It is noted that no institutional set up has been established at local levels. So far, no local government units are taking similar actions. For example, no survey is conducted by local government units for their disaster rehabilitation measures. The corresponding committees at local levels of the district development committees and the village development committees are expected to be established for disaster rehabilitation.

The River Training Division of the Department of Irrigation was shifted to the DWIDP in order to combine and streamline organizations against water induced disasters. The reorganization was decided in 2002 and executed at the beginning of 2003. At present, the DWIDP consists of two divisions, namely the Research, Training and Monitoring Division (with some 40 members) and the Study and Implementation Division (with some 170 members). The former is the original DWIDP supported by the JICA's Disaster Mitigation Support Programme Project. The latter is the original river training division with affiliated seven division offices and five sub-division offices, which together cover all the 75 districts of Nepal.

The management of the DWIDP intends to widen the scope of work of the 12 local offices from river training to countermeasures against water induced disasters, by technology transfer from the DMSP and the Research, Training and Monitoring Division to the Study and Implementation Division and the local offices.

The DWIDP is proposing to implement one model project in each of the 12 divisions.

### **2.2.3. Output 3. "Sharing of disaster information and disaster mitigation technology will be improved."**

The computers and their accessories in the DWIDP have been well arranged.

The website of DWIDP/DMSP was opened to disseminate information of the activities and to raise awareness of disaster prevention. Information on disasters has been collected from newspapers and Ministry of Home Affairs. Information on technologies has been taken over from the Phase I DPTC Project. The website of the DWIDP/DMSP has been accessed over 500 times.



A local area network was established in the Research, Training and Monitoring Division of the DWIDP in order to search and share the data available in the department. Now over 70% of the technical staff exchange data by means of the network. An internal workshop was held for the staff to learn how to utilize the system.

Disaster potential maps of all the 75 districts of Nepal as well as a disaster potential map of the Kathmandu - Naubise Road are being prepared based on the GIS. They are being distributed to relevant organizations such as DOHM, MOHA and DOLIDAR.

The DMSP's periodicals, "DWIDP Disaster Review" and "DWIDP Bulletin", are annually publicized and distributed to relevant organizations.

Besides the disaster rehabilitation model sites selected by the Disaster Survey Committee, the disaster rehabilitation team of the DWIDP visited various areas hit by disasters of the rainy season and advised local people on disaster prevention and mitigation. Disaster surveys were conducted at the local request of Gairi Tole, Dhapasi, Kirtipur, Matatirtha, Marsyangdi Power Plant and disaster rehabilitation seminars were held in local districts.

Technical proposals of Mugling - Narayanghat Road and of debris flow in Chitwan District were submitted to the DOR.

The information dissemination to concerned government offices is indicated by the following figures and is thought to be a fair achievement.

- 1) The total number of participants of the training courses by the DWIDP/DMSP is estimated to be 110 including one advanced course to be held after the currently on-going general course.
- 2) The total number of participants of six seminars/workshops is approximately 90.
- 3) The number of participants of the meeting on the GIS was five.
- 4) The total number of distributed pairs of the Disaster Review and the DWIDP Bulletin is 350.

It is noted that cooperation by exchanging and sharing detailed disaster information is not adequately close among government agencies as well as other relevant organizations for disaster mitigation. Therefore, organizations related to disasters such as the JCC members, the DSC members and relevant international organizations should strengthen the cooperation and the exchange and sharing of the information. A GIS Coordinating Committee has already been set up.

In 2000, water induced hazard courses were set up in the water resources engineering master program of Institute of Engineering of Tribhuvan University. With the support of short-term experts, preparation of textbooks, instructions for experiments, and counterpart training of Nepalese lecturers in charge were followed by smooth operation of the courses.

The courses for 20 students started in August 2001 and the first group graduated in June 2003. They were selected from over 60 applicants. Among the students, 60 - 70% are government officers. The graduates of the program generally have high competence and reputation. For example, recently the Nepal Electricity Authority announced vacancy of 32 engineers and eight graduates of the program were employed out of the 800 applicants. One of the graduates was admitted to the doctor course of the Disaster Prevention Research Center of Kyoto University.

In 2003, the Institute of Engineering set up the Centre for Disaster Studies (CDS) for research and training such as non-degree short-term training for school teachers on various disasters not limited to water induced ones.

The Institute and the DWIDP/DMSP have had good relations for a long time and the contribution by the Project to the commencement of the new courses is highly appreciated. The Institute expects to maintain close cooperation with the DWIDP/DMSP.

**2.2.4. Output 4. “Awareness on disaster mitigation among HMG/N and communities will be raised.”**

At the annual Joint Coordinating Committee meetings, the DMSP members submitted proposals on activities to be done by the DWIDP and related organizations.

The disaster mitigation education was recommended to the MOES and other relevant organizations for its strong impact and effects confirmed through the activities at the model sites.

Discussions have recently started between the DWIDP and the MOES for nationwide expansion of the disaster mitigation education.

For raising awareness of local communities on disaster mitigation, roving seminars were held at 11 areas and disaster rehabilitation seminars at four disaster-hit areas seeking for rehabilitation as explained in Section 2.2.2.

In addition, publications were distributed to village development committees of disaster prone areas.

The achievement is indicated by the following figures totaling approximately at 400 VDCs and is thought to be satisfactory. (The following three categories basically cover different areas and their duplication is negligible.)

- 1) The various disaster mitigation awareness activities took place in model sites involving some 100 VDCs.
- 2) A total of 11 roving seminars covered approximately 80 VDCs.
- 3) The information, education and communication materials for disaster mitigation such as posters, pamphlets, calendars and reports were distributed to some 70 chief district officers and 150 VDCs totaling at 220 destinations.

School education is a very important means for disaster mitigation. Based on the DME activities of the Project mainly at the model sites, the DWIDP intends to expand the activities nationwide by utilizing its 12 local offices and by cooperating with the MOES. The DWIDP has already had many interactions with the Curriculum Development Center of the MOES. The disaster mitigation may be incorporated in the environmental education.

**2.3. Project Purpose**

The Project purpose is that countermeasures for water induced disasters by HMG/N and communities will be promoted.

The JCC member agencies, that are government organizations concerned with water induced disasters, are benefiting from the achievements of the Project as indicated in interviews with key persons of the organizations shown below.

Communities especially those in the model sites and the rehabilitation sites have been reached by the Project and provided with various opportunities for awareness on disaster mitigation.

NPC	The disaster mitigation is one of the nation’s priority areas for it supports poverty alleviation. The work done by the Project is highly appreciated.
MOHA	The MOHA is the secretariat of the National Disaster Relief Committee, an overall center for disaster relief. The MOHA has been working closely with DWIDP and appreciate its technical and material support for disaster rehabilitation. Coordination should be strengthened, and GIS maps can be effectively utilized.

S.O.