4－7　センターの当面の設置場所

センターの当面の設置場所としては、水資源省かんがい局所管のビルが準備予定されており、これは表－5、図－4に示すとおりである。

表－5　センターの当面の設置場所

使　用　目　的	場　　所	写真番号
スタッフ執務室・情報収集室	水資源省かんがい局別館（2、3階の8部屋）（図－6）	18～20
講　義　室	水資源省かんがい局本館会議室	21～23
技術開発室（資材置場を含む）	水資源省かんがい局本館敷地内空き地（図－6）	24～26

スタッフ執務室・情報収集室に用いる予定の水資源省かんがい局別館は、配電、内装等の多少の補修が必要である。講義室として用いる予定の水資源省かんがい局本館会議室は、補修の必要はないが、黒板・視聴覚機材等の設置を要する。技術開発室として使用予定の水資源省かんがい局本館敷地内空き地は十分なスペースがある（約10×40m）。

4－8　屋外実験場の候補地

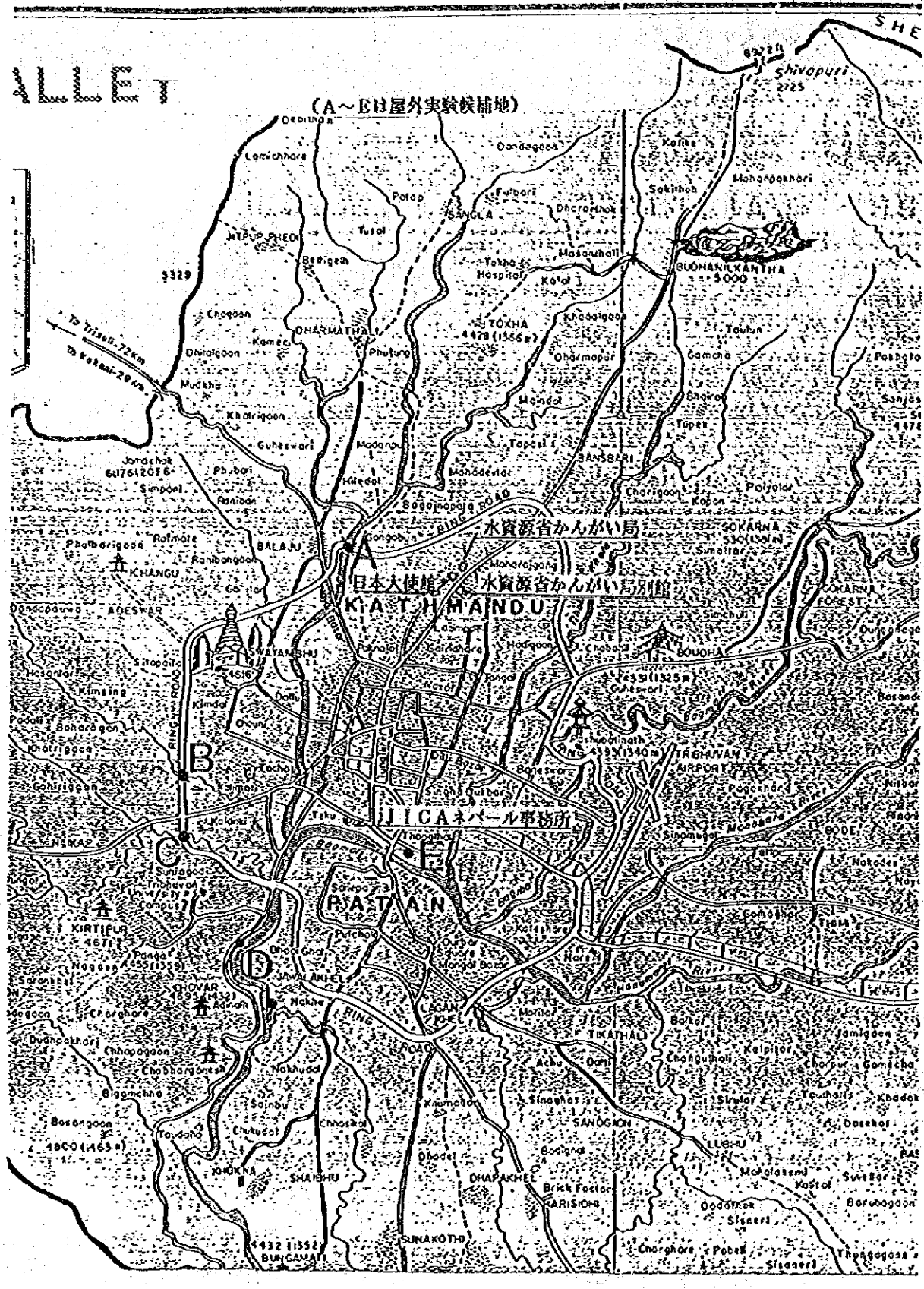
屋外実験場の候補地としては、カトマンズ市内のバグマティ川流域5カ所を調査したところ、第1候補地としては都心部に近く交通の至便なE点またはD点が現在のところ望ましい（図－4、写真27～36）。今後用地の確保、水理条件等について詳細に調査する必要がある。

4－9　現地実習の候補地

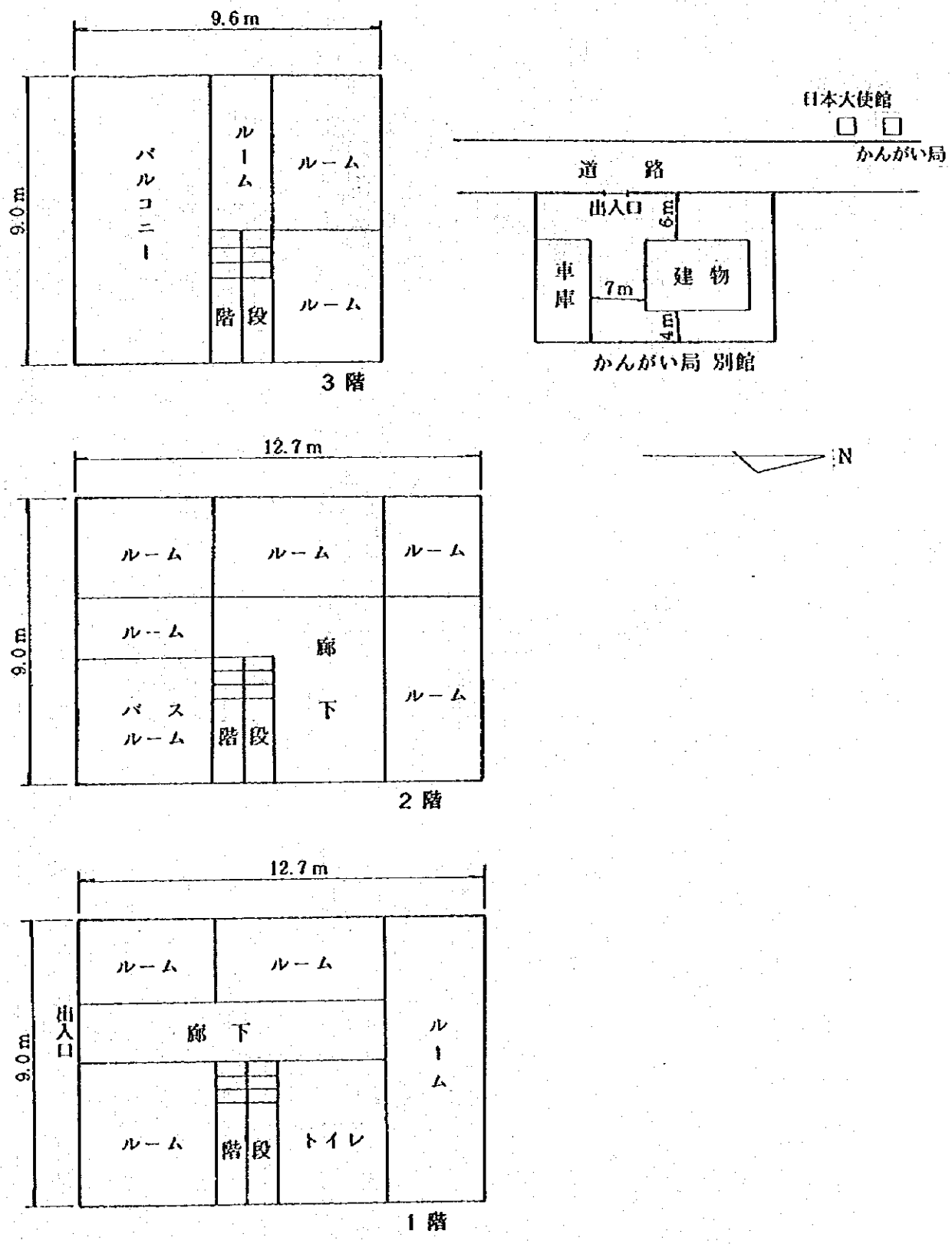
水資源省かんがい局及び森林省土壌保全・流域管理局の推薦する現地実習の候補地は図－7のとおりである。

また本調査団の調査によれば、ポカラ近郊、カトマンズ近郊が現地実習の候補地として現在のところ望ましい（図－8、写真37～41）。今後、用地の確保、専門家・研修員の宿泊地、交通手段、労働力の確保等の観点から、具体的な現地実習地を選定する必要がある。

図－4　カトマンズ市内平面図



図－5　水資源省かんがい局別館平面図

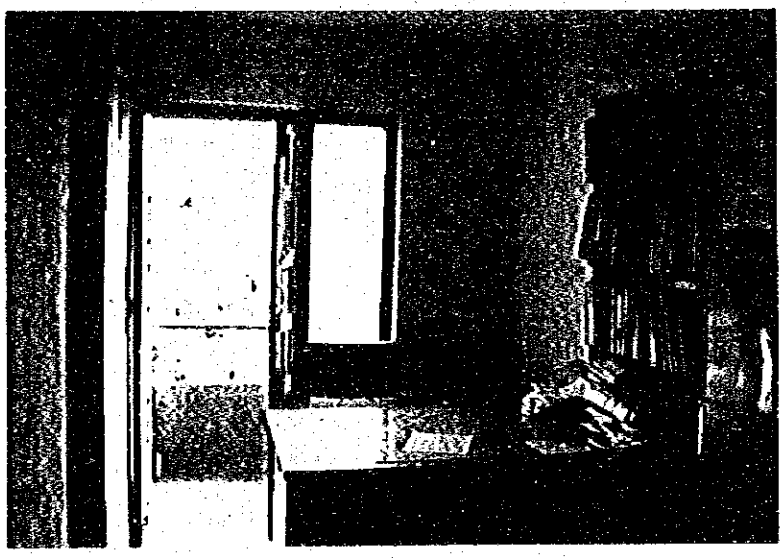


写真－18

水資源省かんがい局
別　館

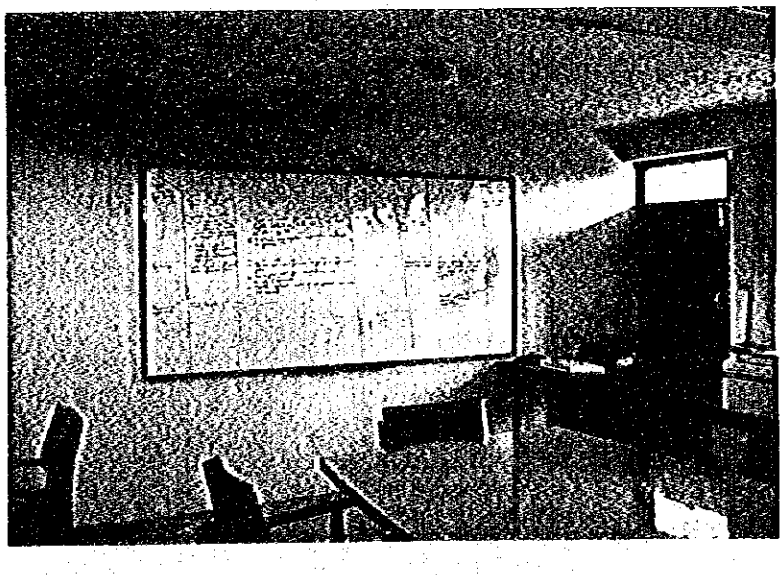
写真－19

同　上　　会議室



写真－20

同　上

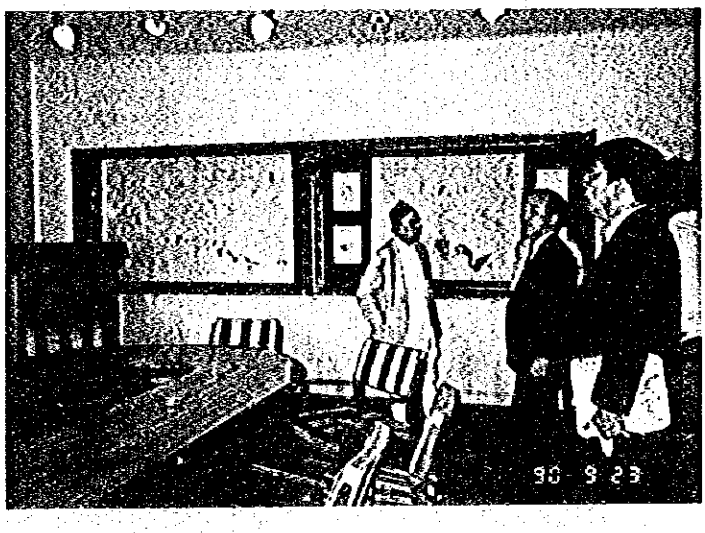


写真－21

水資源省かんがい局

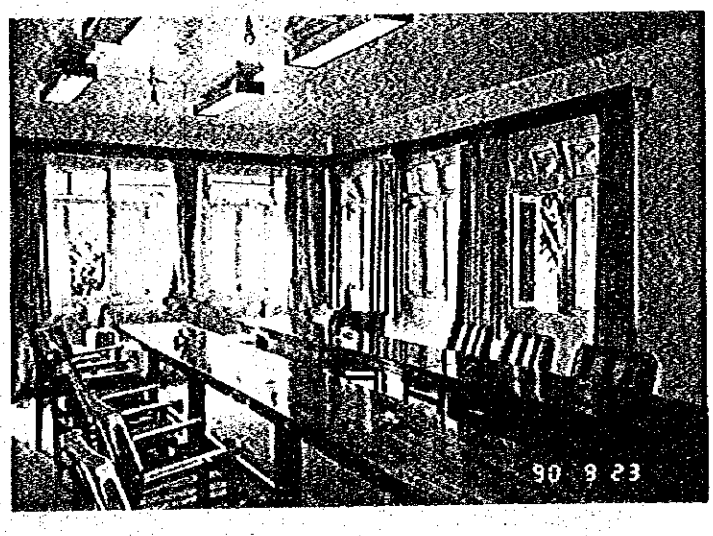
写真－22

同　上　　会議室



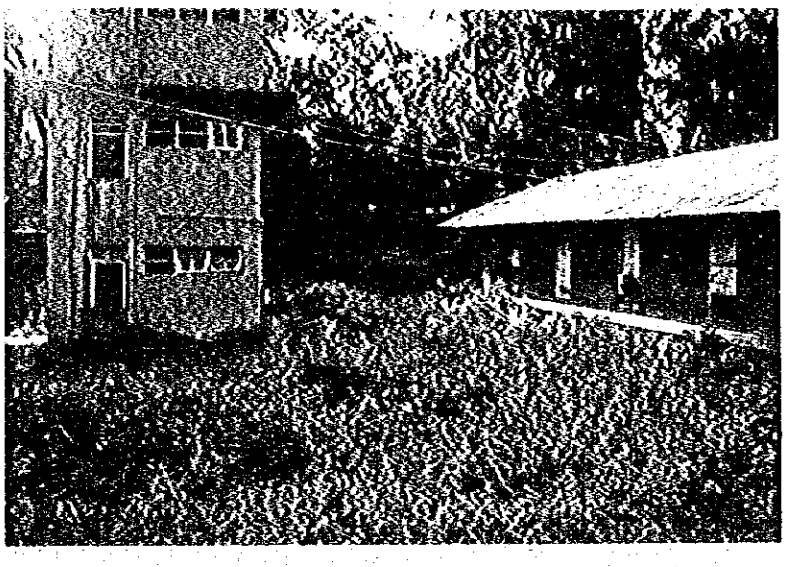
写真－23

同　上　　会議室



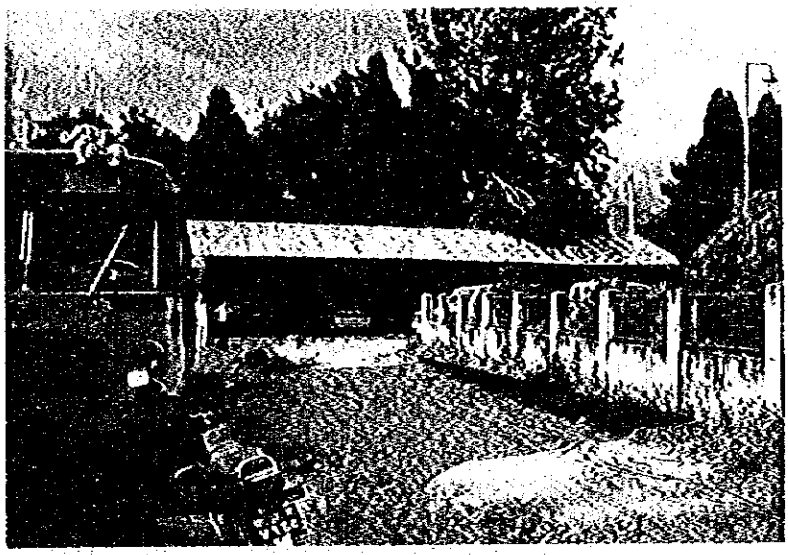
写真－24

水資源省かんがい局
空　地（技術開発室用）



写真－25

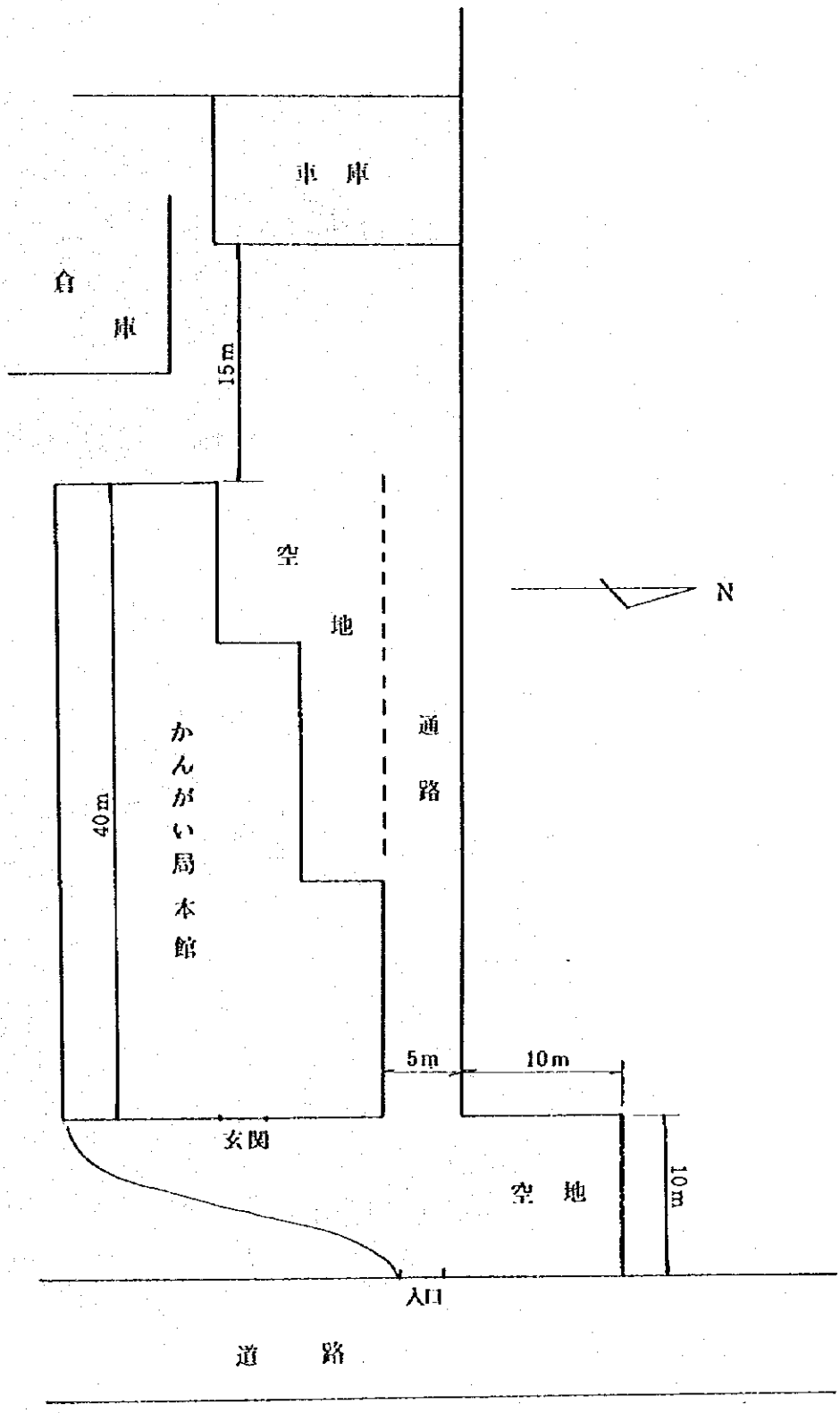
同　上



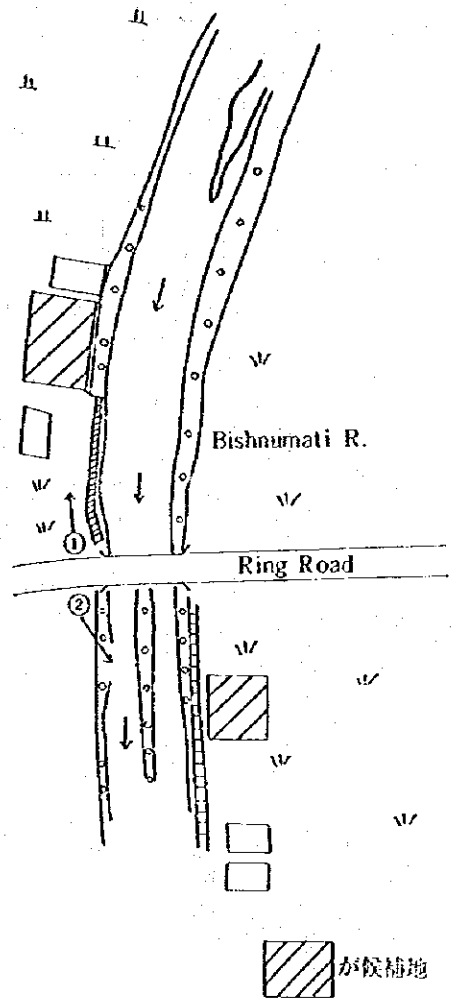
写真－26

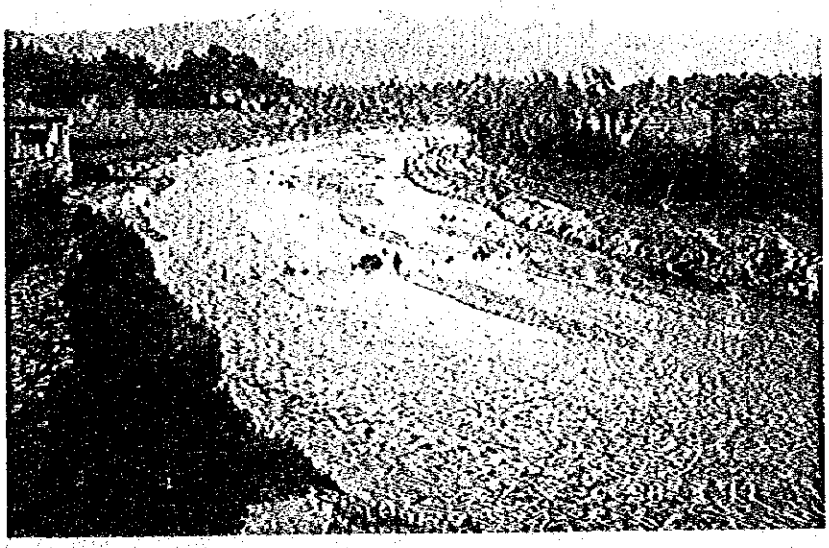
同　上

図－6　水資源省かんがい局本館



写真－27　①

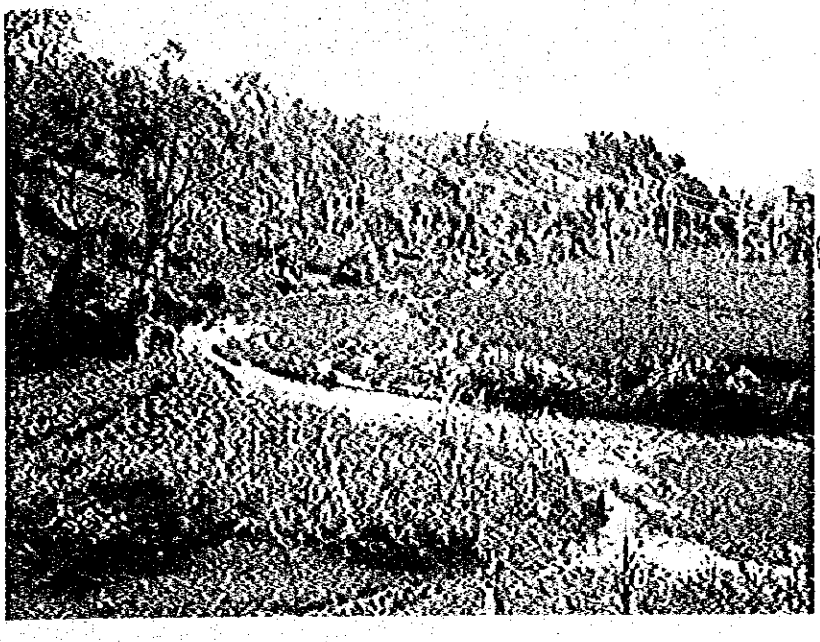


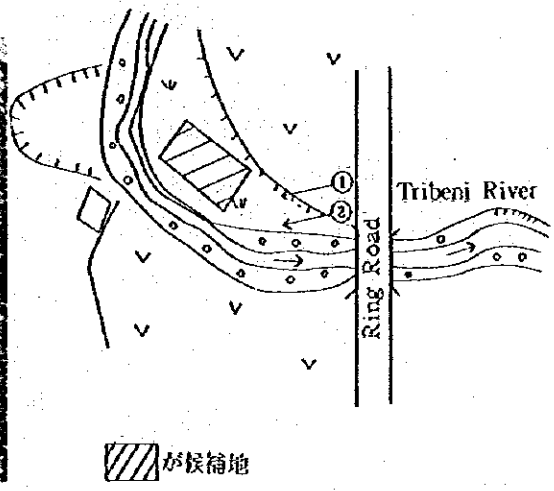


写真－28　②

屋外実験場設置予定箇所

Λ　ビシュヌマティ川（Bishnumati River）





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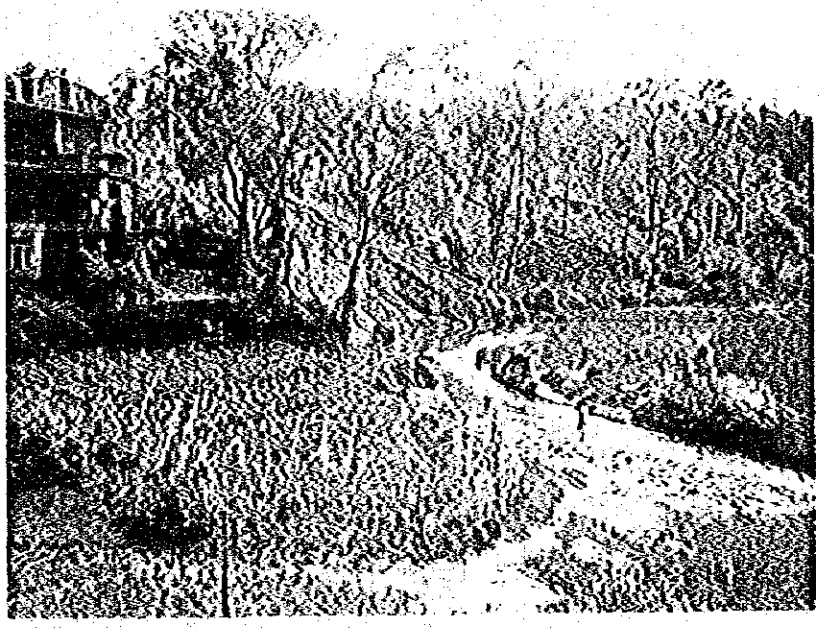
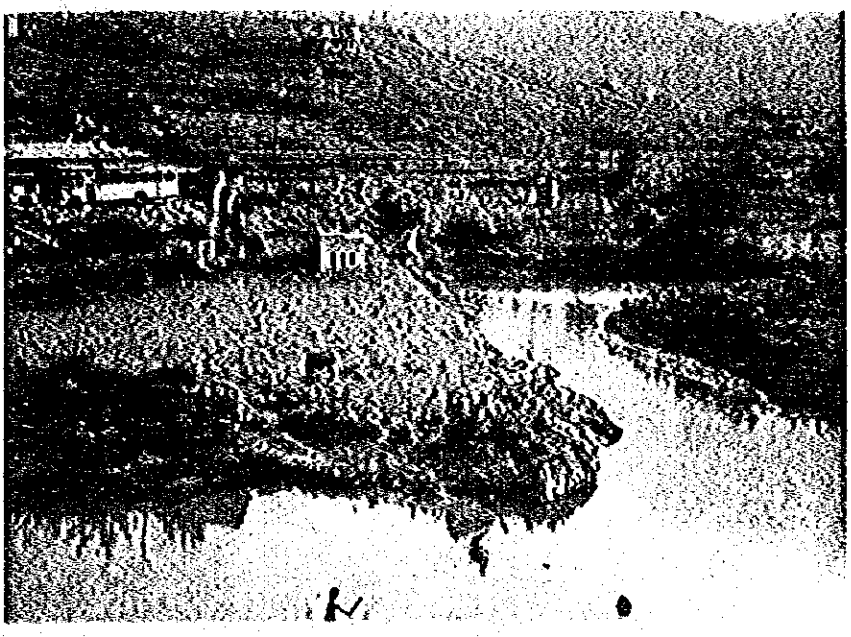
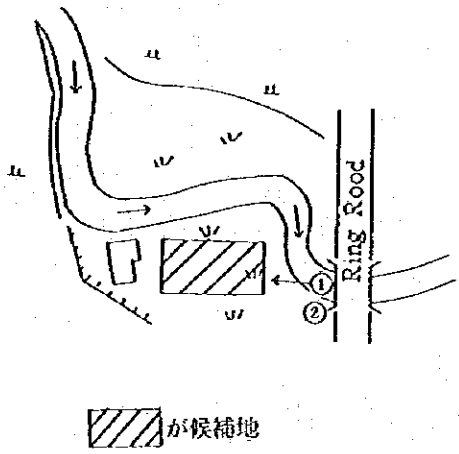


写真－30　　②

B　トリベニ川（Tribeni River）





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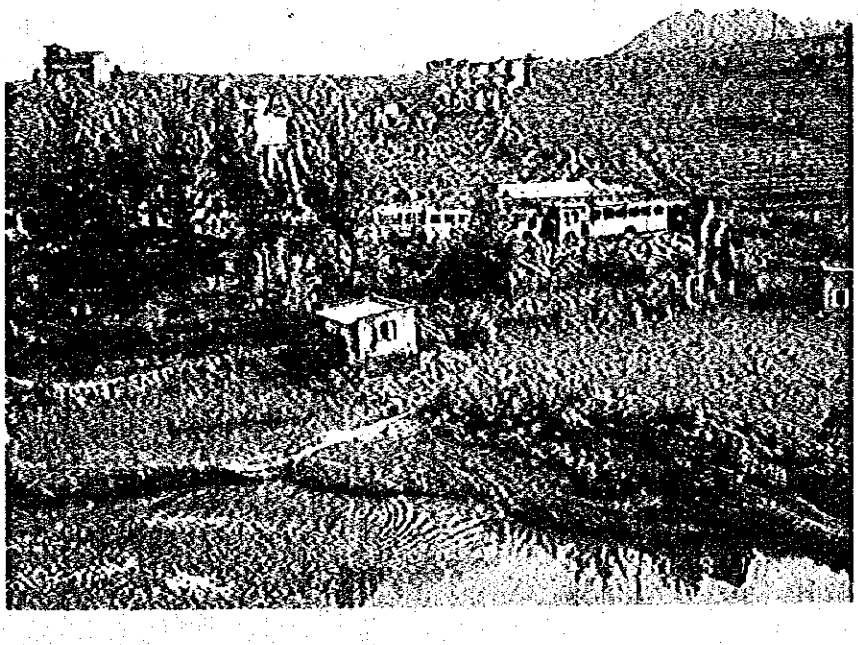
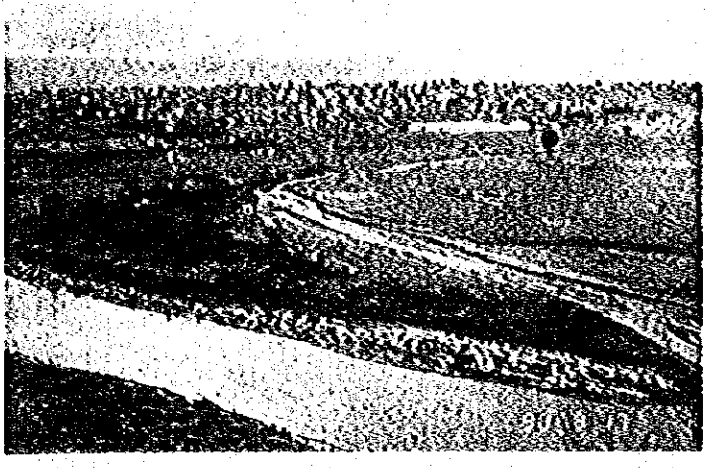


写真－32　　②

C　バルク川（Balkhu River）

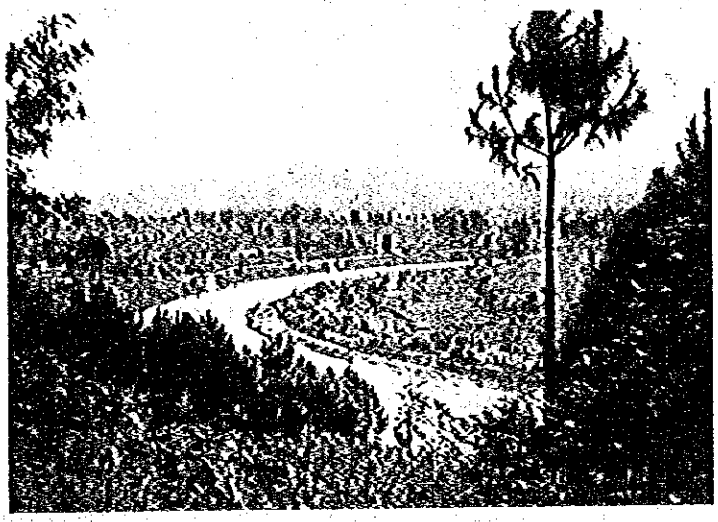
写真－33

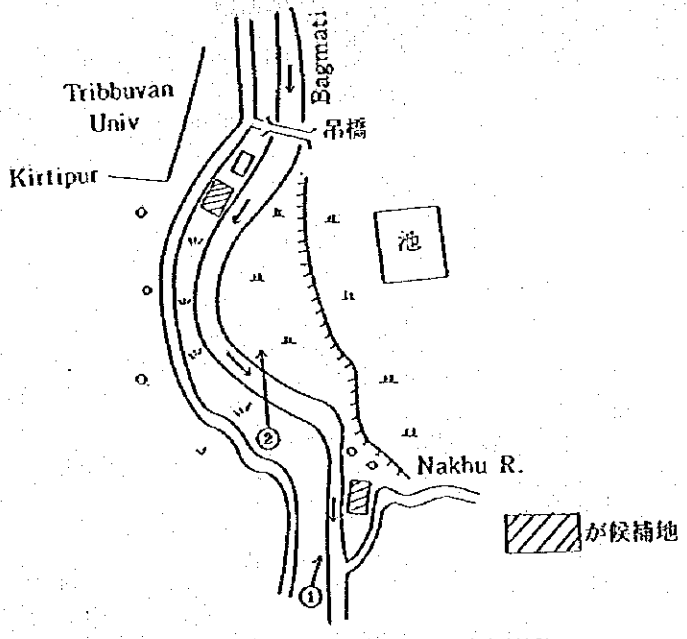
①



写真－34

②

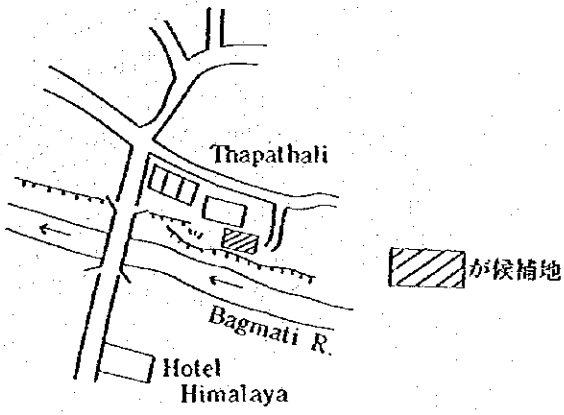




D　バグマティ川（ナク川：Nakhu River 合流点付近）
トリブバン大学に近い河畔平地とナク川との合流点
付近

写真－35

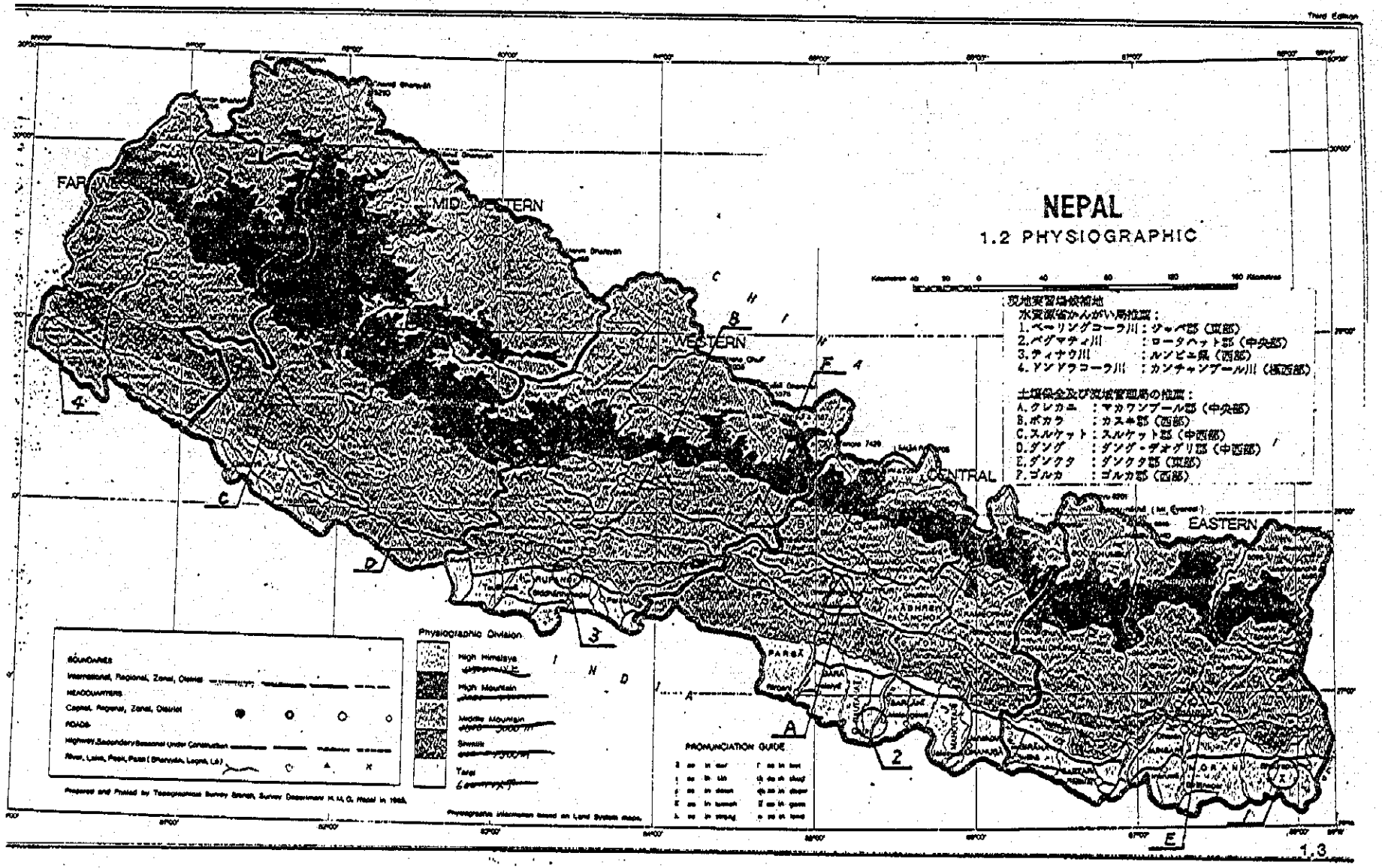
写真－36



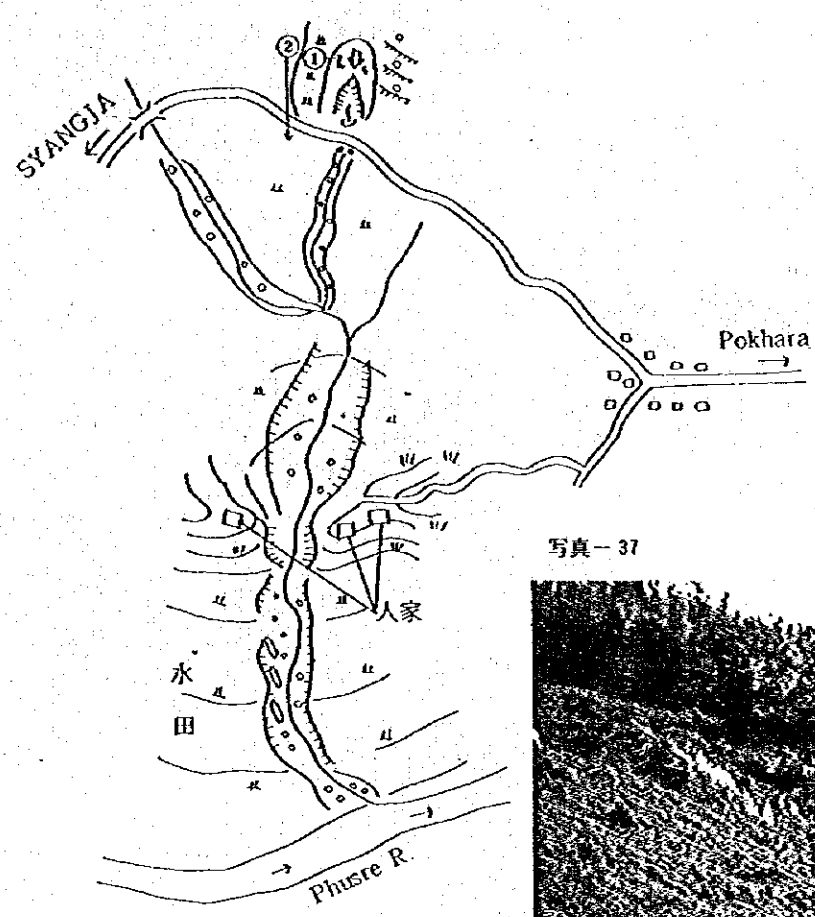
E　バグマティ川（タパリ：Thapathali付近）

交通至便、流量豊富だが揚水ポンプが必要

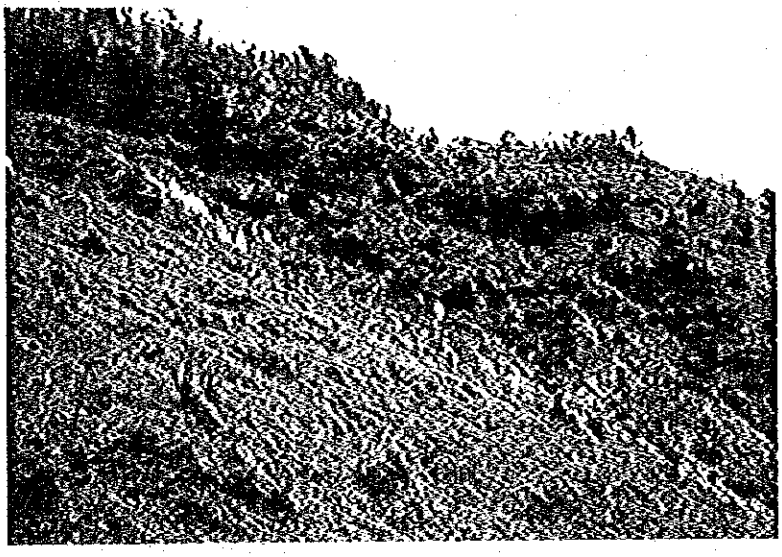
図－７　ネパール政府の提案する現地実習候補地



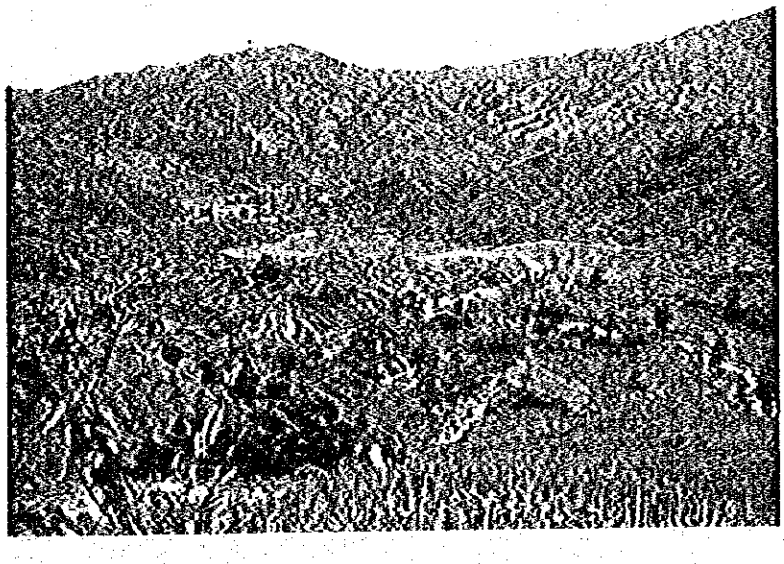
図－8　ポカラ近郊の地すべり・道路法面崩壊・
土砂流出状況図（現地実習候補地）



写真－37

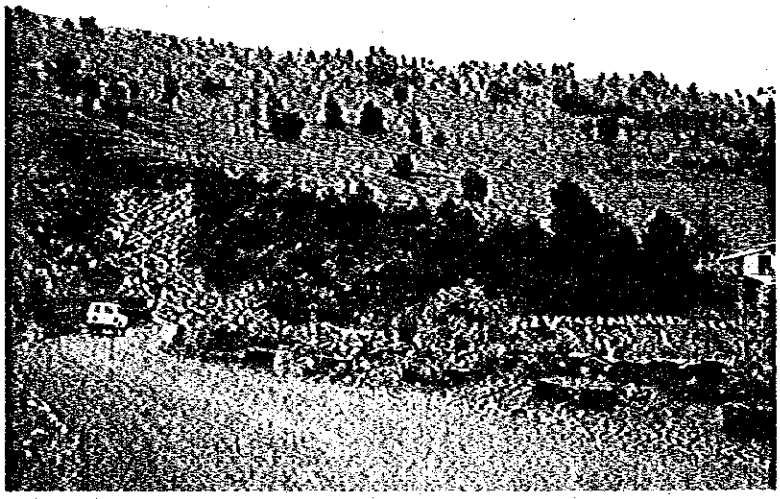


写真－38



写真－39

カトマンズ近郊の
現地実習候補地



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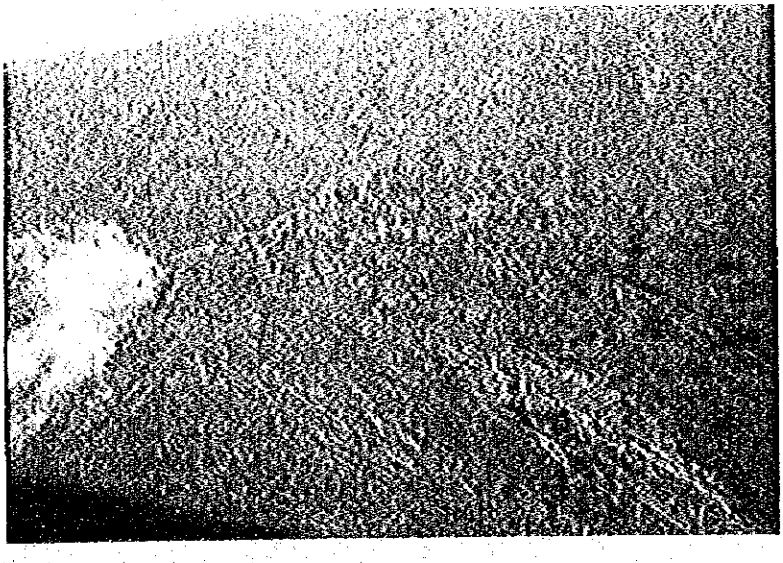
同　上

写真－41

同　上



5. 今後の取り組み方

今回調査団の調査を踏まえ、今後、以下の項目について更に詳細な検討が必要である。

① センターにおける研修対象者・研修内容の詳細な検討、教材の作成準備

② 日本でのカウンターパート研修の受入れ計画

③ 長期及び短期専門家の人数・派遣期間・派遣時期の検討

④ JICAによって供与される研修用機材のリスト

⑤ 屋外実験場、現地実習場の具体的な決定と設計・積算

⑥ プロジェクトにおける建物及び他の施設の無償資金協力の可能性

⑦ ネパール政府の関係各省局長クラスが日本の治水・砂防事業の実態を視察する。

附　　属　　資　　料

1. Report on Disaster Prevention in the Kingdom of Nepal, May 1977, JICA (抜粋)
2. Report on Soil & Water Conservation Project in Nepal, Feb. 1979, JICA (抜粋)
3. Technical Assistance Proposal for Establishment of Water Induced Disaster Prevention Technical Centre, Feb. 12, 1990
4. Answer to the questionnaire on the technical assistance proposal for establishment of WIDP Technical Centre
5. Minutes of Meeting
6. カレンダー
7. 参考資料一覧

REPORT
ON
DISASTER PREVENTION
IN
THE KINGDOM OF NEPAL

May 1977

JAPAN INTERNATIONAL COOPERATION AGENCY

I. Introduction and Summary of Recommendations

1. Introduction

1) The United Nations Office of Disaster Relief Coordinator (UNDRO) requested the Government of Japan to send a six month mission to assist His Majesty's Government of Nepal in establishing policies in the area of desaster prevention.

2) In response to the request made by UNDRO, the Government of Japan sent a preliminary survey mission prior to the six month mission to study the overall situation concerning disaster prevention and preparedness in the Kingdom of Nepal.

3) The preliminary survey mission consists of two experts, Mr. H. Tamamitsu, Chief of the Technical Staff, Planning Division, Mr. T. Matsushita, Assistant Director, Sand Control Division, River Bureau, Ministry of Construction, Japanese Government.

4) The preliminary survey mission stayed in the Kingdom of Nepal from April 8 to April 20, 1977. Through the arrangement made by the UNDP office (Mr. B. Hausner, Assistant Resident Representative in charge), the team visited relevant Departments of H.M. Government and held discussions on disaster prevention.

5) During the mission's stay, the mission made a 1500 Km field trip by vehicle to observe the sites of landslides and floods in Hills, Terai, Inner Terai Area.

3. Summary of Recommendations

1) The mission obtained fruitful results with the kind cooperation of His Majesty's Government of Nepal and the UNDP office, in spite of a short term survey, in appraising the existing situation of natural disaster from which the Kingdom of Nepal has suffered for a long time. The mission was able to get useful information for study of the direction of future technical cooperation with Nepal concerning natural disaster prevention.

2) It is an urgent matter for the Kingdom of Nepal to tackle the establishment of policies, systems and measures for prevention of natural disasters caused by floods and landslides including collapse of mountain slope and debris-flow.
The mission, therefore, felt strongly that a long term mission of disaster prevention to study the situation in more detail and to give proper advice to the concerned Departments of H.M's Government is definitely necessary.

3) As to the long term mission, it is recommended that, at first, one(1) expert who is a hydrologist and at the same time a river control and sand control (erosion and debris-flow control) engineer be sent to H.M's Government of Nepal. He should also have a knowledge of geology and experience in administrative matters involved in disaster prevention.

Because of the importance of the experts duties, it is recommended that the expert continue his duty for at least one(1) year.
The expert will study and collect necessary information and give advice concerning policies, systems and technical measures for disaster prevention.

4) Some additional experts or project survey missions might be necessary according to the expert's study and activities. However, these judgements will be the responsibility of the expert.

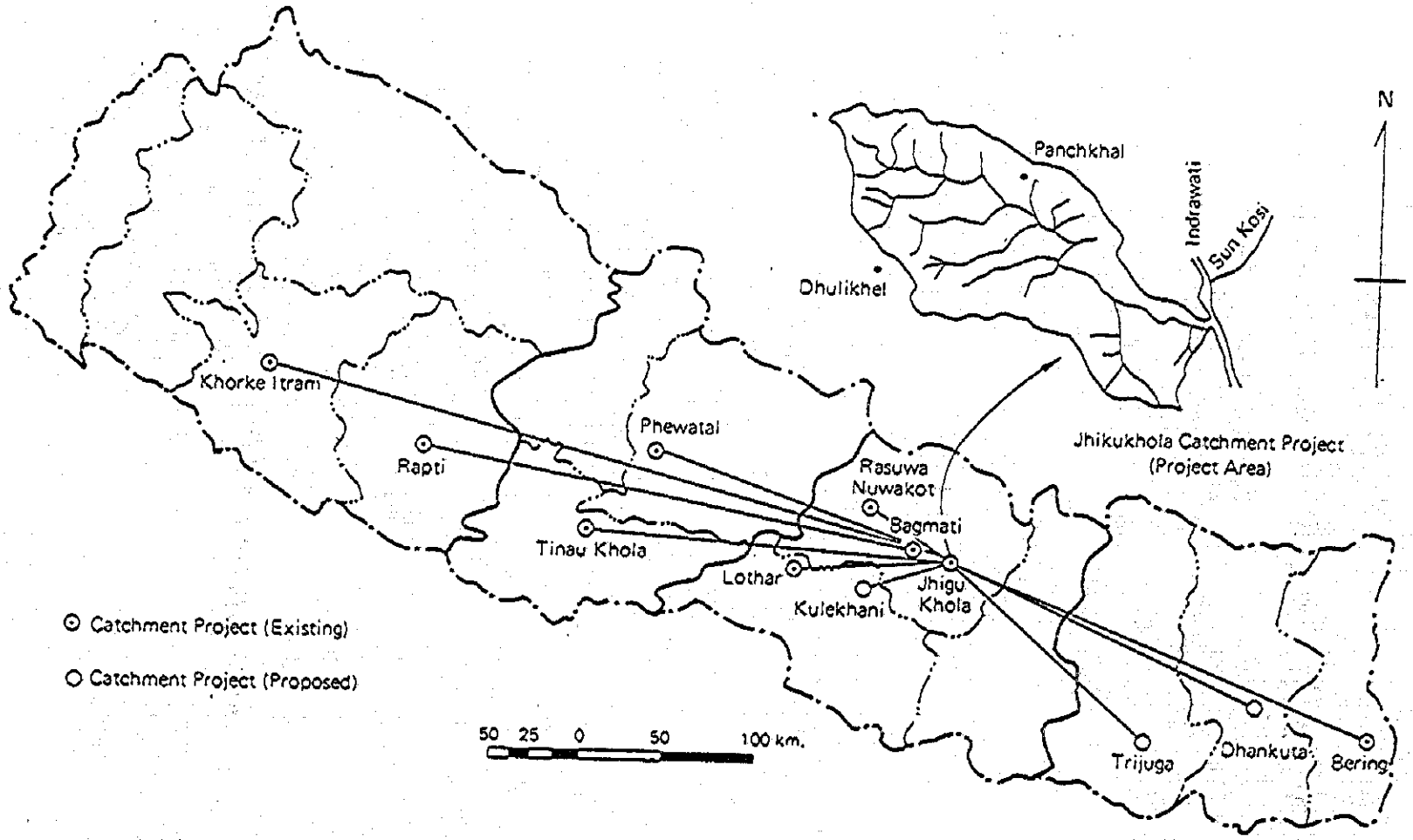
5) The expert is expected to implement his assignment actively and effectively as a UN expert cooperating with his counterparts of the Ministry of Home and Panchayat.
The expert's activities should be closely connected with the activities of the Central Disaster Relief Committee under the Chairmanship of the Minister of Home and Panchayat.

REPORT ON
SOIL AND WATER CONSERVATION PROJECT
IN NEPAL

February, 1979

JAPAN INTERNATIONAL COOPERATION AGENCY

Map of Nepal Showing Different Project Areas of DSWC



I.W.M. Cartographic Section

By:– Devendra Tiwari

ACKNOWLEDGEMENT

The following persons took charge of the principal part of preparation of the Report on Soil and Water Conservation Project in Nepal. The elaborate data contained in this report about the Kabhre administrative district were made available from the chief district officer, officials of other government institutions and people of each Panchayat. We are grateful to all the people who extended their cooperation in materializing this report.

Planning		
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Planning officer	Mr. K.B. Malla	" " "
Soil scientist	Mr. S. Bhattarai	" " "
Report editing		
Soil scientist	Mr. S. Bhattarai	" " "
Colombo plan expert	Mr. A. Hashimoto	JICA
Field research		
Soil scientist	Mr. S. Bhattarai	D.S.W.C., Ministry of Forest, H.M.G.
Overseer	Mr. D.P. Tiwari	" " "
Colombo plan expert	Mr. A. Hashimoto	JICA
Assistant for Colombo plan expert	Mr. S. Bhattachan	"
Map drawing		
Overseer	Mr. D.P. Tiwari	D.S.W.C., Ministry of Forest, H.M.G.
Cartography section staffs of I.W.M.		" " "
Soil analysis		
Soil analyst	Miss B.D. Maharjan	D.S.W.C., Ministry of Forest, H.M.G.
Technical advise and suggestion		
	Other staffs of D.S.W.C.	" "
Report typing		
Typist	Mr. K. Gopal	

February, 1979

Akira Hashimoto

Colombo Plan Expert
dispatched by JICA to Nepal
from Sept. 1977 to Oct. 1978

BASIC NEEDS OF THE PROJECTS

It has been felt world-wide that natural resources are no longer plentiful and that improved management of these resources is the need of the day.

Nepal is a country with diverse topography and climates – from tropical to alpine. There is, therefore, a corresponding diversity of vegetation in the Terai, hills and mountainous regions. The population has increased greatly in the last 2 to 3 decaded (11.6 mill in 1971 census) without adequate job opportunities for the socio-economic development of the country and the people.

Nearly 93 % of the population depend upon agriculture. Natural calamities such as soil erosion, landslides and floods have adversely affected the agricultural production of the country, in addition to the lack of other necessities. The result of increasing incidences of soil erosion, landslides and floods in the country have compelled the people in the hills to migrate in the Terai Region encroaching on new forest lands for cultivation.

– The loss of top soil in the mountains raises the bed level of rivers in the plains by 15 to 30 cm every year,

– The World Bank estimates that 240 mill cubic meters of soil is transported by Nepal's major rivers every year, and

– Mr. M.E. Stevens & Mr. M.D. Joshi estimate that 10,000 sq.km of land is devoid of sufficient vegetation and can be considered as exhibiting the desertification process (Desertification in Nepal for U.N. Conference on Desertification, Delhi, India, April, 1977 pp. 9) are alarming features. Measures must be taken to determine the best technique and methodology to combat the deteriorating mountain environment in Nepal.

The establishment of the Department of Soil and Water Conservation in August, 1974 has shown the timely action taken by His Majesty's Government. Since its establishment, the Department is concentrating its activities in some project areas only. The need has already been felt for expanding its activities in wider portions of Nepal, during the sixth five-year plan period. Hence the necessity of establishing a project combining Research, Demonstration and Education has therefore been realized

– to determine the necessary scientific techniques and methodologies suitable for the extension of soil and water conservation activities all over the country.

– to educate the people by proper techniques and methods (soil and water conservation) so as to obtain their full participation and support in conservation activities.

The objective of Soil and Water Conservation Research discribed in the soil and water conservation system 1977 (Program planning and Budgetting for 25 years, HMG Department of Soil and Water Conservation) is presented as "Research provides information and a basis to apply sound practice to applied conservation practices." Most studies are not thorough enough and long-term investigations must be undertaken.

INTRODUCTION:

The report has been divided into three main chapters: RESEARCH, DEMONSTRATION and EDUCATION. The planning and budgeting has been estimated for 10 years. The report has been prepared on the basis of available local information, along with aerial photos (1 : 20,000) taken in 1967 and 1972 and 1 : 1 mile topo maps (1956). Assessment of the conservation work has been made by the comparison of aerial photographs and recent field observations.

The project area at Jhiku Khola catchment represents a part of the typical midlands of Nepal, and has been selected as a research center for the following reasons:

- Accessible – The project area is approachable by a one-hour drive by car (about 50 km) from Kathmandu.
- Representative – The project area is representative of the majority of the country.
- Public participation – There is a possibility of more public participation in conservation work.
- Improvement – There is a good natural potential for improvement.
- Supervision – The project area can be easily supervised from the department in Kathmandu.
- Labor – Labor is plentiful in the catchment area.
- Working materials available:
- Aerial photographs and maps of the area available.

The other project areas as shown in the map feed the data required for the research work.

The project will be directly implemented by DSWC (Department of Soil and Water Conservation)

A number of Nepalese institutions will be involved including Tribhuvan University for conservation education and research work. Some of the international agencies working in Nepal will be encouraged to co-ordinate their activities with those of the project, and to assist in the research work. A major share of the technical and financial assistance is desired from a donation country besides the HMG's input.

附属資料3.

TECHNICAL ASSISTANCE PROPOSAL FOR ESTABLISHMENT OF WATER INDUCED DISASTER PREVENTION TECHNICAL CENTRE

1. Background

The Kingdom of Nepal, consisting of a steep terrain and located in the area which is subject to heavy rains, frequently suffers from various types of hazard and disaster caused by the action of water such as sedimentation, landslide, slope failure, flood, bank erosion, glacial lake outburst etc. These phenomena induce severe hazards in implementation, operation and maintenance of water resources development projects and other public works; besides direct impact to the people by destroying their environment for living and production, thereby causing serious disadvantage in economic and social development of the nation.

To cope with the above situation, though elimination of such disasters may not be possible from the technical and economical point of view, it is of practical importance to reduce the occurrence of such disasters, to mitigate the sequential damages, and to adopt efficient measures for rehabilitation. Further it is desirable that these activities be carried out by the Nepalese engineers and technicians using the most appropriate method that may have to be developed through combination of the indigenous method and modern technology.

In view of the above it is considered very appropriate and effective to establish an institute which may undertake research works for development of appropriate engineering method to cope with the water-induced disasters and carry out training of the engineers and technicians to be engaged in the disaster prevention and rehabilitation works.

Considering the similarity in the topography and hydrologic condition to Nepal and accumulated experience in "Sabo" works, flood and debris control, slope protection and disaster rehabilitation in Japan, technical cooperation of Japanese Government in establishing and operating the proposed centre is requested.

2. Objectives

- Training of professional and technicians in the field of water-induced disaster prevention

- Development of engineering method appropriate to local conditions in Nepal

- Preparation of technical standard for water-induced disaster prevention works

- Application of the developed engineering methods and promotion of their wide use.

3. Scope of Activities

Activities of the Centre will include the following :

(1) Training in Nepal

Training will be conducted through lecture, exercise and on the job training in order to provide Nepalese professionals and technicians with knowledge and skills required for survey, planning and design.

(2) Training in Japan

A group of professionals and Technicians (about ten persons) will be dispatched to Japan for a certain period (3 to 4 months) every year for training on specific theme in relation to water-induced disaster prevention works.

(3) Development of Engineering Method

Engineering methods appropriate to local conditions of Nepal will be developed through combination of indigenous method and modern technology. Preparation of technical standard and advice on on-going projects at various sites will also be important activities under this component.

4. Composition of Training Course

Training course will be composed of :

(1) General Course : Outline, objectives and effects of countermeasures for water-induced disaster will be introduced in this course widely for professionals and technicians concerned in the government and private sectors.

(2) Advanced Course : This course aims at providing training for senior officials of the government who will play a leading role in their respective field in the future.

(3) Intensive Course : This course aims at providing training of core engineers with emphasis on practical exercise with regard to F/S of water-induced disaster prevention project and D/D/ of relevant structures.

5. Contents of Development of Engineering Method

The development of engineering method will focus on :

(1) Development of engineering method appropriate to local conditions, in the field of civil works, vegetation, land use regulation, etc. though implementation of pilot projects.

(2) Technical advice on projects executed at various sites in Nepal.

(3) Investigation, test and examination required for preparation of the technical standard.

6. Location of the Centre

- The Centre will be located in Kathmandu.

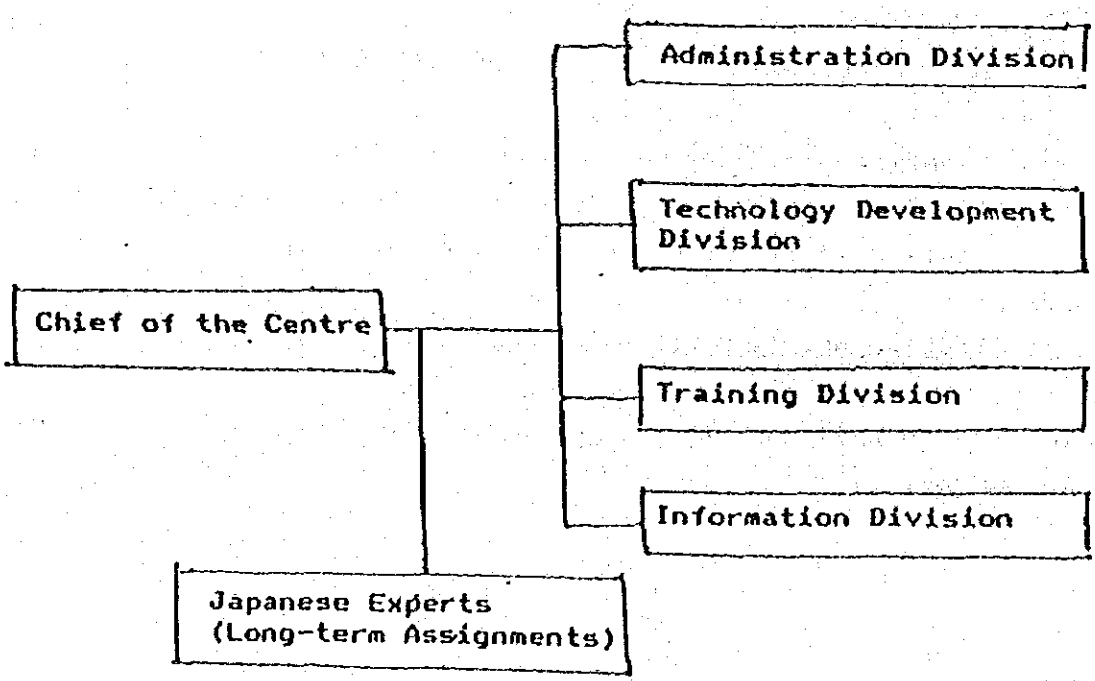
- An office for the on the job training will be provided at a project site selected in the country. (Japanese staff will be in the office when necessary).

7. Organization and Operation of the Centre

The Centre will be directly under the Minister of Water Resources.

Project Development Board will be established to provide policy guidelines and to overview the activities of the Centre.

The composition of the Committee will be :
Chairman : Secretary, Ministry of Water Resources
Members :
Executive Secretary, Water and Energy Commission
Director General, Department of Irrigation
Director General, Department of Hydrology and Meteorology
Director General, Department of Soil Conservation and Watershed Management
Managing Director, Nepal Electricity Authority
Chief Engineer, Department of Roads
Chief Project Coordinator, Ministry of Water Resources - Member Secretary
Project Manager, Water Induced Disaster Prevention Technical Centre
The organization of the Centre is shown below :



8. Equipment to be Furnished

Main equipment to be furnished includes :

- Hydrological observation equipment,
- Topographic survey equipment,
- Test apparatus,
- Vehicles,
- Construction equipment,
- Audio visual aids for training,
- Computers,
- Office equipment, etc.

9. Undertakings

(1) Undertakings of the Japanese Government

Undertakings of the Japanese Government are as follows:

- Despatch of experts (Long-term assignment basis):
  Seven experts including a coordinator will be despatched during the whole period of technical cooperation by the Government of Japan.

- Despatch of experts (Short-term assignment basis):
  Experts to be required additionally for the fields which are difficult to be covered by the above long-term basis experts will be despatched in accordance with the necessity on the short-term assignment basis.

- Overseas training:
  About ten professionals and technicians per year will be trained in Japan.

- Facilities:
  Some facilities including buildings will be furnished on the grant basis.

- Expenditures to be required in relation to the above-mentioned items including the equipment to be furnished will be borne by the Japanese Government.

(2) Undertakings of His Majesty's Government (HMG) Nepal.

- Facilities to Japanese experts:
  The same treatment and services as other JICA experts will be given to the experts.

- Land and facilities:
  Land, furniture necessary for operation of the Centre except for those furnished on the grant basis, and consumable, etc. will be provided by the Nepalese Government.

- Staff:
  Counterparts and staff in the Centre will be provided in necessary number.

- ~~Local~~:
  Local Expenditure required for the activities of the Centre will be borne by HMG/Nepal Government.

- Preparation of budget:
  The Nepalese Government will make arrangement for acquiring the necessary budget for the expenditures as mentioned.

10. Period of Technical Cooperation

The period of the technical cooperation by the Government of Japan will be 5 years agreed at the time of signature on R/D. Various cooperations as mentioned above will be provided during the period.

附属資料4.

Answers to the questionnaire on the technical assistance proposal for establishment of WIDP Technical Center.

1.1 Topography

The great elevation change from the Himalayas in the North to the plains in the South over a short width of 150 to 230 Km exhibits three distinct topographical regions. These are the following:

Mountain Zone: 34% of the total land area,
Hill Zone: 43% of the total land area, and
Terai Zone: 23% of total land area.

Climate

Nepal has three distinct seasons- (i) cold season from October to February, (ii) hot and dry season from March to Mid June and (iii) rainy season from mid-June to end of September. There are five distinct climate belts:

- Tundra-like climate above the snowline in the reaches of the high Himalays.
- Alpine climate in the high mountain regions with low temperatures in summer and harsh frosty conditions in winter.
- Cool temperature climate in the Mahabharat lekh with mild summer and cool winter.
- Warm temperature climate in the mid-hills with warm and wet summer and dry winters.
- Hot and humid climate in the terai with humid monsoon and mild winter.

Summer rainfall in the country is caused by south-west monsoon and is responsible for the water induced disaster. Average precipitation over the year is around 1400 mm. Because of concentrated rainfall during monsoon, about 72% of total runoff is washed off as instantaneous flow. The total runoff from Nepal is estimated at about 200 million cubic meters per annum.

Water induced disaster

Some of the major and frequent water induced disasters are mass wasting, flooding, heavy storms and desertification.

1.2.1 General education system.

- School Leaving Certificate is awarded upon completion of 10 years of schooling at the primary, secondary and higher secondary level.
- 6 years of college education at the following levels:
  2 years of intermediate level college education,
  2 years of bachelor level education upon which Bachelor degree is awarded, and
  2 years of masters level education for Masters degree.

For engineering four years of studies are required beyond intermediate level college education.

1.2.2 High school and university that has a course in flood control, sabo engineering, forestry, etc.:

Institute of Engineering: Offers upto bachelor level course in civil engineering. About 25 students graduate each year.

Institute of Forestry: Offers upto bachelor level course in forestry. About 40 students graduate each year.

Institute of Agriculture and Animal Science: Offers upto bachelor level course. About 100 students graduate each year.

1.2.3 Curriculum

Civil Engineering: subjects include

- irrigation and river training
- hydrology
- soil mechanics
- design of R.C.C. structures
- transportation etc

Forestry: subjects include

- soil conservation and watershed management
- hydrology, irrigation and drainage
- soil fertility, soil genesis
- silviculture
- forest protection, etc

Agriculture: subjects include

- soil fertility and plant nutrients
- soil microbiology
- soil and water conservation
- farm structure and layout, etc

1.2.4 Employment of graduates

There are at present about 5000 engineers in Nepal. According to a recent estimate about 100 engineers are unemployed. Engineers are working primarily in the following ministries:

- Ministry of Water Resources
- Ministry of Transport
- Ministry of Housing and Physical Planning

The forestry and agriculture graduates are employed in their respective principal ministries - viz, Ministry of Forest and Soil Conservation and Ministry of Agriculture.

3.1.1 Number of engineers at each ministry:

Ministry of Water Resources: about 1000
Ministry of Transport: 600
Ministry of Housing and Physical Planning: 400

Forestry: about 400 foresters

3.1.2 Number of engineers working for water induced disaster prevention work:

Ministry of Water Resources	
Department of Irrigation:	about 50 civil engineers
Ministry of Forest and Soil Conservation	
Department of Soil Conservation and Watershed Management:	9 civil engineers 3 agri. engineer 40 forest engineers (foresters)

3.2.1 Annual finance in water induced disaster prevention works:

Ministry of Water Resources
Dept. of Irrigation:
(River training works)

FY 1990/91	Rs. 24 million
1989/90	Rs. 52 million
1988/89	Rs. 14 million

Ministry of Forest & Soil Conser.
Dept. Soil Conser. & W.M:
(protection of physical infrastructure, watershed management projects, etc):

FY 1989/90	Rs. 37 million
1988/89	Rs. 32 million
1987/88	Rs. 36 million (note: total budget of the department)

4.1 Selection of trainees:

Trainees will be nominated by the concerned departments from within the organization.

4.2 Academic background of the trainees:

Engineers, foresters, graduate scientists etc.

6.1 Temporary location of the center:

Department of Irrigation

6.2 Field sites:

Recommended by WECS:

Bearing Khola, Jhapa
Bagmati, Rautahat
Tinau, Lumbini
Dondra Khola, Kanchanpur

Recommended by Dept. of Soil Conservation & Watershed Management.

Kulekhani
Pokhara
Surkhet
Dang
Dhankuta
Gorkha

附属資料5.

MINUTES OF MEETING
ON
THE PRELIMINARY SURVEY
OF
THE WATER INDUCED DISASTER PREVENTION TECHNICAL CENTRE
IN
THE KINGDOM OF NEPAL

In response to the proposal of His Majesty's Government of Nepal, the Government of Japan sent the JICA Preliminary Survey Team from September 15 to 27, 1990 of which the itinerary is attached in another sheet.

Ministry of Water Resources, HMG/N with the representatives of other concerned ministries of HMG/N (hereinafter referred to as HMG/N Team) and the JICA Preliminary Survey Team (hereinafter referred to as JICA Team) discussed on establishment of the centre based on the technical assistance proposal by HMG/N for establishment of the Water Induced Disaster Prevention Technical Centre dated February 12, 1990.

1. JICA Team examined the background, the objective, the scope of works, etc. of the project proposed by HMG/N, submitted a questionaire attached in Appendix-A and explained it. HMG/N furnished information as mentioned in the questionaire.

2. HMG/N and JICA Teams agreed to render the best efforts to realize the centre. (The schedule for the establishment of the centre is attached in the Appendix-B.)

3. JICA Team proposed to HMG/N a training plan as shown in the Appendix-C. Both sides agreed that each side examines the training plan and its implementation aspects.

4. It was agreed that JICA Team is to study the following by the start of the project:
   ① the number, the length of stay and the dispatch schedule of both the long term and the short term experts,
   ② the inventory of the equipment to be granted by JICA,
   ③ the plan for acceptance of Nepalese trainees to Japan, and
   ④ possible grant assistance to buildings and other facilities for the project.

5. HMG/N emphasized the need for Japanese grant assistance to buildings and other facilities needed for the smooth and effective project implementation and strongly requested JICA Team despatch of a study mission at the earliest for this grant assistance.

6. HMG/N agreed, as a temporary measure, to put the centre office in the Department of Irrigation, Ministry of Water Resources and provide the project a lecture room, a technical development room including storage space for the project equipment, an information room and office rooms for the JICA experts.

7. Both sides confirmed that it would be desirable for effective and early start of the project to have an opportunity to exchange views between HMG/N and JICA, Ministry of Water Resources, HMG/N strongly requested that another JICA preliminary survey team is despatched to Nepal by March 1991, that a Sabo expert is despatched as soon as possible and that contact of concerned officials at the higher level is maintained to share the knowledge of the Japanese water induced disaster prevention activities.

24th September 1990

Shigekiyo TABATA
Leader
Preliminary Survey Team
Japan International
Cooperation Agency

H.M.SHRESTHA
Chief Project Coordinator
Ministry of Water Resources
His Majesty's Government of
Nepal

Another sheet

The itinerary of the JICA Preliminary Survey Team

No.	Date	Activity
1	Sep. 14 Feb.	11:00 TG641 Tokyo → Bangkok
2	15 Sat.	10:55 TG311 Bangkok → Kathmandu
3	16 Sun.	Visit JICA Kathmandu Office
4	17 Mon.	Visit Embassy of Japan / Discuss with Government of Nepal
5	18 Tue.	Field trip for seeing water induced disasters and sites proposed for the field practice
6	19 Wed	
7	20 Thu.	
8	21 Fri.	
9	22 Sat.	
10	23 Sun.	
11	24 Mon.	Sighn a subject of discussion / Report to JICA Kathmandu Office
12	25 Tue.	(Only mission leader, 9:00 RA401 Kathmandu → Bangkok) Field trip for seeing Project area (Irrigation, River, Dam, etc.)
13	26 Wed	
14	27 Thu.	13:55 TG312 Kathmandu → Bangkok
15	28 Fri.	11:00 TG640 Bangkok → Tokyo

Appendix-A

Questionaire to the technical assistance proposal for establishment of water induced disaster prevention technical center in Nepal

1. About background of the project
   (1) Explain about outlines of topography, meteorology, and records of typical water induced disasters in Nepal.
   (2) Answer to the following items about educational system in Nepal.
      ① General educational system in Nepal
      ② High-school and university that has a course of flood control, sabo engineering, forestry, etc. and number of students
      ③ Curriculum for the above-mentioned studies
      ④ Employment of graduates

2. About objectives of the project
   Nothing

3. About scope of activities of the project
   (1) Answer to the following items about engineers in Nepal.
      ① Number of engineers working at each ministry
      ② Number of engineers working for water induced disaster prevention works at each ministry and local organization (classified by ministry, local organization, school career and annual employment)
      ③ Number of contractors and consultants (private enterprise)
   (2) Answer to the following items about implementation system of water induced disaster prevention works in Nepal.
      ① Annual finance in water induced disaster prevention works by each ministry in the last 5 years
      ② Site and contents of the above-mentioned works

4. About composition of training course
   (1) Explain about plan to selection of trainees by each training course (Appendix-C) and treatment of graduates from the center.
   (2) Explain about school career, employment record, belonging organization, present post, etc. of trainees.

5. About contents of developoent of engineering method
   Nothing

6. About location of the center
   (1) Explain about temporary location of the center, arrangements of staff room, lecture room, etc. (If Japanese Grant Aid for some facilities including buildings is delayed.)
   (2) One site for the on the job traning (practice in the field) is not enough, so Japanese Government can't agree. Explain about the suitable sites for the on the job training. (If one site is selected per a year.)

7. About organization and operation of the center
   (1) Explain about administrative situation of the center.
   (2) Explain about arrangement and assignment of Nepalese staffs in the center and ministries they belong to.

8. About equipment to be furnished
   Nothing

9. About undertakings
   (1) Explain about location, area, etc. of land of the center.
   (2) How much local expenditure can be borne and when does it prepare ?

Appendix-B

		1989/1990	1990/1991	1991/1992	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997
	TERM OF JAPANESE COOPERATION		Jul., Oct., Jan.	Jul., Oct., Jan.					
CENTER	TRANING								
	GENARAL COURSE				-	-	-	-	-
	ADVANCED COURSE				—	—	—	—	—
	INTENSIVE COURSE				—	—	—	—	—
	TECHNICAL DEVELOPMENT			—	—	—	—	—	—
	OVERSEAS TRAINING				—	—	—	—	—
	PROJECT DEVELOPMENT BOARD								
JAPAN	SURVEY MISSION		O O	O					
	LONG-TERM EXPERT			—	—	—	—	—	—
	SHORT-TERM EXPERT				—	—	—	—	—
	IXNATION EQUIPMENT			—	—	—	—	—	—
	COUTERPART TRAINING				—	—	—	—	—
	BUILDING AND FACILITIES								
NEPAL	PREPARATION FOR A TEMPORARY CENTER		—	—	—	—	—	—	—
	EQUIPMENTS AND MATERIALS			—	—	—	—	—	—
	STAFFS			—	—	—	—	—	—
	LOCAL COSTS			—	—	—	—	—	—

Appendix-C Plan of the training in the water induced disaster prevention technical center

I. Curriculum for training

① General course

period : 2weeks number of trainee : 5 ~10 number of times : once or twice a year

DATE	PLACE	CONTENTS	JAPANESE EXPERT
1	Lecture room	Beginning ceremony / Orientation	
2		Types and causes of water induced disasters	long-term expert(1)
3		Countermeasures for water induced disaster	long-term expert(1)
4	Outdoor laboratry	Way of hydraulic model experiment (at an outdoor laboratry)	long-term expert(2)
5		Examination of disaster prevention works by experiment	long-term expert(2)
6		Study of a subject	long-term expert(1)
7	———	———	
8	Lecture room	Way of setting a floodmeter,a rain-gauge,a strain-meter,etc. Collection and analysis of these data	long-term expert(3)
9		Way of investigation of landslide,slope failure and river behaviour / Collection and analysis of these data	long-term expert(3)
10	Technical development room	Way of making and setting a wire cylinder	short-term expert long-term expert(2)
11		Study of a subject	long-term expert(1)
12	Lecture room	Subject and prospect of water induced disaster prevention in Nepal	long-term expert(1)
13		Ending ceremony	

Qualification of the trainee : Every engineers concerned with water induced disaster prevention works in each ministry

Purpose : To learn basic techniques of water induced disaster prevention

② Advanced course

period : 3months number of trainee : 5 number of times : once a year

WEEK	PLACE	CONTENTS	JAPANESE EXPERT
1st	Lecture room	Beginning ceremony Lectures (Types and causes of disasters,countermeasures,survey, planning,design,construction and maintenance) Special lecture	long-term expert(1) short-term expert
2nd	Outdoor laboratry	Experiment at an outdoor laboratry	long-term expert(2)
3d	Technical development room	Practice of technical development	short-term expert
4th	Field in the coutry	Practice of a field survey I (Setting of a floodmeter,a rain-gauge, etc.)	long-term expert(3)
5th		Practice of a field survey II (Investigation of landslide,slope failure and variation of channel bed)	long-term expert(3)
6th		Practice of construction in the field I (Countermeasures for alluvial fan)	long-term expert(2) short-term expert
7th		Practice of construction in the field II (Countermeasures for landslide slope failure , river erosion and flood and torrent control)	long-term expert(2) short-term expert
8th		Practice of construction in the field III (Hillside works)	long-term expert(2) short-term expert
9th		Practice of construction in the field IV (Collapse of road)	long-term expert(2) short-term expert
10th	Information room	Practice of collection and arrangement of the data (rainfall, water-level,collapse,variation of channel bed,record of disaster and outline of construction)	long-term expert(3)
11th	lecture room	Writing report	long-term expert(3)
12th		Presentation of the report,discussion / Seminar(subject and prospect)	long-term expert(3)

Qualification of the trainee : Senior engineers of each ministry (include member of local organization)

Purpose : To learn applied technique for implementation of water-induced disaster prevention works

③ Intensive course

period : 12months number of trainee : 5 number of times : once a year

MONTH	CONTENTS	JAPANESE EXPERT
1st	On-the-job training in the center (Planning of training ,technical developoent ,collection and arrangement of information)	long-term expert
2nd	〃	
3d	〃	
4th	〃	
5th	〃	
6th	〃	
7th	The same training as an advanced course	The same training as an advanced course
8th	〃	
9th	〃	
10th	Detail design of various projects	long-term expert short-term expert
11th	〃	
12th	〃	

Qualification of the trainee : Engineers who will be technical staffs in the center and core engineers of the government in the future

Ⅱ.Schedule

month	1	2	3	4	5	6	7	8	9	10~12
	plan to training	invitaion of trainee	preparation of teaching aaterials,etc.	preparation	Genaral course	preparation	Advanced course			
						Intensive course				

Ⅲ.Site

(1) Lecture room,technical developoent room(for equipments),inforaation room(personal coaputers,data racks), office rooas —— In the building of Ministry of Water Resources for the tiae

(2) Outdoor laboratry —— River channel area in Kathaandu(another sheet)
Land,staffs,facilities,aeintenance,etc.should be provided by Nepal.

(3) Fields for practice —— It will be deterained suitably in the coutry.
Lodge for the aeabers,storehouse for equipaents,aeintenance,etc.should be provided by Nepal.

Ⅳ.Equipaent for the training

(1) Textbook,aaterial,etc.

(2) Equipaent for indoor training (lecture room,inforaation room,technical developaent room,etc.)

(3) Equipaent for outdoor laboratry (test apparates,etc.)

(4) Equipaent for field practice

(5) Traveling allowance

another sheet

Outdoor laboratory

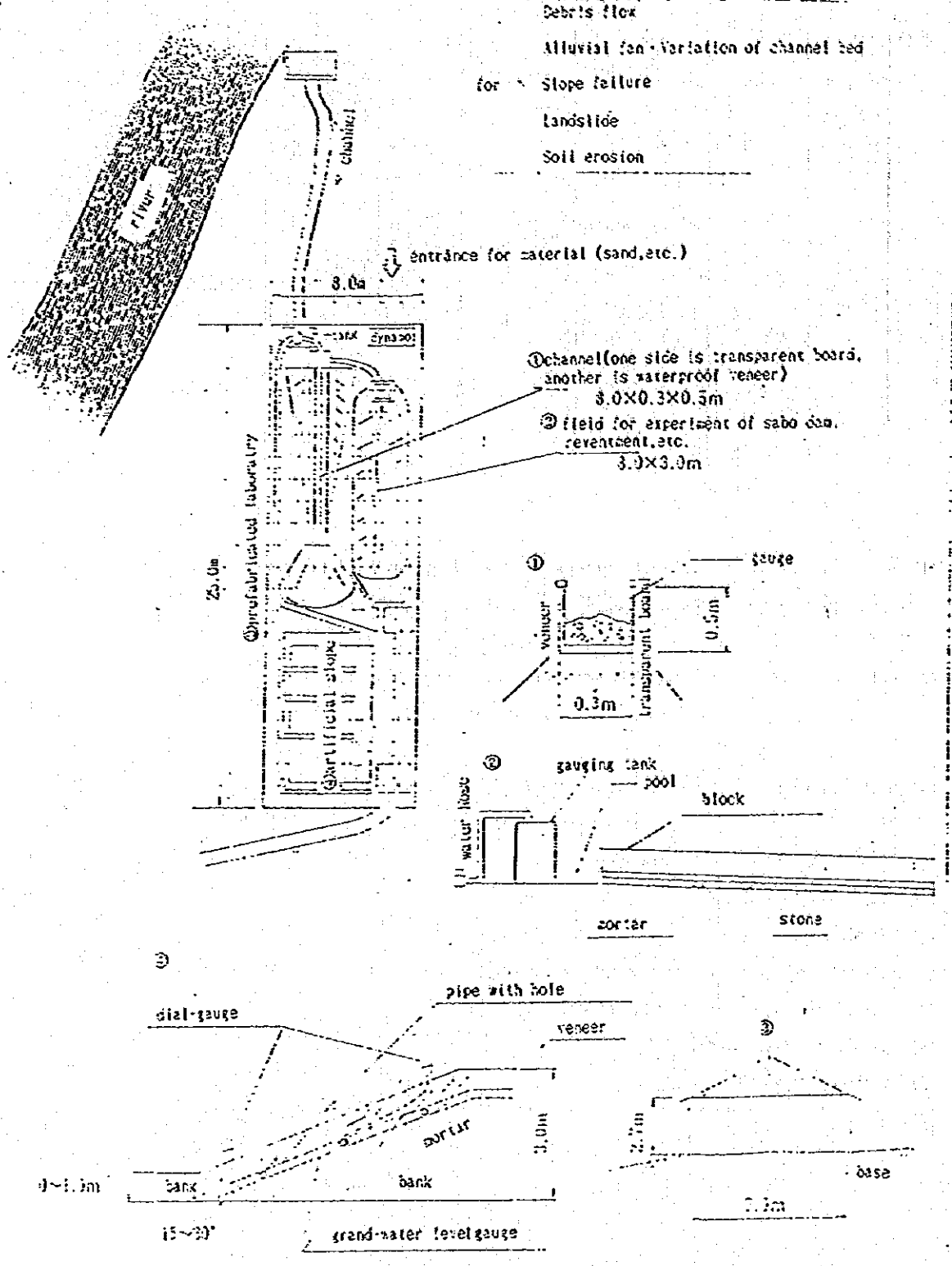
Debris flow

Alluvial fan · Variation of channel bed

for ↘ Slope failure

Landslide

Soil erosion



1) landslide model(effect of drainage boring)

2) gully,slope failure model

LIST OF PARTICIPANTS

JICA Preliminary Survey Team

1. Mr. Shigekiyo TABATA,	Director of the Disaster Prevention Investigation Section, River Bureau, Ministry of Construction
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