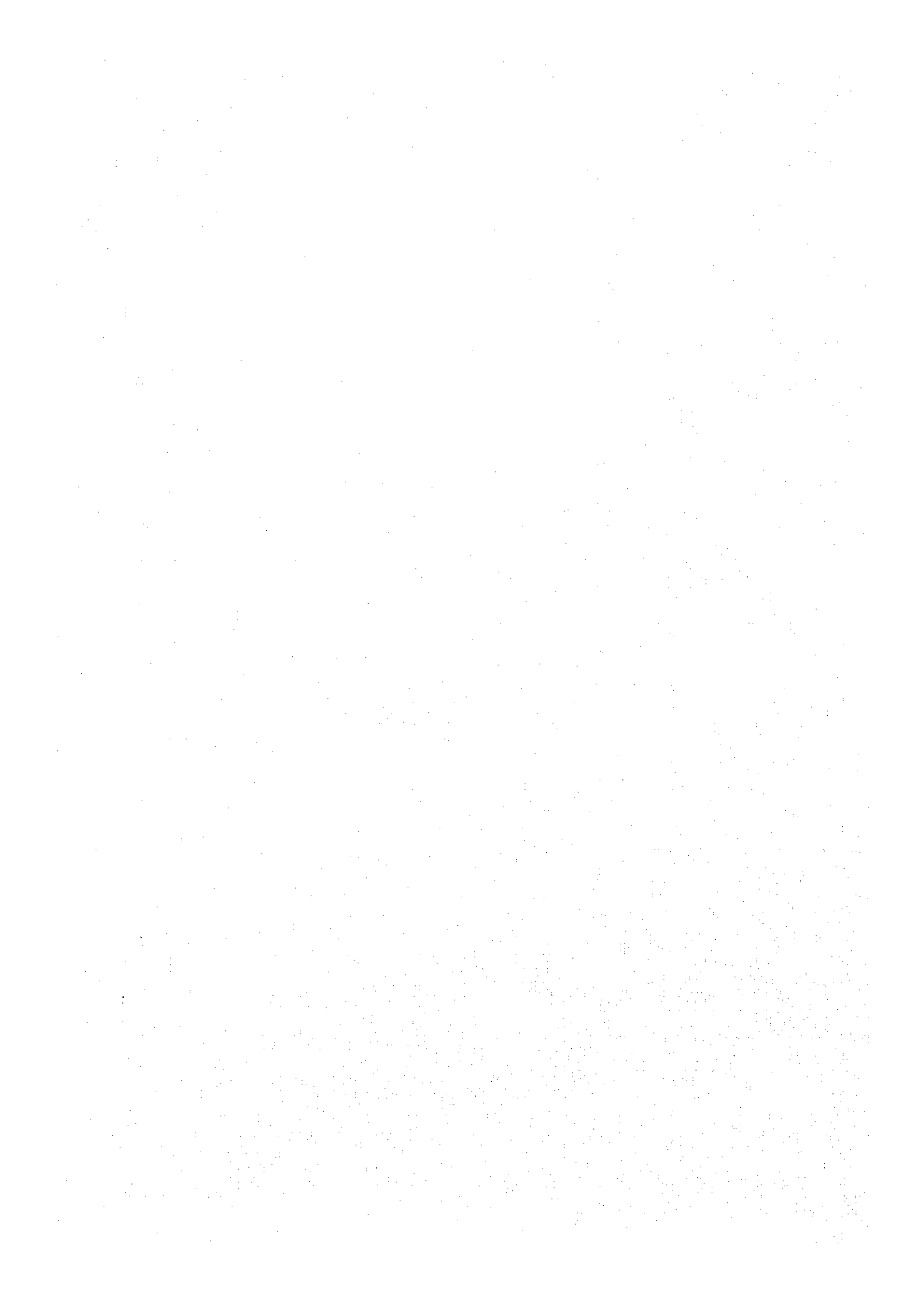


V-2 Letters prepared by the Study Team



LIST OF LETTER (SENT)

NO.	DATE	TITLE
JPU-01	Feb. 16, 1987	INCEPTION REPORT
JPU-02	Feb. 16, 1987	INFORMATION OF GOVERNMENT OFFICES
JPU-03	Feb. 17, 1987	INVESTIGATION REPORT OF DISASTER DUE TO HUAYCO AND INUNDATION
JPU-04	Feb. 17, 1987	INFORMATION AND DATA ON BUDGET AND ACTIVITY OF CNDG
JPU-05	Feb. 17, 1987	ADMINISTRATIVE MANAGEMENT SYSTEM FOR DISASTER PREVENTION
JPU-06	Feb. 17, 1987	DATA OF STRUCTURES
JPU-07	Feb. 18, 1987	USE OF YOUR VEHICLES FOR FIELD RECONNAISSANCE
JPU-08	Feb. 18, 1987	RIVER SURVEY
JPU-09	Feb. 23, 1987	REQUEST LETTER TO GOVERNMENT OFFICES
JPU-10	Feb. 24, 1987	AERO-PHTOGRAPHS
JPU-11	Mar. 09, 1987	RIVER SURVEY
JPU-12	Mar. 13, 1987	PROGRESS REPORT (DRAFT)
JPU-13	Mar. 24, 1987	MEETING HELD ON MARCH 27
JPU-14	Mar. 25, 1987	RECOMMENDATION ON INSTALLATION OF NEW GAGING STATIONS
JPU-15	Mar. 25, 1987	ADDITIONAL DATA COLLECTION
JPU-16	Mar. 27, 1987	PROGRESS REPORT
JPU-17	Apr. 12, 1987	INVESTIGATION ON MARCH 9 DISASTER
JPU-18	May 26, 1987	THE SECOND INVESTIGATION
JPU-19	June 16, 1987	DISASTER PREVENTION PLANNING FOR RIMAC RIVER INVESTIGATION OF ACTIONS TAKEN ACTUALLY FOR THE DISASTER IN MARCH, 1987
JPU-20	June 16, 1987	RIVER SURVEY
JPU-21	June 16, 1987	METEO-HYDROLOGICAL DATA
JPU-22	June 19, 1987	DATA FOR SOCIO-ECONOMY AND PROJECT EVALUATION

NO.	DATE	TITLE
JPU-23	June 22, 1987	INVESTIGATION FOR WATER LAW
JPU-24	June 26, 1987	RIVER SURVEY
JPU-25	June 30, 1987	LECTURE
JPU-26	June 07, 1987	REPORT OF "COMANDO DE EMERGENCIA"
JPU-27	Sept.14, 1987	DISCUSSION ON "INTERIM REPORT"
JPU-28	Sept.18, 1987	VEHICLES AND DRIVERS FOR THE STUDY TEAM
JPU-29	Sept.18, 1987	INSTALLATION OF AUTOMATIC RAINGAGES AND WATER LEVEL GAGES
JPU-30	Sept.24, 1987	CONFIRMATION OF CNDC'S OPINION ON THE PROPOSED ORGANIZATION IN NON-STRUCTURAL MEASURES
JPU-31	Sept.25, 1987	CONFIRMATION OF THE SCHEDULE FOR FINAL DISCUSSION ON THE DRAFT INTERIM REPORT
JPU-32	Sept.28, 1987	RIVER SURVEY WORK FOR THE UPSTREAM REACHES OF CHOSICA
JPU-33	Sept.29, 1987	INSTALLATION OF AUTOMATIC RAINGAGES AND WATER LEVEL GAGES
JPU-34	Oct. 7, 1987	SUBMISSION OF INTERIM REPORT
JPU-35	Oct. 26, 1987	HANDING OVER THE INTERIM REPORT

THE MASTER PLAN STUDY OF THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

February 16, 1987  
No JPU - 01

Mr. Jorge del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil  
San Isidro, Lima

SUBJECT: INCEPTION REPORT

Dear Sir,

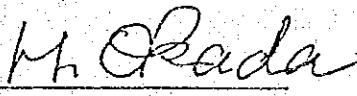
We are pleased to submit you herewith twenty (20) copies of the Inception Report for The Master Plan Study on The Disaster Prevention Project in The Rimac River Basin in accordance with the Scope of Works agreed on November 10th, 1986 in Lima.

In regard to the contents of the Inception Report, the brief explanation by the Study Team and the discussion between the Peruvian side and the Study Team have been made by using the Draft Report. Then the Peruvian side officially agreed to the contents of the Draft Report prepared by the Study Team at the meeting held on February 9, in 1987.

The Inception Report explains the scope of works to be carried out by the Study Team.

The Study Team will try to make an effort to accomplish all the scope of works described in the Inception Report. For this purpose, the Study Team would like to ask your continuous support and cooperation on the Study.

Very Respectfully Yours,

for   
Ryuzo Nishikawa  
Team Leader of  
Jice Study Team

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 16, 1987

No. : JPLI-02

Dr. Victor Murrillo P.  
SE/CNOC

Attention: Ing. Luis Cabrera López  
SE/CNOC

SUBJECT: INFORMATION ON GOVERNMENT OFFICES

Dear Sir,

The Organization chart with the necessary information such as address, function, purpose, etc. of the following government offices are requested to be collected within this week (February 16-21).

- (1) The Republic of Perú (General chart)
- (2) Ministry
  - (a) Agricult
  - (b) Transport
  - (c) Vivienda
  - (d) Interior
  - (e) Economía
  - (f) Industria
  - (g) Marina
  - (h) Guerra
  - (i) Aeronáutica
  - (j) Trabajo
  - (k) Energía
  - (l) Pesquería
  - (m) Salud
  - (n) Relaciones
  - (o) Presidencia
  - (p) Educación
- (3) SE/CNOC (Detail)
- (4) Other Government Offices
  - (a) SENAMI
  - (b) DHINA
  - (c) IMARPE
  - (d) INGEMMET
  - (e) IGP
  - (f) UNI
  - (g) USM
  - (h) UMFU
  - (i) ELECTROLIMA
  - (j) CORDE LIMA
  - (k) CORDE CALLAO
  - (l) COOPOP
  - (m) SEDAPAL
  - (n) OHERM
  - (o) INVERMET
  - (p) INADE
  - (q) IGP
- (5) Departamento Lima
- (6) Provincia (In the Rimac River Basin)
- (7) Provincia Constitucional
  - (a) Callao
- (8) Concejo Municipal de la Provincia de Lima

...

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 17, 1987  
No. : JPU - 03

Ing. Germán Reátegui Orbe  
U.N.M.S.M.

Attention: Ing. G. Chamorro Rodríguez  
SE/CNDC  
Ing. Julio Gamarra V.  
U.N.M.S.M.

SUBJECT: INVESTIGATION REPORT OF DISASTER DUE TO  
HUAYCO AND INUNDATION

Dear Sir,

I would like to request you to collect the investigation report of disaster due to Huayco and inundation. This request is already verbally informed you several times. But, we prepared this letter for confirming our request as the reports of actual disaster are very important for our study.

The required reports are described as follows:

- (1) All the past reports which involve the investigation results of disaster happened in the Rimac river basin.
- (2) Investigation reports of the recent disaster
  - (a) Villa Rica, Oxapampa region
  - (b) Ayacucho
  - (c) Others, if any

Very Truly Yours,



M. Okada  
JICA Study Team

...

(9) Distrito (in the river basin)

- (a) Vitarta
  - (b) Chaclacayo
  - (c) Chosica
  - (d) Ricardo Palma
  - (e) San Bartolomé
  - (f) Surco
  - (g) Matucana
- ⋮

Very Truly Yours,



M. Okada  
JICA Study Team



QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 17, 1987  
No. : JPU - 03

Ing. Germán Reátegui Orbe  
U.N.M.S.M.

Attention: Ing. G. Chamorro Rodríguez  
SE/CNDC  
Ing. Julio Gamarra V.  
U.N.M.S.M.

SUBJECT: INVESTIGATION REPORT OF DISASTER DUE TO  
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  - (b) Ayacucho
  - (c) Others, if any

Very Truly Yours,



M. Okada  
JICA Study Team

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RINAC

Date: February 17, 1987  
No. : JPU - 04

Dr. Victor Murillo P.  
SE/CNDC

SUBJECT: INFORMATION AND DATA ON BUDGET AND ACTI-  
VITY OF CNDC.

Dear Sir,

The following data are requested to be col-  
lected.

1. Budget

- (1) Budget (with breakdown) of the Repu-  
blic of Perú of recent 5 years record.
- (2) Budget (with breakdown) of CNDC of re-  
cent 5 years.
- (3) Acquisition system (method and sche-  
dule) of the budget for CNDC
  - (a) Ordinary annual budget
  - (b) Special budget for disaster  
(if any).

2. Activity of CNDC in regard to Disaster

Please explain briefly about the activity of  
CNDC when the disaster happened at a certain place.  
It is requested to include the following items in  
the explanation.

- (a) Organization of Investigation
- (b) Schedule of investigation
- (c) Method of investigation
- (d) Contents of investigation report
- (e) Others

Very Truly Yours,



H. Okada  
JICA Study Team

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 17, 1987  
No. : JPU - 05

Ing. César Arguedas Madrid

Attention: Ing. G. Chamorro Rodríguez

SUBJECT: ADMINISTRATIVE MANAGEMENT SYSTEM FOR DI-  
SASTER PREVENTION

Dear Sir,

We would like to request you to provide us the information and data in respect of the administrative management system for disaster prevention. The items with some explanation of the required data are listed below:

- (1) National and regional law/rule/standard for administrative management of:
  - (a) River and
  - (b) Disaster
- (2) Method of existing or past forecasting, warning and evacuation system taken at the time of disaster in the Rimac river basin.
- (3) General organization and system of administrative management for disaster prevention or river control.
- (4) Problems and difficulties in regard to present administrative management system: your comments on this matter.
- (5) Other information, if any.

Very Truly Yours,



H. Okada  
JICA Study Team

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 17, 1987

No : JPU - 06

Arq. Lenkiza Angulo V.  
SE/CNDC

Attention: Ing. G. Chamorro Rodríguez (SE/CNDC)  
Ing. Pedro Quevedo (Obras Hidraul.)  
Ing. Jorge Lam Ramírez (DHINA)  
Ing. Filiberto Matos F. (DHINA)  
Ing. Edmundo Turpaud (Ministerio Agric.)  
Ing. Angel Lema (CORLIMA)  
Ing. Fernando Moreno (COOPOP)

SUBJECT: DATA OF STRUCTURES

Dear Sir,

It is requested to collect and provide us the data of Structures located in or along the Rimac river.

- (1) Bridge (Road bridge and Railway bridge)
  - (a) Location map
  - (b) Name
  - (c) Owner or Administrative office
  - (d) Month and year of construction
  - (e) Features (Scale, dimensions, materials, etc.)
  - (f) Drawings (only main drawings)
  - (g) Design report, if any
  - (h) Past disaster
  - (i) Others
- (2) Road  
(a) to (i)
- (3) Railway  
(a) to (i)
- (4) Levee  
(a) to (i)
- (5) Parapet and Revetment  
(a) to (i)

...

- .....
- (6) Channel work and ground sill  
(a) to (i)
  - (7) Intake Weir for city water supply  
(a) to (i)
  - (8) Intake Structures for irrigation water  
supply  
(a) to (i)
  - (9) Intake and outlet of power generation (including Dam)  
(a) to (i)
  - (10) Other structures  
(a) to (i)

As our study period is very short and limited, we would like to expect that your submission of data will be before the following date.

- Feb. 24 for the items (a), (b), (c), (d) and (e)
- March 2, for the items (f), (g), (h) and (i)

Your earlier action is very appreciated by us.

Very Truly Yours,



S. Ezaki  
JICA Study Team

THE MASTER PLAN STUDY OF THE DISASTER PREVENTION  
PROJECT IN THE RIMAC RIVER BASIN

Japan International Cooperation Agency

Date: February 18, 1987  
No : JPU - 07

Mr. Alejandro Wendorff Rodríguez  
Sub-Director Administrativo  
Intituto Geográfico Nacional

SUBJECT: USE OF YOUR VEHICLES FOR FIELD RECONNAISSANCE

Dear Sir,

As already informed you verbally, we would like to borrow your vehicles (4-wheels drive) for our field reconnaissance in the Rimac river basin. The schedule of field reconnaissance as of now is as follows:

- (a) 1 vehicle for Feb. 18 - Feb. 20; 3 days ( 2 nights)
- (b) 1 vehicle for Feb. 20; 1 day
- (c) 1 vehicle for Feb. 27 - Mar. 1; 3 days ( 2 nights)

The additional period to use your vehicle will be informed you later if required. The cost of gasoline and allowance for driver (a.- I/. 150 per day for allowance including meal charge and b.- Actual expense for hotel charge when he is required to stay overnight) will be paid by our expense.

Your kind assistance and cooperation to our study will be highly appreciated, we remain.

Sincerely Yours,



H. Okada

River Study Team

JICA Rimac

cc: Ing. H. Kosuga, IGN

QUESTIONNAIRE/REQUEST FOR THE DISASTER  
PREVENTION STUDY OF THE RIO RIMAC

Date: February 18, 1987  
No : JPU - 08

Ing. César Arguedas Madrid  
SE/CNDC

Attention: Cap. C. AP. César Del Carmen (OHINA)  
May. EP. Gerardo Pérez (IGM)

SUBJECT: RIVER SURVEY

Dear Sir,

Though we discussed several times about the river survey of the Río Rímac which shall be done by the Peruvian government in accordance with the agreement between JICA and CNDC, we would like to request you again in this letter on the matters described below.

(1) Past records of river survey

All the drawings of the past river survey (cross section and profile) for the Rímac river.

Note: the following drawings are already provided for us.

Autopista: Lima-Ricardo Palma  
y  
Encauzamiento Parcial del Río Rímac (prepared by INVERMET in 1982)

(2) Organization of river survey

The organization including the name of representative office and person of the river survey.

(3) Capacity of survey team

The information about the capacity of your survey team. For example, approximate number of cross sections which can be done within one (1) month.

....

....

We would like to prepare the plan/specification of the river survey as early as possible for the earlier commencement of survey. For this object, we need the information/data described above.

Your prompt action is expected by us.

Very Truly Yours,



H. Okada  
JICA Study Team



THE MASTER PLAN STUDY ON THE DISASTER PREVENTION PROJECT IN  
THE RÍMAC RIVER BASIN

Japan International Cooperation Agency

Date: February 23, 1987  
Nº m: JPU - 09

Galm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil  
San Isidro, Lima

Re: Request Letter to Government Offices

Dear Sir,

You are kindly requested to prepare the letters to the Government Offices listed below for their assistance to our data collection.

- |                     |                            |
|---------------------|----------------------------|
| (1) MINIST. TRANSP. | (10) SENAMHI               |
| (2) MINIST. AGRICU. | (11) II RDC                |
| (3) MINIST. VIVIEN  | (12) MUNIC. DIST. LIMA     |
| (4) ENAFER.         | (13) MUNIC. DIST. CALLAO   |
| (5) SEDAPAL         | (14) MUNIC. DIST. ATE      |
| (6) INVERMET        | (15) MUNIC. DIST. CHACLAC. |
| (7) CORDE LIMA      | (16) MUNIC. DIST. CHOSICA  |
| (8) CORDE CALLAO    | (17) MUNIC. DIST. MATUCANA |
| (9) ELECTRO LIMA    | (18) MUNIC. DIST. SAN MAT. |

We tried to get the necessary data in regard to the past disaster in the Rímac river basin and the structures located in or along the Rímac river by sending the letters (JPU-03 and 06 dated Feb. 17) to our counterparts selected by CNDC. But, we couldn't get sufficient answer from the counterparts as of today.

Therefore, it is necessary for us to visit each office directly by ourselves with the official letter prepared by CNDC.

We would like to expect your prompt action on this matter.

Very Truly Yours,



H. Okada  
JICA Study Team

c.c.: Ing. César Arguedas Madrid (SE/CNDC)  
Ing. Guillermo Chamorro Redríguez (SE/CNDC)  
Arq. Lenkisa Angulo Villarsol (SE/CNDC)

THE MASTER PLAN STUDY ON THE DISASTER PREVENTION PROJECT IN  
THE RIMAC RIVER BASIN

Japan International Cooperation Agency

Date: February 24, 1987  
No : JPU - 10

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil  
San Isidro, Lima

Re: Aero-Photographs

Dear Sir,

We would like to request you to prepare the official letter to the related offices for obtaining the Aero-photographs taken in the Rimac river basin.

We already borrowed from SE/CNOC the aero-photographs of 1/40,000 in scale which cover almost the whole basin and were taken in 1962. But, we are informed that the following aero-photographs were also made in the past.


	<u>Year</u>	<u>Scale</u>	<u>Owner</u>
(1) Whole basin	1983	1/60,000-1/80,000	DGA
(2) Lima and its vicinities	1984	1/20,000	IGN?
(3) ---ditto---	1976	1/2,500	IGN?
(4) Lima city	1974	1/17,000	IGN?
(5) Agricultural area	1971	1/17,000	IGN?

We would like to borrow the above photographs as soon as possible.

The aero-photographs are required to see the various conditions of the basin on a large scale especially for the area where the access to the site is difficult. Further, the aero-photographs taken in the same area in different years are available to know the historical movement of topography, river course, land use, etc.

Your prompt action on this matter is expected by us.

Respectfully Yours,

  
Dr. M. Suzuki  
JICA Study Team

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: March 09, 1987  
Nº : JPU -11

Calm. Jorge A. Del Aguilla Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil  
San Isidro, Lima

Re: River Survey

Dear Sir,

Submitted herewith this letter is the Plan and Specifications for River Survey in the Rimac River and the Santa Eulalia River. The specifications are made after discussion and agreement among the representatives from SE/CNDC (Ing. César Arguedas Madrid and Ing. Guillermo Chamorro Rodríguez), I.G.N. (Mayor E.P. Gerardo Pérez), DHINA (Cap. Corb RP. Cesar Del Carmen and Ing. Jorge Lam Ramírez), DGAF (May.FAP Vivar Gamarra), DGASI (Ing. César A. Benites Chunga) and the Study Team (M. Suzuqui, H. Okada and M.Sakurai).

The more specific and detailed matters which are not shown in the specifications are explained in the meeting held several times for these three weeks. However, the Study Team is always ready to discuss the river survey more specifically with the Peruvian persons in charge during the Study Team's staying in Lima.

Though it is already agreed in the meeting, the Study Team would like to confirm the following points.

- (1) The river Survey including the preparation of drawings shall be started earlier, if possible before March 20, and completed before May 15, 1987.
- (2) The interval of cross section survey shall be the same as or shorter than the interval described in the specifications.

If you can not accomplish the work, it is requested for you to inform us the matter as earlier as possible. In this case, we have to discuss the alternative plan for

river survey.

We thank you for your cooperation and assistance on matters mentioned above

Very Truly Yours,



H. Okada  
JICA Study Team

Attachment: Plan and Specifications for River Survey in the Rímac River and the Santa Eulalia River.

Copy to : Ing. César Arguedas Madrid (SE/CNDC)  
Ing. Guillermo Chamorro Rodríguez (SE/CNDC)  
May. EP Gerardo Pérez (I.G.N.)  
Cap. Corb. RP César Del Carmen (DHINA)  
Ing. Jorge Lam Ramírez (DHINA)  
May. FAP Vivar Gamarra (DGAF)  
Ing. César A. Benites Chunga (DEASI)

THE REPUBLIC OF PERU

PLAN AND SPECIFICATIONS

FOR

RIVER SURVEY

IN

THE RIMAC RIVER AND

THE SANTA EULALIA RIVER

MARCH 1987

JAPAN INTERNATIONAL COOPERATION  
AGENCY

TOKYO - JAPAN

copy 2

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1.- Introduction.-

The river survey of the Rimac River Basin shall be done by the Peruvian Government in accordance with the agreement between JICA and CNDC for making the necessary data for the master plan study on disaster prevention in the Rimac River Basin.

Since the JICA Study Team arrived in Perú on February 1<sup>st</sup>, 1987, the discussion on the River survey was occasionally carried out. Though there will be some unknown information and data, the plan and specifications of river survey were prepared on the basis of information and data already obtained. If any modification is required later, the addendum of this report will be prepared.

More specific matters on the river survey which are not shown definitely in this report shall be explained and discussed in the meeting attended by the persons concerned.

2.- Scope of Work.-

River profile and cross section survey.

3.- Work Period.-

Beginning: Before March 20, 1987

End : Before May 15, 1987

Note : The working period includes the period of field survey as well as preparation of report and drawings.

4.- Output of Survey.

(1) Drawings of River Profile

- Profile of river bed, water surface and both banks.

- Scale  $V = 1/500$

$H = 1/5,000$

- The following items shall be shown.

. Accumulative distance at survey points.

. Distance (between each survey point).

. Elevation of river bed, water surface, and both banks at surveys points.

. Location of Major structures such as bridge and weir.

. Location of Tributaries.

- Paper Size : A 1

- By Inking

(2) Drawings of River Cross Section

- Cross sections of all the survey sections.

- Scale :  $V = 1/500$

$H = 1/200$

- The following items shall be shown at each cross section.

. Reference point or distance of the river profile survey.

. Elevation of all the survey points.

. Distance between each survey points.

. Ground (river bed) , both banks and water surface profiles.

. Structures.

. Other reference notes.

- Range of section shall be more than 30m toward the land side edges of channel side on both banks.

- Paper size : A 1

- By Inking

(3) Index Map of Cross Sections

The location of all the lines of cross section survey shall be shown in the maps of  $1/5,000$  (if available) in scale as well as  $1/25,000$  in scale. In this map, the location and elevation of bench mark shall be shown.

(4) Data Book

All the back data of survey shall be compiled.

5.- Preparatory Works.-

5.1 . Coordination of Survey Team

It was informed by SE/CNDC that the survey teams of the following governmental offices would share the survey.

(a) DHINA

(b) IGN

(c) DGAF

(d) DGASI

It is necessary to make clear the partial charge of survey team if some survey teams carry out the work during the same period. Additionally, the basic Specifications for survey and preparation of documents shall be the same for each team. SE/CNDC is required to take necessary coordination specially at the stage of preparatory work.

## 5.2 Confirmation of National Bench Marks.

The National bench marks shall be confirmed for their locations and present conditions before the commencement of the actual surveying works.

## 5.3 Confirmation of Schedule

The survey is required to be completed within almost two months; before the middle of May. It is necessary to confirm the schedule before starting the field works.

## 5.4 Study of Survey Method

There are some difficult sections for survey such as the gorge sections and the sections confined by high parapet walls.

The method of survey as well as the survey equipment shall be carefully studied in prior to the field works.

## 6.- River Profile and Cross Section Survey

### 6.1 Profile Survey

Spot elevation for each profile shall be surveyed at every line of cross section survey and at the changed portion of the topographical slope.

The profile survey shall be carried out along the following lines.

- a) River bed (center of river channel)
- b) Water surface
- c) Channel side edge on the left and right banks

Note: If the survey at the river bed is difficult, it is accepted to cancel it.

The checking survey by returning the same route shall be carried out. The difference between going and returning shall be within  $10 \times \sqrt{S}$  (cm) for the elevation and  $1/200$  for the distance.

S: distance in Km.

The basin height of profile survey shall be the near-  
by national bench mark or the temporary bench mark extended  
from the national bench mark.

## 6.2 River Cross Section Survey

Cross Section survey shall be done in the following  
intervals along the river.

### (1) SECTION 1 : River Mouth - PUENTE FAUCETT

Lenght : Approx. 5 Km

Interval of Survey Section: 200 m

Additional Section : Downstream of each  
bridge

Number of Survey section : Approx. 26 nos + 4 nos\*

### (2) SECTION 2 : PUENTE FAUCETT - SEDAPAL WEIR

Lenght : Approx. 16 Km.

Interval of Survey Section: 500 m.

Additional Section : Downstream of each  
bridges

Number of Survey section : Approx. 33 nos + 10 nos\*

### (3) SECTION 3 : SEDAPAL WEIR - Confluence of the Rimac River and the Santa Eula- lia River

Lenght : Approx. 36 Km.

Interval of Survey Section: 1 Km

Additional Section : Downstream of each  
bridges

Number of survey section : Approx. 37 nos + 7 nos\*

(4) SECTION 4 : Confluence of the Rimac River and the  
Santa Eulalia River - San Mateo.

Lenght : Approx. 52 Km  
Interval of Survey Section : 1 Km  
Additional Section : Downstream of each  
bridges  
Number of Survey Section : Approx. 53 nos + 10 nos\*

(5) SECTION 5 : Confluence of the Rimac River and the  
Santa Eulalia River - Carampora (Confluence)

Lenght : Approx. 39 Km  
Interval of Survey Section : 1 Km.  
Additional Section : Downstream of each  
bridges  
Number of survey section : Approx. 40 nos + 6 nos\*

Note: \*) Number of bridges is not confir-  
med yet.

The Cross-section line shall be extended upto the rela-  
tive hight of 20 m above the water surface or 30 m from the  
channel side edges on both banks in the minimum case. The water  
surface elevation shall also be surveyed.

Intervals of Survey point shall not be more than 20 m.  
In addition the survey shall be made at all points where topo-  
graphical slope changes.

The checking survey by returning the same route shall be  
carried out. The difference between going and returning shall be  
within  $5\text{cm} + 15\text{ cm} \sqrt{S/100}$  for the elevation and  $1/200$  for the dis-  
tance.

S= distance in M.

The basic height shall be brought from the nearby National  
bench mark or the temporary bench mark extended from the national

bench mark.

7.- Other Specifications

(1) Zero (0) point of the survey shall be the center line of Puente del Arsenal (N<sup>o</sup> 1 bridge from the river mouth)

(2) At the meeting sections of

Section 1 and Section 2

Section 2 and Section 3

Section 3 and Section 4

Section 4 and Section 5

Both survey teams shall carry out the survey of additional one (1) or two (2) cross sections toward the section in charge of another team.

(3) Survey point for cross section shall include the survey points for profile.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: March 13, 1987

Nº : JPU - 12

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil  
San Isidro, Lima

RE: Progress Report (Draft)

Dear Sir,

Submitted herewith this letter are three (3) copies of the Progress Report in draft form for the Master Plan on the Disaster Prevention Project in the Rimac River Basin.

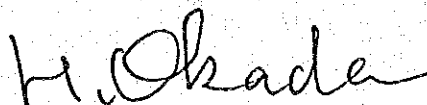
We would like to request you to review this Report. Your comments, if possible in writing, on this Report are necessary to be given to us before March 20. We have to consider the time for modification (if required) and for printing & binding of the Report.

Brief explanation and discussion will be made on March 16 or 17 if your time is available.

The Progress Report in final form will be submitted you before March 27, 1987.

Thank you for your cooperation and assistance to us.

Very Truly Yours,



Hiroshi Okada  
JICA STUDY TEAM



THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: March 24, 1987

No. : JPU - 13

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Dear Sir,

Re: Meeting held on March 27

Though we already verbally informed you the program of meeting to be held on March 27, we would like to confirm the program by this letter as follows:

Date : March 27, 1987

Time : AM 9:00 - 11:00

Place : to be arranged by SE/CNDC

Program :

- (1) Submission of Progress Report
- (2) Signature and brief explanation on Minutes of Meeting held on March 24.
- (3) Lecture
  - (A) Administrative Management for Natural Disaster in Japan  
by Mr. R. Nishikawa (Team Leader)
  - (B) Project Evaluation  
by Mr. M. Tada (Socio-economist)

The meeting is the last one in the first stage of study, from Feb. 1 to the end of March. Therefore, it is expected that all the counterparts of the Study Team can participate in the meeting.

Additionally, we would like to request you that the meeting can start exactly at AM 9:00 without delay as the time of Study Team is limited. Please inform the probable attendants about this matter.

Sincerely Yours,

*Ryuzo Nishikawa*

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Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

c.c.: Ing. César Arguedas Madrid (SE/CNDC)

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: March 25, 1987

No. : JPU - 14

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Recommendation on Installation of New Gaging Stations

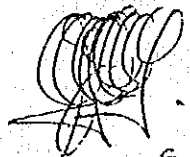
Dear Sir,

Attached herewith this letter are five (5) copies of the report entitled "Recommendation on Installation of New Gaging Stations".

The brief explanation of the report (draft) was already made on March 17 to Peruvian counterparts and the field instruction for installation of rainfall gages and streamflow gages was carried out on March 20 and 21.

We would like to request you to install, operate and maintain the new gaging stations based on the said report.

Sincerely Yours,



J.E. Obregon G.

*Ryuzo Nishikawa*  
Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

c. c. : Mr. Luis G. Brera Kaik (SENAMHI)  
Mr. Gómez (SENAMHI)  
Mr. Arguedas (SE/CNDC)  
Mr. Oscar Trejo (SE/CNDC)



RECOMMENDATION ON THE INSTALLATION

OF

NEW METEO-HYDROLOGICAL STATIONS

(Revised)

MARCH 1987



### 1. Introduction

Though the Study Team already submitted the report entitled "Recommendation on the Installation of New Meteo-Hydrological Stations" as a appendix of Progress Report, it was required to revise the said report after the meetings held on March 17 and 19 and the field inspection of proposed sites on March 20 and 21.

### 2. Administrator of New Gaging Stations

It was confirmed in the meeting held on March 17 that SENAMHI is the administrator in charge of installation, operation and maintenance of new rainfall and streamflow gaging stations.

### 3. Location of New Stations

Definite locations of new rainfall and stream gaging stations were decided by the hydrologists of the Study Team and SENAMHI as follows:

#### (1) Rain gage station

##### (a) Canchacalla

The site is located at left bank of Qda. Canchacalla. A wide open-aired space at the opposite side of the village is available. It is recommended to set the instrument at river side apart from the steep slope of mountain.

##### (b) Chaute

The site of the new station was selected beside the small football ground (about

800 m<sup>2</sup>) located around the center of the village.

(c) Casapalca

The site is located around the center of the town and along the river on left bank. Open space of approximately 200 m<sup>2</sup> enclosed by a fence is available in front of the stock yard and repair shop of CENTROMIN PERU.

(d) Autisha

The new automatic rain gage shall be installed beside the present rain gage where is located on the hill of right bank near the roadway bridge.

(2) Stream flow gage station

(a) Qda. Suncha:

The site is located at just upstream side of the confluence with Qda. Pallca. The water level gage shall be installed at left bank side. A staff gage is recommended to be set beside the existing gage.

(b) Pte. Piedra (Lima)

The well for the water level gage shall be constructed at left bank at the just upstream side of existing ground sill located at downstream stretch of the bridge. The staff gage shall be also install at the the same location.



#### 4. Schedule of Installation Works

Installation works of the new rain gages are requested to be carry out at earliest opportunity to commence the observation as soon as possible. On the other hand, the new water level gages should be installed when the water level descends to the lowest level in the dry season in this year.

Setting of the each instrument at field shall be carried out according to the instruction manual prepared by the manufacturers of the instruments.

Schedule of the installation works to be carried out by SENAMHI is recommended tentatively as follows:

Rain gage (4 locations) : April 1987

Water level gage (2 locations) : July 1987

When SENAMHI needs mobilization to install the new instruments, CNDC shall lend temporarily to SENAMHI a 4 wheels-drive vehicle provided by JICA.

#### 5. Monitoring

The routine observation works shall be entrusted to a inhabitants living near the station. Since the skillness of the observer makes much influence on the accuracy of record, the initial education of proper manner for observation is essentially needed.

Further, in order to let observers confirm the manner at anytime, it is recommended to prepare the following manual and guidelines.

- (1) Guideline for observation
- (2) Maintenance manual of instruments
- (3) Guideline for arrangement of record

The contents in the above documents shall be described specifically to show the appropriate way of handling and treatment at the time of any possible troubles.

In order to keep continuous and accurate observation without interruption of record, some suggestion is provided as follows.

(1) Reporting

It is necessary to establish an organization to tie the field observers with the control center. Troubles on the observation works shall be reported to the center by the observer as soon as possible. In response to the report, prompt action is required to keep close communication.

(2) Inspection

In order not to interrupt continuous observation, regular inspection of each station (at least once a month) is quite important. Current problem of the observation works can be investigated through the inspection.

Further, beside the three kinds of manual mentioned above a note for inspection is to be prepared at each station. In this note, the following condition shall be reported by the inspector.

- (a) Condition of the observer
- (b) Condition around the station
- (c) Availability of record
- (d) Condition of each instrument equipped
- (e) Condition of recording in note
- (f) Stock of consumable materials

(3) Format of record

Recording format shall be unified for each measuring item to make filing and researching easily.

(4) Education

In accordance with the skillness and understandings of the observer, education on the proper manner for observation and handling of instruments shall be given at any opportunity.

6. Data Arrangement

The observed data is to be collected and stored in good order by the data management section in SENAMHI head office.

As for rainfall record, it is recommended to prepare a data format of hourly-basis record which is read on the recording chart. For the purpose of more detailed investigation on Huayco mechanism, short-interval rainfall record is quite essential. Therefore, data processing from the recording chart of automatic rainfall gage shall be carried out as one of routine works at the data management section.

The water level chart shall be processed as the existing stations.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date : March 25, 1987

No. : JPU - 15

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Additional Data Collection

Dear Sir,

We would like to request you to collect additional data for assisting our study. The additional data listed in the attachment are expected to be given to us in the middle of May when the members of Study Team are scheduled to come to Peru again.

It is important and available for the Master Plan Study on the disaster prevention project in the Rimac river basin to collect the additional data which the Study Team could not sufficiently collect due to the shortage of time.

We would like to request you to nominate Dr. Victor Murillo Pino and Ing. Guillermo Chamorro Rodríguez as the chief coordinators for the additional data collection. Both of them will well understand our request as they could work together with JICA Study Team during the last one or two months.

We would like to expect your understanding and assistance to our study.

Very Respectfully Yours,

*Ryuzo Nishikawa*

Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

c.c.: Ing. César Arguedas Madrid (SE/CNDC)  
Ing. Guillermo Chamorro Rodríguez (SE/CNDC)  
Dr. Victor Murillo Pino (SE/CNDC)

List of Additional Data

1. Records of Disaster happened in the early part of March, 1987.
  - (1) Disaster Conditions
    - (a) Location (with map)
    - (b) Distribution of erosion and deposits (debris, mud)
    - (c) Quantity of deposits (with breakdown)
    - (d) Cause of disaster
    - (e) Time of disaster
    - (f) Others
  - (2) Damage Conditions
    - (A) Directo damage in each disaster area
      - (a) Human (death, missing, wounded)
      - (b) Building (with classification of Building and classification of damage extent)
      - (c) Cultivated land
      - (d) Public facilities/structures (road, railway, bridge, etc.)
      - (e) Animal
      - (f) Others
    - (B) Indirect damage
      - (a) Traffic block
      - (b) Economic activity
      - (c) Social aspect
      - (d) Others
  - (3) Rehabilitation and relief activity taken by the Government and the other organization
  - (4) M<sub>e</sub>teo-hydrological data of all the gaging station in the Rimac river basin in the first half of March 1987
    - (a) Rainfall (date, intensity, duration and amount)
    - (b) Temperature
    - (c) Discharge
    - (d) Water level
  - (5) Data in regard to Decreto Supremo 025 and 026 issued on March 11, 1987
    - (a) Description of Decreto Supremo 025 and 026.

- (b) Organization and Function of each section of Comité de Emergencia.
  - (c) Work items carried out by Comité de Emergencia and by SE/CNDC.
  - (d) Output and/or Report prepared by Comité de Emergencia and by SE/CNDC.
- (6) Reports and Maps prepared by SE/CNDC and the other offices.
  - (7) Others, if any

## 2. Meteo-Hydrological Data

- (1) Study Report and bolletin on natural resources in the Rimac river basin prepared by ONERN after 1975.

## 3. Aerophotographs

- (1) Additional new photographs taken after the disaster for the whole catchment areas of Qda. Cashahuacra, Qda. San Antonio, Qda. Quirio, Qda. Sta. Maria located in Chosica district.
- (2) New photographs taken for river survey.

## 4. Data for Structural Plan and Design

- (1) Data of bridges, river structures, etc. from CORDE CALLAO (Location, plan, profile and cross sections, etc).
- (2) Data of structures of river protection works from INVERMET, COOPOP.
- (3) Construction cost per Km for new road between Ricardo Palma and Matucana under construction by MTC and for railway operated by ENAFER.

## 5. Data for Socio-Economy

- (1) General Socio-economic data covering province Huarochiri (to be collected at Development institution of micro region in Matucana)

- (2) Mid-term planning of development in Peru (to be collected at INP)
- (3) General Data concerning to commercial and service sector with special reference to Lima & Callao Metropolitan Area. (to be collected at Ministry of Commerce)
  - Outline of above sectors
  - Type of establishments
  - The number of establishments
  - Monthly or yearly sales by type of establishment
- (4) Land use condition of the Rimac river basin
- (5) Housing scheme
  - A plan of resettlement area ( to be collected at Ministry of Vivienda)
  - Construction planning by type of houses ( to be collected at ENACE)
  - Unit construction cost by type of houses (to be collected at ENACE)
  - Loan repayability of house owner by income class (to be collected at ENACE)
- (6) Electricity tariff by consumer categories (to be collected at ELECTRO LIMA)
- (7) Water tariff by consumer categories ( to be collected at SEDAPAL)

#### 6. Data for Project Evaluation

- (1) An average rate of import and sales tax by categories of consumer and producer goods (to be collected at Ministry of Economy and Finance)
- (2) A portion of subsidy by categories of consumer and producer goods
- (3) Type and volume of consignment by railway from January to December in 1983, 1984, 1985 (to be collected at Empresa Nacional de Ferrocarriles)



## 7. Data for Institutional Study

- (1) Budget and expenditure data of institutions relating Disaster Prevention Project in 1983, 1984, 1985
  - Irrigation (to be collected at Irrigation section of M.A.)
  - Water supply and sewage (to be collected at SEDAPAL)
  - Railway (to be collected at Empresa Nacional de Ferrocarriles)
  - Electricity (to be collected at ELECTRO LIMA)
  - House (to be collected at M. of Vivienda)
  - House construction (to be collected at ENACE)
  - Housing fund (to be collected at FONAVI)
  - Road (to be collected at MTC)
- (2) Operation and maintenance cost relating to Rimac river management (disaster prevention) in 1983, 1984, 1985
  - Irrigation facilities (to be collected at Irrigation section of M.A.)
  - Railway (to be collected at ENAFER)
  - Water Supply facilities (to be collected at SEDAPAL)
  - Hydro power stations and relating facilities (to be collected at ELECTRO LIMA)
  - Cooperation Popular (to be collected at COOPOP)
- (3) Operation and maintenance system in routine and emergency (disaster case)
  - Irrigation facility (to be collected at Irrigation of M.A.)
  - Railway (to be collected at ENAFER)
  - Water supply (to be collected at SEDAPAL)
  - Hydro power stations (to be collected at ELECTRO LIMA)

Note:

Questions to each office

- (a) Organization system
- (b) Location of O&M engineering section
- (c) Commanding area of above each sections
- (d) Man-power system

- (e) Specific actions of maintenance or rehabilitation against disaster in 1983
- (f) Decision-making process of maintenance and rehabilitation
- (g) Insufficient level of machines and equipments in case of emergency.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: March 27, 1987

No. : JPU -16

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Progress Report

Dear Sir,

It is our pleasure to submit you herewith twenty (20) copies of the Progress Report for the Master Plan on Disaster Prevention Project in the Rimac River Basin in accordance with the Scope of Works agreed between JICA and SE/CNDC on November 10th, 1986.

This Progress Report presents the results of investigation and study as of the middle of March, 1987. No description about the disaster happened on March 9 could be included in this Report.

The brief explanation of the Report in draft form was made on March 17 and 24 to the Peruvian counterparts. Then Peruvian side were contented in the said report.

The Study Team would like to appreciate your cooperation and kind assistance to us.

Very Respectfully Yours,

*Ryuzo Nishikawa*

Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

c.c.: JICA, TOKYO  
JICA, LIMA

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: April 12, 1987

No.: JPU-17

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comite  
Nacional de Defensa Civil

Re: Investigation on March 9 Disaster

Dear Sir,

First of all, we would like to inform you our feeling of thanks on your kind cooperation to the study for Rimac River disaster prevention.

We could carry out our study almost on schedule during our staying in Peru. We appreciate your assistance for data collection and field reconnaissance. In addition, our office space and facilities provided by you made good working condition.

It is regrettable for us that we could not sufficiently express our greetings to you before our leaving from Lima. However, we expect that you could understand our busy condition on the last day in our office.

By the way, our study have to continue to the next stage after the first field investigation carried out in February and March. In the present schedule, some members of the Study Team will come to Peru for the second field investigation in June. At that time, the detailed investigation of the disaster happened on March 9 this year will be carried out. However, for this investigation, we need your official request as the investigation of new disaster was not included in the scope of works at present.

Therefore we would like to request you to send a letter on this matter to JICA Tokyo office through JICA Lima office. The example of the said letter is attached herewith this letter.

Your kind understanding and prompt action is always appreciated by us.

Sincerely yours,

*Ryuzo Nishikawa*

Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

Attachment: Letter entitled "Additional Investigation  
for Rimac River Disaster Prevention Study"

COMITE NACIONAL DE DEFENSA CIVIL

Date: April , 1987

No.:

Japan International  
Cooperation Agency  
Tokyo, Japan

Re: Additional Investigation for Rimac River  
Disaster Prevention Study

Dear Sir,

As for the serious disaster of debris flow and inundation happened in the Rimac river on March 9, 1987, we would like to request you to carry out the investigation by the JICA Team for the master plan study on the disaster prevention project in the Rimac River Basin

The results of investigation by the JICA Study Team on the said disaster will be available not only for the master plan study but also for a good sample of disaster investigation in Peru.

It is suggested to carry out the said investigation as early as possible. The Peruvian side will provide the necessary data and assistance to the Study Team.

We will appreciate your understanding and cooperation on this matter.

Sincerely yours,

\_\_\_\_\_  
Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comite  
Nacional de Defensa Civil

c.c. JICA Lima office  
JICA Study team

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: May 26, 1987

No.: JPU-18

Calm. Jorge A. Del Aguila Sanches  
Director Superior del Comite  
Nacional de Defensa Civil

Re: The Second Investigation

Dear Sir,

We would like to inform you the second investigation of the Rimac river basin as follows:

- (1) Schedule of arrival at Lima  
June 12, 1987 by PL 621
- (2) Schedule of departure from Lima  
July 7, 1987
- (3) Member
  - Mr. Norizo Fujita\* (Acting Team Leader)
  - Mr. Hiroshi Okada (Disaster Prevention Plan)
  - Mr. Mamoru Suzuki (Geology and Topography)
  - Mr. Masaki Sakurai (Disaster Survey)
  - Mr. Hiroshi Onodera (Const. Plan and Cost)

\* Mr. N. Fujita newly became a member of  
the Study Team.

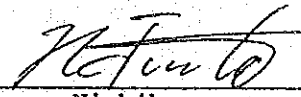
The following matters are requested to be prepared before our arrival.

- (1) Peruvian Counterparts
  - One counterpart for each member of the Study Team.
  - It is expected that Peruvian counterparts can work together with the Study Team.
- (2) Office
  - Office space and facilities for 5 members, Peruvian counterparts and some local temporary employees.

- (3) Vehicles
  - 3 vehicles (Nissan Land Cruiser) will arrive in Lima by ship on May 28.
  - Please take them out from the port as early as possible.
  - We expect that 3 vehicles with drivers will be ready to use for the Study Team from May 12.
- (4) Results of River Survey
  - The results of river survey conducted by Peruvian side are scheduled to be handed over to the Study Team.
- (5) Installation of New Gaging Stations
  - The progress of installation of new rainfall and stream gaging stations is scheduled to be informed to the Study Team.
- (6) Data requested by Our Letter
  - The data requested by our letter (JPU-15 dated on March 25) are expected to be given to the Study Team.
  - Especially, the various records of March 9 disaster are inevitable data.

Your kind assistance and cooperation on the above matters will be highly appreciated.

Sincerely yours,

*for*   
\_\_\_\_\_  
Ryuzo Nishikawa  
Team Leader of  
JICA Study Team

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 16, 1987

Nº : JPU-19

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Dear Sir,

Subject: Disaster Prevention Planning  
for Rimac River

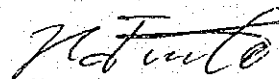
Investigation of Actions taken  
actually for the Disaster  
in March, 1987

JICA Study Team is investigating the actual actions taken for the disaster which occurred on March 9, 1987. A desirable organization for the disaster prevention will be examined in the study in due consideration of the actual actions taken for the disaster in March 1987.

Then, you are kindly requested to prepare the answers for questions as attached hereto, and also to collect the relevant reports.

Your kind cooperation and prompt action for the matter will highly be appreciated, we are,

Sincerely Yours,



N. FUJITA  
Team Leader of JICA  
Study Team, Disaster  
Prevention Planning  
for Rimac River

cc: CN AF Mario Ramírez  
Arq. Renquiza Angulo

*Recibido  
17/6/87  
[Signature]*



INVESTIGACION DE LAS ACCIONES TOMADAS EN EL DESASTRE

OCURRIDO EL 9 DE MARZO DE 1987

(Incluido a JPU-19))

Preguntas

1. ¿Quién informó el desastre a SE/CNDC?
2. ¿Cuándo fue dada la información a SE/CNDC?
3. ¿Cómo fue dada la información a SE/CNDC?
4. ¿Quién recibió la información en SE/CNDC?
5. ¿Cómo manejó SE/CNDC el asunto cuando la información fue dada a SE/CNDC?
6. ¿Fue el grupo de investigación del desastre organizado?
7. ¿Quién organizó el grupo de investigación?
8. ¿Cómo estuvo compuesto el grupo?  
(Ministerios concernientes y funciones)
9. ¿Fue en el primer momento el reporte preparado?
10. ¿Quién preparó el primer reporte?
11. ¿A quién fue entregado el primer reporte?
12. ¿Cuándo fue preparado el primer reporte?
13. ¿Quién evaluó el primer reporte preparado?
14. ¿Cómo fue evaluado el primer reporte?
15. ¿A quién fue entregado el resultado de la evaluación?
16. ¿Qué clase de ayuda fue dada a la zona de desastre?
17. ¿Qué ministerios enviaron la primera ayuda?
18. ¿Cuándo llegó la primera ayuda al area del desastre?
19. ¿Fue preparado un reporte más detallado?
20. ¿Quién preparó el reporte más detallado?
21. ¿A quién fue entregado el reporte más detallado?
22. ¿Quién evaluó el reporte más detallado?
23. ¿A quién le fue entregado el resultado de la evaluación?
24. ¿Cual fue el resultado de la evaluación y las recomendaciones?

25. ¿Qué clase de decisión fué tomada en base al resultado de la evaluación y recomendaciones?
26. ¿Quién tomó la decisión final?
27. ¿Fué puesta la decisión en ejecución?
28. ¿Qué ministerios se unieron a la restauración?
29. ¿Qué está haciendo en estos momentos SE/CNDC?
30. ¿Cual és el actual progreso de la restauración?
31. ¿Donde se encuentran los refugiados ahora?
32. ¿Fué preparado un presupuesto especial para la ayuda y la restauración?
33. ¿Quién está a cargo de la preparación del presupuesto especial?
34. ¿Cual és el procedimiento necesario para la preparación del presupuesto especial?
35. ¿Cual fué finalmente el presupuesto?
36. ¿De qué clase de detalles consiste el presupuesto?
37. ¿Quién se encarga del presupuesto?
38. ¿Cual és el procedimiento necesario para usar el presupuesto?

Para Recolectar

- (I) Primer Reporte
- (II) Reportes más detallados
- (III) Evaluación de los reportes
- (IV) Un cuadro de la organización de la Defensa Civil para enfrentar el desastre del 9 de Marzo de 1987.

Investigation of Actions Taken Actually  
for Disaster on March 9, 1987

(Attachment to JPU-19)

Questions

1. Who informed the disaster to SE/CNDC?
2. When was the information given to SE/CNDC?
3. How was the information given to SE/CNDC?
4. Who got the information at SE/CNDC?
5. How did SE/CNDC handle the matter when the information was given to SE/CNDC?
6. Was the disaster investigation team organized?
7. Who organized the investigation team?
8. How was the composition of the team?  
(Concerned ministries and functions)
9. Was the first moment report prepared?
10. Who prepared the first moment report?
11. To whom was the first moment report given?
12. When was the first moment report prepared?  
(How many days after occurrence of disaster)
13. Who evaluated the first moment report?
14. How was the first moment report evaluated?
15. To whom was the evaluation result given?
16. What kinds of aids were given to the disaster area?
17. What kinds of ministries and functions joined the first aid?
18. When did the first aid arrive at the disaster area?
19. Was a more detailed report prepared?
20. Who prepared the more detailed report?
21. To whom was the more detailed report given?
22. Who evaluated the more detailed report?
23. To whom was the evaluation result given?
24. How was the evaluation result and recommendation?

25. What kind of decision was made based on the evaluation result and recommendation?
26. Who made the above decision?
27. Was the decision put into execution?
28. What kinds of ministries and functions join the r restoration?
29. What is SE/CNDC doing now?
30. How is the actual progress of restoration?
31. Where are the refugee now?
32. Was a special budget for the aids and restoration prepared?
33. Who is in charge of the preparation of special budget?
34. How is the procedure necessary for the preparation of special budget?
35. How much amount of budget was prepared finally?
36. What kinds of items does the budget consist of?
37. Who keeps the budget?
38. How is the necessary procedure to use the budget?

To be Collected

- (I) First moment report
- (II) More detailed reports
- (III) Evaluation reports
- (IV) A chart of organization actually taken for the disaster on March 9, 1987.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 16, 1987

Nº : JPU-20

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: River Survey

Dear Sir,

We would like to request you to prepare and send us the letter which explains the present progress of river survey as the results were not yet given to the JICA Study Team.

The following minutes of meeting and letters are available to review and confirm the situation.

- (1) Minutes of Meeting signed on Feb. 11, 1987
- (2) Our Letter JPU-08 dated Feb. 18, 1987
- (3) Our Letter JPU-11 dated March 9, 1987
- (4) Minutes of Meeting signed on March 27, 1987
- (5) Our Letter JPU-18 dated May 26, 1987

Plan and Specifications are attached.

It seems to be impossible to reflect the results of river survey on the study of disaster prevention plan if the results can not be given to the Study Team within this month.

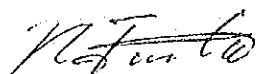
The specific reason and comments on the matter are requested to be described on the letter if you can not keep the official agreement between JICA and SE/CNDC.

(to be continued)

*Recibido  
17/6/87  
[Signature]*

We hope that you can follow and understand the matters described on this letter.

Sincerely Yours,



Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: CN AP Mario Ramírez (SE/CNDC)  
Ing. César Arguedas Madrid (SE/CNDC)  
May. EP Gerardo Pérez (IGN)  
May. FAP Vivar Gamarra (DGAF)

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 16, 1987

Nº : JPU-21

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Meteo-hydrological Data

Dear Sir,

We would like to request you to collect the additional meteo-hydrological data listed as follows:

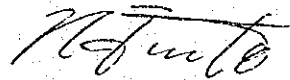
1. Instantaneous Peak Discharge (Monthly maximum) at Chosica, San Mateo and Rio Blanco gaging stations
2. River cross sections at the time of past discharge measurement at Chosica, San Mateo and Rio Blanco gaging stations.
3. Exact location of Chosica and San Mateo gaging stations on map of 1/5000.
4. Sediment data (Suspended load, bed load, total load and grain size distribution) in the Chillón, Lurin Mantaro river basins.
5. New edition of ONERN's report (prepared after 1975)
6. New edition of study reports published by SENAMHI or DHINA
7. Progress and schedule on the installation of meteo-hydrological apparatus
  - Pluviograph (automatic raingage) at Canchacalla Chaute, Casapalca and Autisha
  - Limnigraph (automatic water level gage) at Rio Suncha and downstream stretch of Pte. Piedra. X

*Recibido  
14/6/87  
JD*

8. Rainfall records in March 1987 (March 1 to March 15) at all the gaging stations in the Rimac river basin
9. Discharge records from March 1 to March 15, 1987 at all the gaging stations in the Rimac river basin.

Please prepare and send us the data listed above as early as possible in this month. The specific explanation will be made in the meeting between JICA Study Team and the counterparts concerned.

Sincerely Yours,



Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: CW AP Mario Ramirez (SE/CNDC)  
Ing. César Arguedas Madrid (SE/CNDC)  
Sr. Luis G. Brea Raik (SENAMHI)  
Ing. Walter Gómez (SENAMHI)  
Sr. Oscar Trejo (SE/CNDC)  
Ing. Nicolás Carrión (ELECTROLIMA)



THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 19, 1987

Nº : JPU-22

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Data for Socio-Economy and Project Evaluation

Dear Sir,

The data listed in the attachment are requested to be collected and sent us earlier within this month.

If you have some difficulty to prepare all the data within this month, you are requested to explain the situation by a letter at the beginning of July. It is suggested by us that Dr. Victor Murillo Pino is in charge of the data collection.

We would like to expect your understanding and assistance to our study.

Sincerely Yours,

*for* *Mokada*

Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CN AP Mario Ramirez (SE/CNDC)  
Ing. César Arquedas Madrid (SE/CNDC)  
Dr. Víctor Murillo Pino (SE/CNDC)

*[Signature]*  
ING. TABOADA MUÑOZ  
Secretario General (s) de la SE/CNDC

Attachment to Letter JPU-22

List of Data for Socio-Economy and Project Evaluation

<u>ITEM</u>	<u>INSTITUTION</u>
A. Benefit Study	
1. Inventory survey	
(a) Unit cost per m <sup>2</sup> and standard size by type of house	Ministry of Vivienda
(b) Unit cost per m <sup>2</sup> and standard size of a factory	Ministry of Industry
(c) Unit cost per m <sup>2</sup> and standard size of an ordinary building	
2. Indirect Benefit	
(a) Type and volume of consignment by railway from January to December in 1983 Total days during which a railway operation was interrupted at 1983 disaster	Empresa Nacional de Ferrocarriles
(b) Total days during which a road transportation was interrupted at 1983 disaster	Ministry of Transportation
3. Maintenance cost of recovering damaged infrastructure at 1983 disaster	
(a) Power station, outlet and other facilities	Electrolima
(b) Water supply facilities	Sedapal

(c) Railway

Empresa Nacional de  
Ferrocarriles

(d) Bridge

Ministry of Transportation

B. Socio-economic data covering  
the north part of HUAROCHIRI

-Chicla

-San Mateo

-Carampoma

-San Juan de Iris

-San Pedro de Casta

-San Mateo de Otao

-Matucana

-Surco

-San Bartolomé

-Sta. Cruz de Cocachaera

-Ricardo Palma

-Santa Eulalia

-San Antonio

These general data shall be  
collected by Mr. Murillo Pino

If an allowable time to  
collect these data are spared,  
please ask Mr. Murillo to  
visit Development Institution  
of Micro Region in Matucana.

General data are as follows:

- The number of houses in recent year.
- The number of house engaged in agricultural activity  
and tertiary activity.
- Average monthly household expenditure.
- Enrollment ratio from primary to junior high school.  
The number of schools, and of students.
- Electrification.
- Water supply connection rate.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 22, 1987

Nº : JPU-23

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Investigation for Water Law

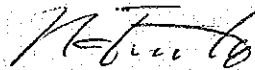
Dear Sir,

The study requires the investigations of water law  
in Perú.

The investigations consist of data collection and  
questions in relation to the Water law as given in the  
attached paper.

Your kind cooperation for the above will highly be  
appreciated, we are,

Sincerely Yours,

  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CNAP Mario Ramirez (SE/CNDC)  
Dr. Victor Murillo Pino (SE/CNDC)

## Investigation for Water Law

1. Following informations are obtained;

- Clause Nº 1 to Nº 19 of "Water Law" specify the principle to be applied for the ownership of river water, spring water, still water and groundwater, etc.
- Clause Nº 63 to Nº 75 of "Water Law" specify the measures for preventing from flood and drying up of river water.

Details of the above are required to be known. Thus, the Clause Nº 1 to Nº 19 and Nº 63 to Nº 75 of "Water Law" are requested to be collected.

2. "Consejo Superior de Aguas" was established based on Law Nº 8550 dated June 20, 1937.

How is the present situation of the above "Consejo Superior de Aguas"?

Which organization has the authority at present?

3. How is the administrative system at emergency such as the disaster in March 1987. A detailed organization chart including the regional system is requested to be prepared.

4. An Organic Law on Marginal District (Ley Orgánica de Barrios Marginales) was enacted by Law 13,517 of February 14, 1961. Details of the above law are requested to be obtained.

5. What is the executive organization of the above Organic Law on Marginal District?

6. How is the above law applied actually for the slum in or near the river.

7. In the case that the illegal occupation of lands will be prohibited due to a high possibility of disaster,  
- Is the prohibition possible with the present law?  
- Is the enactment of new law necessary?

8. Does the Government have a plan to remove the existing slum in or near the river as well as some construction of new houses for migration?

Team  
Office

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

Lima, 23 de Junio de 1987

Señor Doctor  
JORGE DEL CASTILLO GALVEZ  
Alcalde del Concejo Provincial  
de Lima

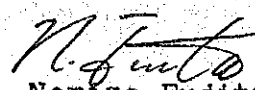
ASUNTO: Lista de Técnicos de la JICA para el estudio  
de Prevención de Desastres en la Cuenca del  
Río Rímac.

Señor Alcalde:

Tengo el agrado de dirigirme a usted para poner  
en su conocimiento la Lista de Técnicos que están  
laborando para el Plan Maestro de Prevención de Desas-  
tres en la Cuenca del Río Rímac, mediante el convenio  
suscrito entre los Gobiernos de Perú y Japón son los  
siguientes:

- |                  |   |
|------------------|---|
| Ryuzo Nishikawa  | Jefe del Equipo Técnico                     |
| Norizo Fujita    | Sub-Jefe del Equipo Técnico                 |
| Hiroshi Okada    | Planificación de Prevención<br>de Desastres |
| Yoshihiro Motoki | Hidrólogo                                   |
| Mamoru Suzuki    | Geólogo                                     |
| Masaaki Sakurai  | Evaluación de Desastres                     |
| Shohei Ezaki     | Diseño de Infraestructura                   |
| Hiroshi Onodera  | Evaluación de Costos de<br>Construcción     |
| Munenori Tada    | Socio-Economista                            |

Atentamente,

  
Norizo Fujita  
Jefe encargado del equipo  
de JICA

c/c Arq. Luis Tagle Pizarro

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 26, 1987

Nº : JPU-24

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: River Survey

Dear Sir,

Though we recieved your letter (Nº067) dated June 24, your explanation on the river survey is still not definite.

As we already requested you, the following matters have to be written in the letter.

- (1) The reason why you didn't carry out the river survey.
- (2) The definite time schedule of river survey if you still have intention to do the survey. When the results will be given to the Study Team?
- (3) The method of river survey. It seems to be difficult to take the aerophotographs in this cloudy season.

Please consider the study schedule of master plan for disaster prevention of the Rimac river basin. It is difficult to sufficiently use the results of river survey for the master plan study if we can't get them before our leaving from Lima, July 7, as we already informed you. However, it seems that the results can be more or less used later for confirming or revising the study

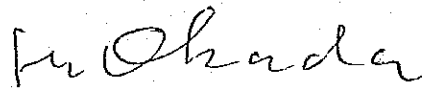
(to be continued)

based on the results of river survey carried out in or around 1981, even if we get the river survey results after the middle of July.

This letter was prepared for the reference to the meeting which is scheduled to be held on next Tuesday or Wednesday.

Your written information, the additional letter to your letter (Nº067), is requested to be send us earlier in the next week.

Sincerely Yours,



for

Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: CN AP Mario Ramírez (SE/CNDC)  
Ing. César Arguedas Madrid (SE/CNDC)  
May. EP Gerardo Pérez (IGN)  
May. FAP Vivar Gamarra (DGAF)



THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: June 30, 1987

No : JPU-<sup>25</sup>~~24~~

Calm. Jorge A. Del Aguila Sánchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Lecture

Dear Sir,

As a part of technology transfer activities, we would like to provide some lectures to the Peruvian Counterparts for the Rimac river disaster prevention study in accordance with the schedule described as follows:

1. Date : July 6, 1987 (Monday)
2. Time : AM 9:00+ - 12:00
3. Place : To be informed by Mr. Arguedas
4. Subject:
  - (1) Mechanism of Natural Disaster, by M. Suzuki
  - (2) Brief Introduction of Measures against Landslides, slope failures, debris flow and Mud flow, by H. Okada
  - (3) Basic Conditions for Construction Plan and Cost Estimate, by H. Onodera
  - (4) Disaster Survey (Debris and Mud flow in Japan), by M. Sakurai+ Attendants have to come to the room before 9:00.

You are requested to inform this matter to all the counterparts listed in the attached paper and inform us the expected number of attendants.

Sincerely Yours,

D.S.

*[Handwritten signature]*  
20/6/87

*[Handwritten signature]*  
30 June 87

*[Handwritten signature]*  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)

Attachment to JPU-25

List of Peruvian Counterparts

- (1) Dirección General
- Calm. AP. Jorge Del Aguila Sánchez SE/CNDC
  - Ing. César Arquedas Madrid SE/CNDC
  - Arq. Lenkiza Angulo Villarreal SE/CNDC
  - Ing. Guillermo Chamorro Rodríguez SE/CNDC
- (2) Prevención de Desastres
- Ing. Guillermo Chamorro Rodríguez SE/CNDCa
  - Arq. Enrique Huiza Valverde SE/CNDC
  - Ing. Germán Reátegui Orbe U.N.M.S.M.  
(Coordinador-Secretario)
- (3) Hidrometeorología e Hidráulica
- Ing. Filiberto Matos Flores DHINA
  - Ing. Jorge Lam Ramírez DHINA
  - Cap. Corb. RP. César Del Carmen DHINA
  - Ing. Nicolás Carrión ELECTROLIMA
  - Ing. José Córdova SEDAPAL
  - Ing. Brea SENAMHI
  - Planif. Oscar Trejo Oviedo SE/CNDC  
(Coordinador)
- (4) Topografía y Geología
- May. EP Gerardo Pérez I.G.N.
  - Ing. Gonzáles INGEMMET
  - May. FAP Vivar Gamarra DIGAF
  
  - Ing. César A. Benites Chunga DGASI
- (5) Investigación de Desastres
- Ing. Juan De la Cruz U.N.M.S.M.
  - Ing. Hernán Cabanillas S. II RDC  
U.N.M.S.M.

(6) Plan y Diseño de Estructuras

- Ing. Pedro Quevedo

Privado Espec.  
Obras Hidraul.

- Ing. Jorge Lam Ramirez

DHINA

- Ing. Filiberto Matos F.

DHINA

- Ing. Edmundo Turpaud

Minist. Agricul.

- Ing. Angel Lema

CORLIMA

- Ing. Fernando Moreno

COOPOP

- Arq. Lenkiza Angulo V.  
(Coordinadora)

SE/CNDC

(7) Planes de Construcción y Estimación de Costos

- Ing. Juan Medina

Minist. Vivien.

- Ing. Benjamín Villanueva N.

Minist. Transp.

- Arq. Máximo Fuentes

Minist. Agric.

- Bach. Luis Pedro Abad Veliz

CORLIMA

- Ing. Luis Cabrera López  
(Coordinador-Secretario)

SE/CNDC

(8) Sociedad, Economía y Otros

- Dr. Victor Murillo Pino

SE/CNDC

- Asist. Social Elizabeth Mayhua

SE/CNDC

LECTURES BY JICA STUDY TEAM

July 06, 1987

The JICA Study Team for the Rimac river disaster prevention project lectures to the Peruvian counterparts on the following subjects and contents.

1. Mechanism of Natural Disaster by Mr. M. Suzuki

(1) Examples of Natural disaster in Japan

- (a) Landslides
- (b) Slope failure
- (c) Debris/Mud flow

Note: The explanation will be done by using slides.

(2) Disaster in the Rimac river basin

- (a) Landslides and Slope failure
- (b) Mechanism of Debris flow on alluvial fan
- (c) Mechanism of Inundation

(3) Meteorological conditions and Erosion

2. Brief Introduction of Measures against Landslides, Slope failure, and Debris/Mud flow by Mr. H. Okada.

(1) Non-Structural Measures

(A) To be taken before disaster

Damage susceptibility is modified by the following methods.

- (a) Removal/relocation of houses and infrastructures
- (b) Land use regulation
- (c) Damage proofing houses and structures
- (d) Zoning of dangerous areas
- (e) Construction regulation
- (f) Disaster forecasting

(B) To be taken at the time of disaster

Damage will be reduced by the following activities

(a) Disaster Warning

(b) Evacuation

(c) Disaster fighting

The system of above activities is to be established before the disaster

(C) To be taken after disaster

Damage relief works will be accelerated by the following aids.

(a) Monetary aid

(b) Material aid

(c) Spiritual aid

(d) Medical aid

(e) Guidance to relife

(f) Rehabilitation works of disaster area

(2) Structural Measures

(A) Against Landslides

(a) Surface water drainage

(b) Ground water drainage

(c) Excavation

(d) Counter embankment

(e) River structures

(f) Piling Work

(g) Large diameter cylinder pile

(h) Anchor Works

(i) Retaining wall

(j) Others

- (B) Against Slope failure
  - (a) Surface water drainage
  - (b) Around water drainage
  - (c) Vegetation
  - (d) Surface protection works
  - (e) Ground improvement works
  - (f) Excavation
  - (g) Retaining wall
  - (h) Crib works
  - (i) Anchor works
  - (j) Counter embankment
  - (k) Others
- (C) Against Debris/Mud flow
  - (a) Hill side works
  - (b) Dam
  - (c) Channel works
  - (d) Revetment
  - (e) Ground sill
  - (f) Sand arresting works
  - (g) Others

3. Basic Conditions for Construction Plan and Cost Estimate

by Mr. H. Onodera

- (1) Scope of work
- (2) Construction Method
  - (a) Basic Condition
  - (b) Schedule
  - (c) Construction method
- (3) Construction cost estimate
  - (A) Basic Condition
  - (B) Constitution

- (a) Direct Cost
- (b) Indirect Cost
- (c) Price Contingency

4. Disaster Survey (Debris and Mud flow in Japan) by Mr.  
M. Sakurai

(1) Debris and Mud flow in Japan

(A) Characteristics of Debris and Mud Flow

(B) Classification

(a) Debris flow type

(b) Mud flow type

(2) Survey on Debris and Mud Flow

(A) Objectives and Methods

(a) Hearing from inhabitants

(b) Collection of data

(c) Analysis of topographical maps and aerial  
photographs

(d) Field survey

(B) Survey Items

(a) Natural conditions such as topography, geology  
vegetation and land utilization

(b) Conditions of occurrence; location, time, cause  
rainfall, discharge, etc.

(c) Conditions of movement; area division of  
occurrence, transportation and deposit, etc.

(d) Conditions of Damage

(e) Conditions of evacuation and relief activity

(f) Existing structures

(g) Conditions for selecting countermeasures

(C) Past Disaster

(3) Observation of Debris and Mud Flow

(a) Establishment of meteo-hydrological instruments  
(rainfall and discharge)



(b) Establishment of debris flow observation instruments

(c) Field measurement (periodical)

(d) Test construction of structures

(4) Projection of Slides (Debris and Mud Flow in Japan)



*file*

THE MASTER PLAN STUDY ON THE DISASTER PREVENION  
PROJET IN THE RIMAC RIVER BASIN JAPAN INTERNATIONAL  
COOPERATION AGENCY.

Date: September 14, 1987  
No JPU-27

Calm. JORGE DEL AGUILLA SANCHEZ  
Director Superior del Comité  
Nacional de Defensa Civil

Re : Discussion on "Interim Report"

Dear Sir,

We are pleased to submit you four (4) copies of the Report entitled "Interim Report for the master Plan Study on the disaster prevention projet in the Rimac River basin".

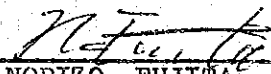
The said Report consists of two (2) volumes and is prepared in the form of a draft.

You are requested to review the Report whitin a limited short period as the official meeting for discussion on the Report between the Study Team and the Peruvian counterparts is scheduled to be held on September 18 (Friday) or 21 (Monday). The difinite time and place will be decided on September 15 (tomorrow)

The Study Team will welcome any questions and comments from your side at any time during our stay in Lima.

Your understanding and cooperation on this matter will be much appreciated.

Sincerely yours,

  
NORIZO FUJITA  
Acting Team Leader  
JICA STUDY TEAM

C.C.  
-C.N. AP. Mario Ramirez  
-Ing. César Arguedas M.

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: Sept. 18, 1987  
N° : JPU-28

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comite  
Nacional de Defensa Civil

Subject: Vehicles and Drivers for the Study Team

Dear Sir,

We would like to request you the arrangement of vehicles  
(Provided by JICA) and drivers for the Study Team as follows:

1. Use of Vehicles
  - Weekday 2 Vehicles
  - Saturday and Sunday 1 or 2 Vehicles
  - Special case (to be informed) 3 Vehicles
2. Driver

Two drivers exclusively for the Study Team are requested to be nominated. In case that the driver nominated is off his duty another driver should be substituted.
3. Working hour of driver
  - (1) Start Time
    - Weekday To come and stand by at the Pension by 8:30 AM.
    - Saturday and Sunday To be informed directly to the driver(s) beforehand (on Friday).
  - (2) Finish Time

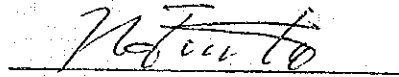
The time when the Study Team informs the driver that he may finish the work. The driver is requested to stay until getting permission of the Study Team.
  - (3) Overtime

The Study Team will pay allowance to the drivers for working after 4:00 PM on weekday and for working on Saturday and Sunday.

It will be much more convenient to us if we can manage the drivers by ourselves.

Your kind understanding and prompt action on the matter above will be highly appreciated, we remain.

Sincerely Yours,



Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)  
Sr. Chiclayo (SE/CNDC)

*Recibido  
15/9/87  
Fujita*

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: Sept. 18, 1987  
No. : JPU-29

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comite  
Nacional de Defensa Civil

Subject: Intallation of Automatic Raingages and Water  
Level Gages.

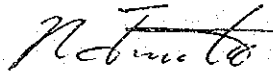
Dear Sir,

According to the letter submitted from Ing. Otto Ramos, Director General of Operation in SENAMHI, to the chief of SENAMHI dated on June 30, 1987 (No. 072/OGO), the intallation of automatical raingages and water level gages would be carried out in July and August this year. However, it seems that the installation work is not completed yet as scheduled.

You are kindly requested to inform us within this month the present progress and definite schedule of the installation works by SENAMHI.

Your kind understanding and prompt action on the matter above will be highly appreciated, we remain.

Sincerely Yours,



Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)  
Ing. Walter Gomez L. (SENAMHI)

*Ruiz  
18/9/87  
[Signature]*

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date : Sept. 24, 1987  
N° : JPU-30

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Confirmation of CNDC's Opinion on the Proposed  
Organization in Non-Structural Measures.

Dear Sir,

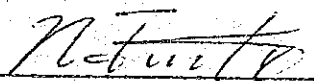
The draft Interim Report of the captioned study proposes some organizations for the land use regulation, river management or emergency disaster relief.

We would like to confirm CNDC's opinions on the proposed organization to avoid any troubles to CNDC or the Government of Peru.

The attached papers provided the matters for which CNDC's opinions are requested.

Your kind understanding and prompt reply for the matter will highly be appreciated, we remain,

Sincerely Yours,

  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)

### Confirmation of CNDC's Opinions

- (1) Proposed organization to execute the land use regulation in dangerous area and river management:

The attached Fig.-A shows an example of the organization for land use regulation in the dangerous areas and river management, which is prepared referring to the organization in Japan as seen in the attached Fig.-B.

- (a) In Fig.-A the name of ministry is not shown. CNDC's opinion is requested whether or not the name (for example; "Ministry of Interior:") should be given.
- (b) CNDC's opinion is requested whether or not the Province Governor is suitable for the control of tributaries.
- (c) Any other opinions concerning with the organization, if any, are requested.

- (2) Proposed organization to execute the structural measures for disaster prevention:

Fig.-A also shows an example of the organization to execute the structural measures for disaster prevention. In Japan, the disaster prevention works are carried out under the supervision of the Ministry of Construction.

- (a) In Fig.-A, the name of ministry is not shown. CNDC's opinion is requested whether or not the name of ministry should be given.
- (b) If CNDC has any opinion or idea for the organization, kindly inform us of it.

- (3) Proposed organization for emergency disaster relief:

The attached Fig.-C shows an example of the organization for the emergency disaster relief, which is prepared referring to that in Japan.

- (a) It is proposed in the organization that CNDC will work as the main Emergency Operation Center. CNDC's opinion is requested whether this position of CNDC is proper or not.
- (b) Kindly check the instruction procedure shown in Fig.-C whether the proposed one causes any trouble or not.
- (c) If CNDC has any opinion or idea for the organization, kindly show it to us.
- (d) The draft Interim Report provides the following statements;

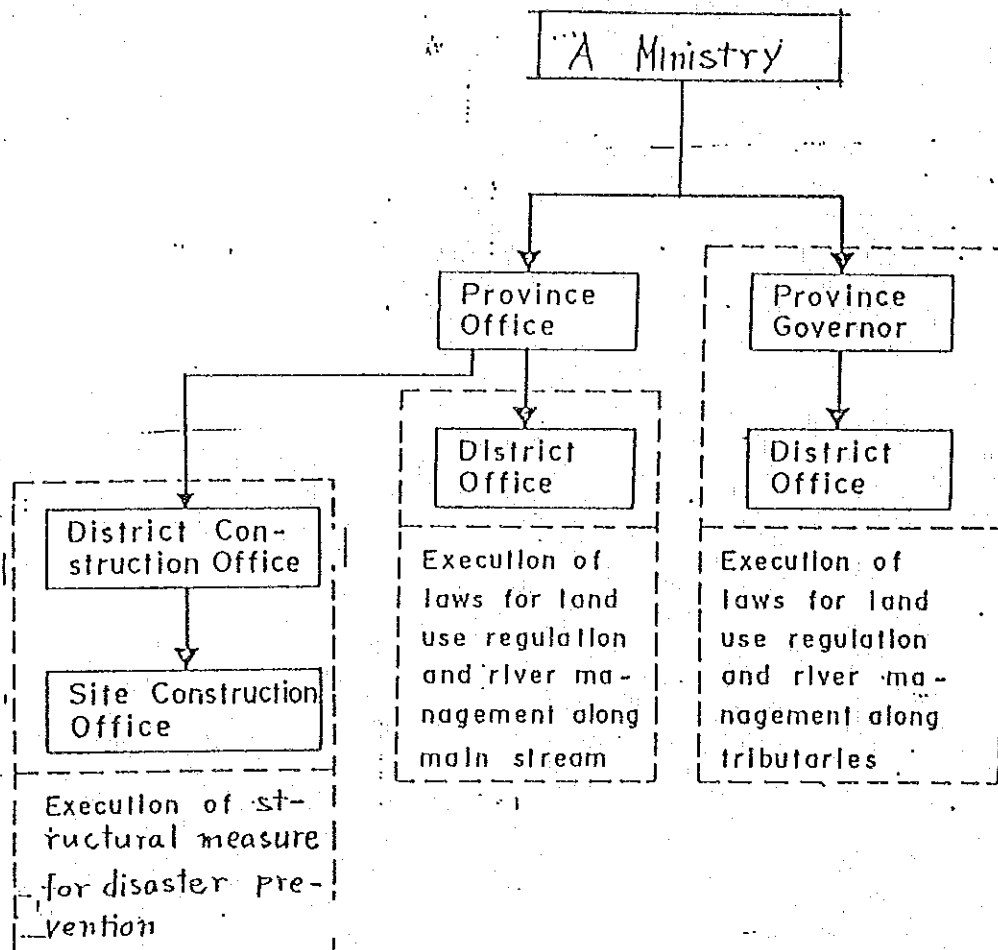


"At present, a systematic relief system in a national level is not established yet in Peru, making a prompt action essential at emergency difficult.

As such, in the event that the large disaster occurred in March 1987, a disaster relief system was tentatively organized. It took much time to organize the above relief system, resulting in no immediate and sufficient support to the disaster areas at the emergency."

Then, the Report stresses the necessity of the establishment of a systematic nationwide organization at emergency.

Kindly examine the above statements whether the statements cause any inconvenience to the Government of Peru or not.



- A  
 Fig. ~~VI-24~~ An Example of Organization Chart for Land Use Regulation, River Management and Implementation of Structural Measures for Disaster Prevention

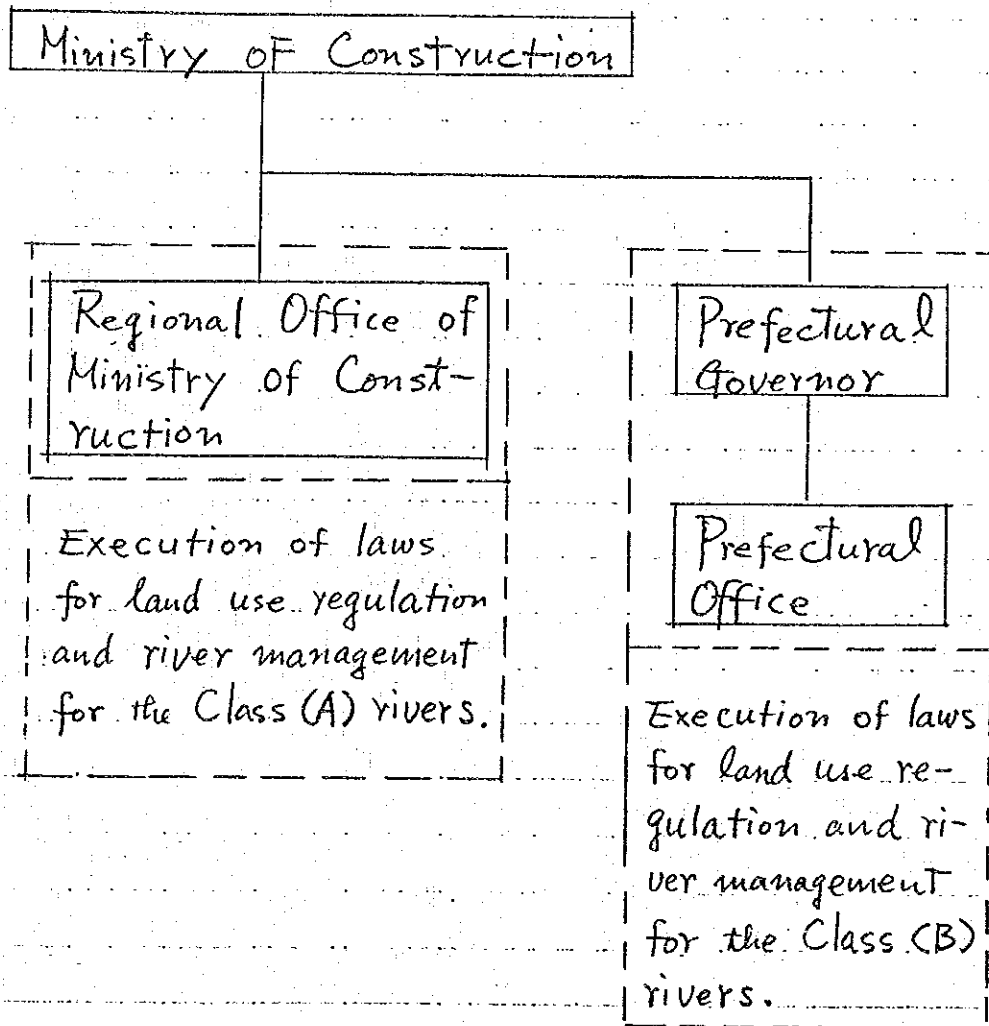
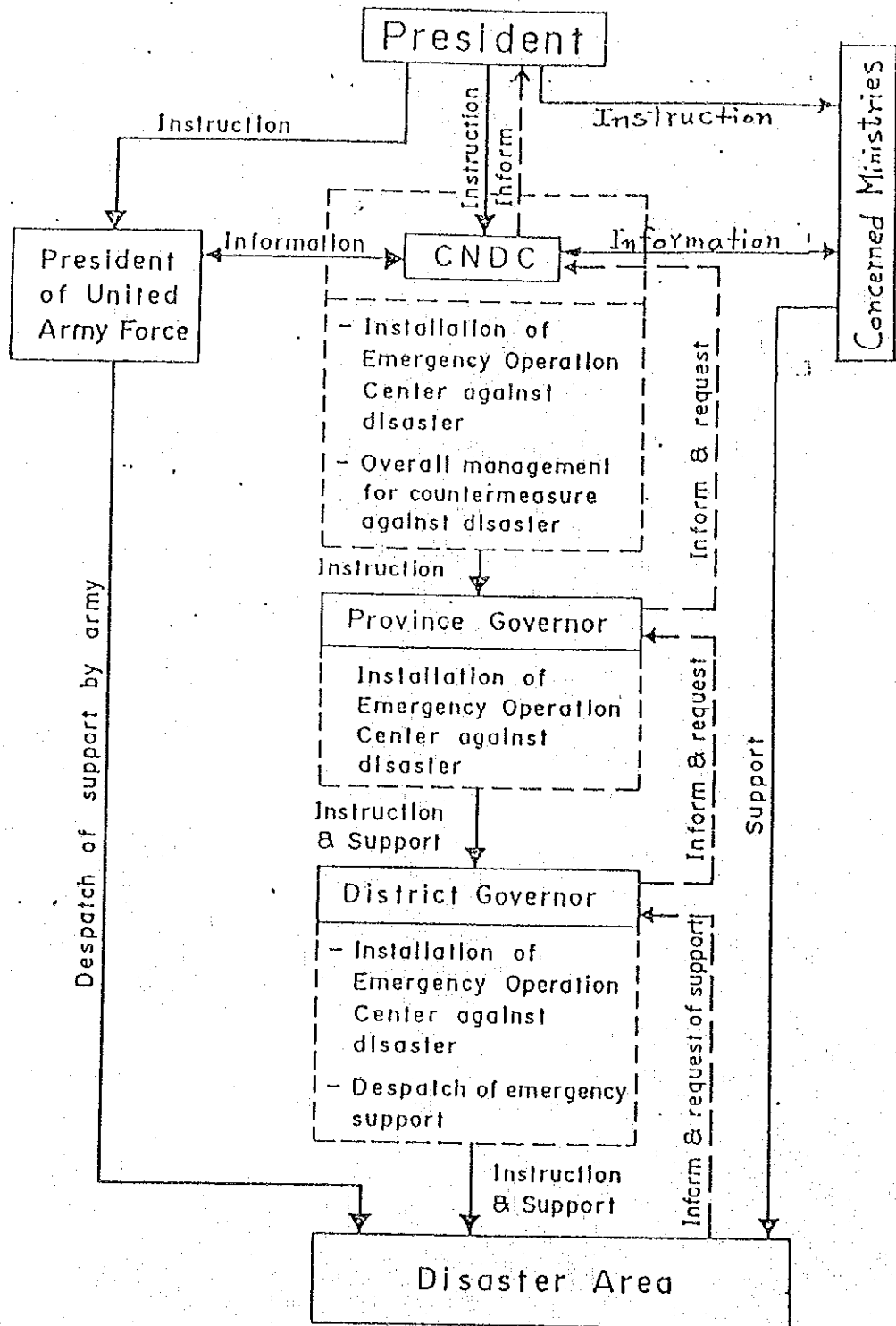


Fig. -B : ORGANIZATION FOR RIVER MANAGEMENT IN JAPAN



- C  
 Fig. ~~XV-2-2~~ An Example of Organization Chart for Emergency Disaster Relief

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date : Sept. 25, 1987

N° : JPU-31

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Confirmation of the Schedule for Final Discussion on  
the Draft Interim Report

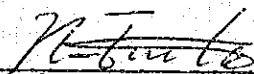
Dear Sir,

We would like to herewith confirm the schedule for final discussion on the Draft Interim Report and request you the arrangement of meeting for the discussion as follows:

- (1) The discussion is scheduled to be made from AM 10:00 o'clock on Oct. 2, 1987. Then, you are kindly requested to inform all the concerned parties and counterparts of the schedule. The preparation of the place for meeting is also requested.
- (2) The discussion will be made mainly on the comments issued from the Government of Peru. Then, you are kindly requested to prepare and summarize the comments at the earliest so that the Study Team can receive the comments on Oct. 28, 1987 at latest.

Your kind attention and arrangement for the above will highly be appreciated, we are,

Sincerely Yours,

  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: Sept. 28, 1987

N° : JPU-32

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comitè  
Nacional de Defensa Civil

Re: River Survey Work for the Upstream Reaches of Chosica

Dear Sir,

Immediately after our arrival at Peru, we confirmed the progress of the above captioned work. At that time, CNDC informed us that the work is in progress and that the Study Team can receive the survey result for Chosica to Matucana at least before the Team will leave for Japan.

However, according to the information obtained on September 28, 1987, the work was suspended on the way due to a shortage of budget. The Team seriously worries that he cannot receive any survey result before leaving for Japan, making it impossible to incorporate it into the study.

Such being the case, you are strongly requested to solve the problem and to resume the work immediately so that the survey result can be received by the end of October, 1987 at latest. Otherwise, the study cannot incorporate the survey result at length, resulting in the nonfulfillment of agreement between the Governments.

Your kind attention and prompt action for the matter will be much appreciated, we are,

Sincerely Yours,



*Recibido  
29/9/87*

*N. Fujita*  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas Madrid (SE/CNDC)

*10.12.87*

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: Sept. 29. 1987  
N° : JPU-33

To: Calm. Jorge A. Del Aguila S.  
Director Superior del Comite  
Nacional de Defensa Civil

Subject: Installation of Automatic Raingages and Water Level  
Gages.

Ref. : Our letter N° JPU-29 (Sept. 18, 1987)

Dear Sir,

We would like to issue our opinion herein to you on the installation work of automatic raingages and water level gages newly provided by JICA.

According to the verbal information from SENAMHI, the installation has been completed at the respective locations within September. However, some of them where SENAMHI installed the gages are different from our instruction given in the Progress Report in March this year as follows.

<u>Installation by SENAMHI</u>	<u>Our Recommendation</u>
<u>Automatic raingage (Purviograph)</u>	
Chaute Casapalca Canchacalla Sheque	Chaute Casapalca Canchacalla Autisha
<u>Water level gage (Limnigraph)</u>	
Pte. Ferrocarril* Chosica**	Rio Suncha Pte. Piedra (Lima)

\*, Crossing the Rimac river at around 2km upstream from La Atarjea intake

\*\* , Substituted the present equipment by the new one at present station.

(1) Automatic raingage

As seen in above among provided four gages, three were installed as instructed, but another one was installed at Seque not at Auticha where is location recommended. We recommended Autisha because calibration of the new gage can be made by means of the existing purviometro. Further, SENAMHI insisted to install it at this site.

Through a discussion with an engineer of SENAMHI, we understood that they intend to study the correlation of rainfall between at most upstream and at middle stream areas of the Santa Eulalia river. Sheque was selected in this purpose. We accepted that Autisha was substituted by Sheque.

(2) Water Level Gage

We recommended to install the new gages at just upstream of the confluence with Rio Suncha in the Santa Eulalia river and at downstream side of Pte. Piedra in the Rimac river. The location in Rio Suncha was recommended in order to obtain basic data to study the relationship between rainfall and runoff in the upstream basin in the Santa Eulalia river. It was considered that operation and maintenance of the station would be comparatively easy because the site is only around 20m away from the main road. On the other hand, the site in Lima near Pte. Piedra was recommended because no station for observation of water level exists in Lima. It is essentially required to examine flood discharge quantity by means of the observed record at an appropriate location in Lima.


On the contrary to our recommendation above, SENAMHI installed a new gage at Pte. Ferrocarril and exchange to the new equipment instead of the existing one at the present gaging station in Chosica.

Besides the raingages and water level gages, SENAMHI installed staff gages at Pte. Los Desocupados and at Matucana which were also provided by JICA as well as other equipments. Pte. Los Desocupados in the Santa Eulalia river is located at around 2Km upstream of the confluence of the Rimac river with the Santa Eulalia river. In addition SENAMHI already installed a staff gage at Pte. Santa Rosa in Lima.

SENAMHI mentioned the reason why the site was not selected is that the site at Rio Suncha could be easily damaged by a stranger because it can be easily seen from the road. As for the equipment taken off at the present station in Chosica, SENAMHI intend to install it at other site near the present station in Chosica also. We wish to recommend to install it at the Pte. Los Desocupados where the staff gage was set. The location where is just upstream of the Santa Eulalia river is preferable to observe the discharge quantity from the Santa Eulalia river before joining to the Rimac river.

In order to study the flood discharge in Lima the staff gage at Pte. Santa Rosa will be available. Thus, it is required to continue the observation of flood discharge constantly.

Sincerely Yours,

  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc.: CN AP Mario Ramirez (SE/CNDC)  
Ing. Cesar Arguedas (SE/CNDC)  
Ing. Walter Gomez (SENAMHI)



THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date: Oct. 7, 1987  
N° : JPU-34

Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comité  
Nacional de Defensa Civil

Re: Submission of Interim Report

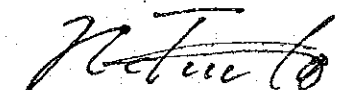
We are pleased to submit you herewith twenty (20) sets of the Interim Report for the Master Plan Study on the Disaster Prevention Project in the Rimac River Basin.

However, it is informed that some figures showing the structural plan in Quebrada area will be required to be replaced later.

Therefore, the actual submission will be done through JICA Lima office at the end of this month after replacing a part of the said Report.

Your kind understanding is highly appreciated.

Truly Yours,



Norizo Fujita  
Acting Team Leader  
JICA Study Team

c.c.: JICA Lima office

THE MASTER PLAN STUDY ON THE DISASTER  
PREVENTION PROJECT IN THE RIMAC RIVER BASIN  
JAPAN INTERNATIONAL COOPERATION AGENCY

Date : Oct. 26, 1987  
Nº : JPU-35

To: Calm. Jorge A. Del Aguila Sanchez  
Director Superior del Comite  
Nacional de Defensa Civil

Subject: Handing Over the Interim Report

Ref.: Our letter Nº JPU-35 (Oct. 7, 1987)

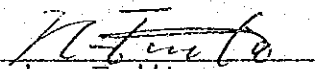
Dear Sir,

Reference is made to our letter No. JPU-35 dated October 7, 1987 saying that twenty (20) sets of the Interim Report of the captioned study will be handed over to you after necessary revisions and replacement of structural plans shown in the Report.

We are pleased to herewith forward to you twenty (20) sets of the Report in which the revision has duly been made.

Your kind attention to the matter will highly be appreciated, we are,

Sincerely yours,

  
Norizo Fujita  
Acting Team Leader  
JICA Study Team

cc: JICA Lima Office  
JICA Tokyo