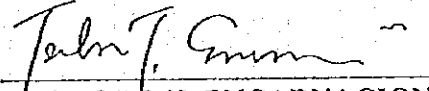
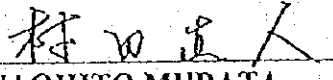
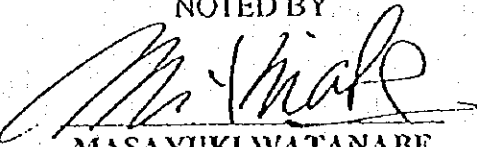


ANNEX

MINUTES OF DISCUSSIONS
ON
INCEPTION REPORT
FOR
THE STUDY ON SABO AND FLOOD CONTROL
IN THE LAOAG RIVER BASIN
IN
THE REPUBLIC OF THE PHILIPPINES
AGREED UPON BETWEEN
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY


TEODORO T. ENCARNACION
Undersecretary
Department of Public Works and
Highways


NAOHITO MURATA
Team Leader
JICA Study Team

NOTED BY

MASAYUKI WATANABE
Chairman of Advisory Committee
Japan International Cooperation Agency

In accordance with the scope of work for "the Study on Sabo and Flood Control in the Laoag River Basin" agreed upon between Department of Public Works and Highways (hereinafter referred as to "DPWH") and Japan International Cooperation Agency (hereinafter referred as to "JICA"), the JICA Study Team submitted thirty(30) copies of the Inception Report to DPWH on March 25, 1996.

The first joint meeting of DPWH and JICA Study Team was held on March 26, 1996 at the conference room of DPWH Central Office. The meeting was presided by Mr. Teodoro T. Encarnacion, Undersecretary, DPWH. He thanked all the participants for attending the meeting as listed on the attached sheet.

He ended his opening remarks by requesting all the members in attendance to discuss the Inception Report which was submitted by the JICA Study Team. Following the opening remarks, Mr. Naohito Murata, Team Leader of the JICA Study Team, presented the contents of the Inception Report.

The following major issues were raised and discussed by the parties in attendance during the course of the meeting.

(1) The DPWH accepted the Inception Report in principle. Detailed technical comments, if any, will be transmitted to the Study Team to be reflected in the course of the Study.

(2) Suitable office space with furniture and utilities will be provided by the DPWH for the JICA Study Team in both Laoag and Manila.

1) The office use period is tentatively scheduled as follows;

Laoag Office : First four(4) months of the first field work,
Two(2) months of the second field work, and
One(1) month of the third field work.

Manila Office : Remaining two(2) months of the first field work, and
Two(2) months of the third field work.

2) The DPWH will complete the arrangement of the Laoag Office by the end of this month.

N

AB J (H) Jh.

3) The DPWH will provide the Manila Office by June, 1996.

(3) In accordance with the minutes of discussions held on November 29, 1995, the Steering Committee under the coordination of the DPWH will be established as soon as possible. The Committee will be comprised of the representatives of the DPWH and other agencies and organizations concerned.

(4) The DPWH will assign the following counterparts for the Study;

In Laoag : Mr. Rolando H. Tamayo, District Engineer, and about five(5) others.

In Manila : Mr. Resito V. David, Deputy Project Manager, PMO-MFCP, and about eight(8) others.

(5) Two seminars for technology transfer will be conducted during the fourth field work in 1997, one is in Laoag City and the other is in Manila.

Mr. Encarnacion delivered his closing remarks and likewise thanked all the members for their attendance.

Meeting started - 08:00a.m.

Meeting adjourned - 10:00a.m.

LIST OF ATTENDANTS

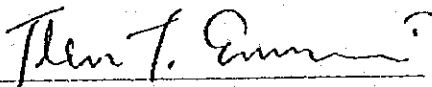
Philippine Side

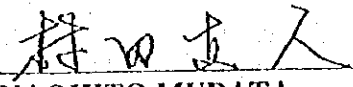
- DPWH
Mr. Teodoro T. Encarnacion Undersecretary
- DPWH-PMO-MFCP
Mr. Bernardo P. Aman Assistant of Director Ibrahim
Mr. Resito V. David Deputy Project Manager
- DPWH-Planning Service
Mr. Manuel S. Alcomis Engineer V-PED
- DPWH-BOD
Mrs. Sophia Santiago Engineer V, Hydraulic Division
Mr. Bienvenido C. Leuterio Represented by Mrs. Sophia Santiago
- DPWH-Region I
Mr. Manuel C. Parpana, Jr. OIC-ARD
- DPWH-INED
Mr. Rolando H. Tamayo Laoag-DO
- DPWH-JICA
Mr. Yoshiki Nagai JICA Sabo Expert

Japanese Side

- JICA Advisory Committee
Mr. Masayuki Watanabe Chairman of Advisory Committee, JICA
- JICA Tokyo Headquarters
Mr. Kiyoshi Masumoto Deputy Director of Environment, WID and Other
Global Issues Div., Planning Dept., JICA
- JICA Study Team
Mr. Naohito Murata Team Leader, JICA Study Team
Mr. Kanchiro Morishita Assistant Team Leader, JICA Study Team
Mr. Masahiro Isomura Land Use Planner/Environmentalist, JICA Study
Team
Mr. Antonio A. Alpasan Institutional Expert, JICA Study Team

MINUTES OF DISCUSSIONS
ON
PROGRESS REPORT (I)
FOR
THE STUDY ON SABO AND FLOOD CONTROL
IN THE LAOAG RIVER BASIN
IN
THE REPUBLIC OF THE PHILIPPINES
AGREED UPON BETWEEN
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY


TEODORO T. ENCARNACION
Undersecretary
Department of Public Works and
Highways


NAOIITO MURATA
Team Leader
JICA Study Team

In accordance with the scope of work for "the Study on Sabo and Flood Control in the Laoag River Basin" agreed upon between Department of Public Works and Highways (hereinafter referred as to "DPWH") and Japan International Cooperation Agency (hereinafter referred as to "JICA"), the JICA Study Team submitted thirty(30) copies of the Progress Report (1) to DPWH on September 16, 1996.

The second joint meeting of DPWH and JICA Study Team was held on September 16, 1996 at the conference room of DPWH Central Office. The meeting was presided by Mr. Teodoro T. Encarnacion, Undersecretary, DPWH. He thanked all the participants for attending the meeting as listed on the attached sheet.

He read over the discussion results of the preceding presentation held in Laoag City on September 13, as attached in appendix. He ended his opening remarks by requesting all the members in attendance to discuss the Progress Report (1) which was submitted by the JICA Study Team. Following the opening remarks, Mr. Naohito Murata, Team Leader of the JICA Study Team, presented the contents of the Progress Report (1).

The following major issues were raised and discussed by the parties in attendance during the course of the meeting.

- (1) The DPWH accepted the Progress Report (1) in principle.
- (2) A question was raised as to the reason why the whole area of Laoag City is not included in the Study area. Mr. Murata replied that the Study area is limited to the Laoag River basin as mentioned in the implementation arrangement agreed upon between DPWH and JICA, in November 1995. Furthermore, the San Mateo River directly drains rain water from the remaining part of Laoag City to the South China Sea.
- (3) A request was raised as to execution of the hydraulic experimentation or simulation model to verify the design sedimentation slope and volume adopted to the proposed sabo dams. Mr. Murata replied those detailed investigation should be made in the detailed design stage, if necessary.

Mr. Encarnacion delivered his closing remarks and likewise thanked all the members for their attendance.

Meeting started - 09:00 A.M.

Meeting adjourned - 10:30 A.M.

MEMBER OF STEERING COMMITTEE

Chairman

Teodoro T. Encarnacion
Undersecretary
Department of Public Works and Highways

Vice Chairman

Manuel M. Bonoan
Assistant Secretary for Planning, DPWH

Member

1. Bienvenido C. Leuterio
Director - Bureau of Design, DPWH
2. Ernesto M. Hernandez
Director - DPWH - Region I
3. Nonito F. Fano
OIC - Project Director - PMO-Major Flood Control Projects
DPWH

MEMBER OF TECHNICAL WORKING GROUP

Chairman

Resito V. David
Project Manager I, PMO-Major Flood Control Projects
DPWH

Member

1. Rolando H. Tamayo
District Engineer, 1st Ilocos Norte Engineering District
DPWH, Laoag City
2. Rizal V. Ruiz
2nd Ilocos Norte Engineering District, DPWH
San Nicolas, Ilocos Norte
3. Sofia T. Santiago
Engineer V, Bureau of Design, DPWH
4. Manuel S. Alconis
Engineer V, Planning Service, DPWH

LIST OF ATTENDANCE

Philippine Side

- DPWH
Mr. Teodoro T. Encarnacion Undersecretary
- DPWH-Region I
Mr. Ernesto M. Hernandez Director
- DPWH-PMO-MFCP
Mr. Nonito F. Fano Director
Mr. Resito V. David Project Manager I
- DPWH-Planning Service
Mr. Manuel S. Alconis Engineer V-PED
- DPWH-INED
Mr. Rizal V. Ruiz Project Manager II
- DPWH-JICA
Mr. Yoshiki Nagai JICA Sabo Expert

Japanese Side

- JICA Study Team
Mr. Naohito Murata Team Leader
Mr. Kanehiro Morishita Assistant Team Leader
Mr. Yuzou Mizota Hydrologist
Mr. Akio Shichijugari Structural Engineer/Construction Planner
Mr. Tatsuo Tashino Socio-economist
Mr. Masahiro Isomura Land Use Planner/Environmentalist
Mr. Antonio A. Alpasan Institutional Expert

APPENDIX

**PRESENTATION RE : PROGRESS REPORT OF THE STUDY ON
SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN**

Minutes of the Meeting

Date : September 13, 1996 at 3:00 P.M.

Venue : Meeting Room in Texicano Hotel, Laoag City, Ilocos Norte

Registered Participants

Attendance : 22 participants

6 members of JICA Study Team

The participants came from the following offices;

1) DPWH PMO-MFCP	: 1	2) DPWH Planning Service	: 4
3) DPWH PMO-FS	: 1	4) DPWH 1st INED	: 2
5) DPWH 2nd INED	: 2	6) PEO, Ilocos Norte	: 1
7) CEO, Laoag City	: 2	8) PPDO, Ilocos Norte	: 2
9) City Council, Laoag City	: 1	10) DENR PENRO, Ilocos Norte	: 1
11) DENR CENRO, Laoag City	: 1	12) NIA-INIP	: 1
13) NIA-INIS	: 1	14) JICA Philippine Office	: 1

1. Opening Remarks

District Engineer Rolando H. Tamayo, 1st Ilocos Norte Engineering District, explained briefly the background and objectives of the Project.

2. Presentation of the Progress Report

Mr. Murata, Team Leader of JICA Study Team, presented the progress of the captioned study during the period late March to mid September, 1996.

3. Open Forum

Following are the questions raised by the participants and responses from the JICA Study Team during the open forum.

- (1) City Engineers Office and Mr. Tamayo explained that local funds will be used to maintain the facilities at the northern side of the Laoag River. A question was raised as to how the dike will be constructed at the southern portion in the city area. Mr. Murata replied that the detailed dike alignment will be presented in the Master Plan. Further, he suggested that the lower reaches is more stable, so that the river improvement works can be concentrated at the fixed points of existing risky areas subject to overbanking flood and erosion.
- (2) Provincial Planning Development Office explained that the Physical Framework Plan of the Province is in the process of preparation under the assistance from the Australian Government. A question was raised as to how the proposed sabo and flood control plan will be integrated into the Framework Plan. Mr. Murata and

Mr. Alpasan explained the present situation and schedule of the Study. They recommended that the sabo and flood control plan shall be integrated into the Framework Plan after completion of the Master Plan and feasibility study.

- (3) A question was raised by DENR-PENRO as to the reason why a multi-purpose reservoir is not included in the Mater Plan study. Mr. Murata explained that the reservoirs are not feasible from topographic and economic aspects based on the assessment during the study.
- (4) DENR-CENRO recommended slope stabilization works, either by structural or vegetation, in some short stretch immediately upstream of the proposed sabo dams which are necessary to protect the structure and prolong its life. Mr. Murata replied that the said slope stabilization works shall be planned in the further study stage, if destruction from slides will endanger the sabo dam.
- (5) A question was raised from NIA-INIP as to what is the discrepancy of the design probability between the Master Plan and the diking system constructed by NIA. Mr. Murata explained that the whole rivers will be designed for a 25-year flood frequency. The NIA structure particularly the diking system have an existing capacity of 25-year probability. Further, the dikes are only temporary structure so that it can be regarded as less than the 25-year probability. In addition, flood design probability depends on economic, technical and social conditions. As a conclusion, there is no discrepancy between them.
- (6) A question was raised as to what effects will be expected in the environment by the construction of sabo dams. Mr. Murata promised that it will be discussed in the next stage.
- (7) Hon. Edison H. Bonoan, City Council member of Laoag City and Chairman of the Committee on Infrastructure, requested to include the drainage improvement of Laoag City in the JICA Study.

4. *Closing Remarks*

Engineer Rizal V. Ruiz, Project Manager II, OIC-2nd INED, extended appreciation to the JICA Study Team. The meeting was adjourned at 6:00 P.M.

JAPANESE INTERNATIONAL COOPERATION AGENCY (JICA)
 STUDY ON SABO AND FLOOD CONTROL
 IN THE LAOAG RIVER BASIN

LIST OF ATTENDANCE

	NAME	DESIGNATION	OFFICE	SIGNATURE
1	ERNIE U. FANO	Engr IV	PMO - MFCLP	
2	Napoleon S. FANADICO	Engr III	Planning Service, DPWH	
3	Charito C. Juliano	Princl. Engr	PEO - Ilacostrite	
4	(a) FELIX	DPWH Head III	DPWH	
5	Mitsuhisa OKUDA	Asst. Resident Rep.	JICA	
6	ANTONIO A. ALPASAN	Institutional Expert	JICA Study Team	
7	Nolando H. Tamarzo	DB - DPWH I	DPWH, Laoag City	
8	ALFREDO F. LERENDON	IRRI. SUPT.	NIA-IPIS, LAOAG	
9	LEONARDO ACOSTA	ENGR	DGNK, Laoag City	
10	Edmund Pascua	sup'c DESIGN ENGR	NIA-IPIS	
11	WILSON GWYMMAS		IPWA - 2nd DISTRICT	
12	RIZAL ANTE	PHD - UC DE	DPWH 2nd DISTRICT	
13	UZAL E. SANTIAGO	ENGR. II	CITY ENGINEER LAOAG	
14	Ray A. Jimenez	ENGR. II	LAOAG CITY	
15	Artemio C. Dumalao	CLC	DEPT. - DENR	
16	Romy ESCANO	ECONOMIST IV	PMO - FS	
17	LALINE MALASSAB	ECONOMIST II	PLANNING SERVICE	
18	CARLOS P. ZAMORA	Engr II	DPWH	
19	JOHNNY MONTAÑO	"	"	
20	EDISON BONDAN	CITY COUNCILOR	LAOAG CITY	
21	B. HAZEL B. LERENDON		PPDO, I. W. DISTRICT	
22	MARCELOS A. RAMOS	PRO IB	PPDO - I.M.	
23	Naohito MURATA	Team Leader	JICA Study Team	
24	Kanehiro MORISHITA	Asst. Team Leader	JICA Study Team	
25	AKIO SHICHIKAWA	structural Engr	"	
26	Tatsuo TASHINO	Study Team Economist	"	
27	Masahiro Isoyama	land use/environment	"	

MINUTES OF DISCUSSIONS

Among the JICA Advisory Committee, DPWH Steering Committee, Technical Working Group and JICA Study Team Regarding the Study on Sabo and Flood Control in the Laoag River Basin

Date : January 24, 1997 (Friday), 2:00 PM to 3:45 PM

Place : Conference Room
Office of Undersecretary Teodoro T. Encarnacion
3rd Floor, DPWH Central Office Building
Bonifacio Drive, Port Area, Manila

Participants : Refer to attached attendance record - Annex "A"

Undersecretary Encarnacion presided over the meeting. Before taking up the agenda, he welcomed the JICA Advisory Committee and Study Team. He also expressed sincere appreciation for the Mission in behalf of the Department for the continuance of the study.

Mr. Watanabe, Chairman of the JICA Advisory Committee, informed the body that the main agenda of the meeting is the presentation of the Interim Report for the Study.

Mr. Murata, Team Leader of the Study Team, presented and discussed the Interim Report, and the important matters mentioned were as follows:

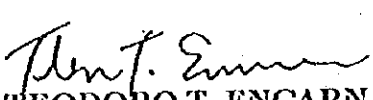
1. The design flood adopted for the structures is the 25-year flood.
2. In the Master Plan, structural measures proposed are eight (8) sabo dams and twelve (12) river improvement projects.
3. Construction works quantities and estimate were also presented. Estimated cost is P2,177.8 Million at 1996 price levels. Cost does not include price escalation.
4. Implementation will be in three (3) phases, starting in 1999 up to year 2012. Scope of works covered by Phase 1 are the priority projects. DPWH shall make final financial arrangements for the project in its infrastructure program starting in 1998.
5. Economic Evaluation shows an EIRR of 21.9%.
6. Environmental Impact Assessment will be enhanced during the Feasibility Study stage.


In the ensuing discussion, the following matters were raised and answered, to wit:

1. The existing dike along Solsona, Papa and Madongan Rivers which NIA temporarily proposes to be turned over to DPWH for maintenance was temporarily held in abeyance pending the determination of the stability of the structures and the completion of the study should it be confirmed that said structure will be part of the flood control plan that shall be adopted. However, it was informed by Dir. Hernandez that the Department of Agriculture thru representations made by the provincial government of Ilocos Norte, agreed to fund the maintenance of the dikes for the meantime.

2. The idea of exporting construction aggregates derived from the Laoag River to nearby countries like Japan is temporarily not being pursued by the Study Team.
3. The request of the Laoag City Council for the inclusion of the city internal drainage system in the study was favorably considered by JICA. This will be included by the Study Team in the Feasibility Study stage.
4. When queried by the Study Team if DPWH is capable of funding Phase I of the project which is to be implemented in a span of five (5) years, Undersecretary Encarnacion responded that there is a great possibility of funding the same, subject to the annual appropriations authorized by Congress.
5. The Team Leader of the Study Team explained that the useful life span of the sabo dams will be considerably long.

The meeting was adjourned at 3:45 P.M.


TEODORO T. ENCARNACION
Undersecretary, DPWH
Chairman, Steering Committee


NAOHITO MURATA
Team Leader
JICA Study Team

Noted:

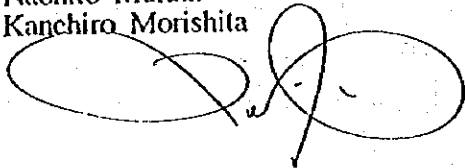
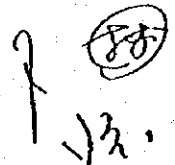

MASAYUKI WATANABE
Chairman
Advisory Committee
JICA

ATTENDANCE RECORD
Meeting
Among the JICA Advisory Committee, DPWH Steering Committee,
Technical Working Group and JICA Study Team
Re: Study on Sabo and Flood Control
in the Laoag River Basin

Date : January 24, 1997, 2:00 PM - 3:45 PM

Place : Conference Room of Undersecretary
 Todoro T. Encarnacion

- | | | | |
|-----|------------------------|---|---|
| 1. | Teodoro T. Encarnacion | - | Undersecretary |
| 2. | Ernesto M. Hernandez | - | Regional Director, Reg. I |
| 3. | Gregorio O. Carillo | - | Assistant Director, BOD |
| 4. | Nonito F. Fano | - | OIC - Project Director |
| 5. | Masayuki Watanabe | - | PMO-Major Flood Control Project
Chairman, JICA Advisory
Committee |
| 6. | Fumihiko Nakamura | - | JICA Advisory |
| 7. | Yurie Tsuchiya | - | JICA Advisory |
| 8. | Hisakatsu Okuda | - | JICA Philippines |
| 9. | Yoshiki Nagai | - | JICA Expert |
| 10. | Resito V. David | - | Project Manager, PMO-Major
Flood Control Project |
| 11. | Akio Shichijugari | - | JICA Study Team |
| 12. | Masashiro Isomura | - | JICA Study Team |
| 13. | Antonio A. Alpasan | - | JICA Study Team |
| 14. | Linda M. Templo | - | OIC - Director, Planning Service |
| 15. | Manuel S. Alconis | - | PED, Planning Service |
| 16. | Ernie U. Fano | - | Engineer IV, PMO-MFCP |
| 17. | Naohito Murata | - | Team Leader, JICA Study Team |
| 18. | Kanehiro Morishita | - | Co-Team Leader, JICA Study
Team |

MINUTES OF DISCUSSIONS

Between the DPWH Technical Working Group and JICA Study Team Regarding the Study on Sabo and Flood Control in the Laoag River Basin

Date : 10:00 a.m., March 17 (Monday), 1997
Place : Conference Room
Metro Manila Flood Control Project II
National Capital Region-DPWH
2nd St. Port Area, Manila
Participants : Refer to attached attendance record - Annex "A"

OIC-Project Director Nonito Fano presided over the meeting. He welcomed the Study Team and the Technical Working Group and expressed his sincere appreciation in behalf of the Department for the continuance of the Study. The Team submitted thirty (30) copies of the Progress Report II to Mr. Resito David, chairman of the Technical Working Group. The presentation of the Progress Report II is the main agenda of the Meeting.

Mr. Murata, Team Leader of the Study Team, presented and discussed the contents of the Progress Report II with the following important matters mentioned:

- 1) The proposed sabo dams, river improvement works and the urban drainage in Laoag City and were the main subjects of the further data collection and field investigation for the feasibility study during this period (January to March 1997).

The urban drainage basin of Laoag City is hydrologically independent of the Laoag River. The study results of urban drainage will be compiled as a separated part of the report.
- 2) Plans, longitudinal profiles, location and some salient features of the proposed sabo dams were discussed. The requirement for land acquisition and compensation at the proposed sabo dam sites is minimal. Few people will be affected in its implementation. Geological condition of the sabo dam sites was evaluated and considered to have a sufficient bearing capacity for a fixed or floating type depending on the depth of river deposits.
- 3) The proposed Papa sabo dam will maintain its outflow of sediment below the sediment transport capacity at the fan apex for a long period. It was verified that control effects of sediment by the proposed sabo dams could last beyond the project life, which was preliminarily evaluated in the master plan.
- 4) River morphological study indicates the adequate construction sites for slope and toe protection and the necessary foundation depth.
- 5) In the discussion regarding environmental impact, it was mentioned that Public Hearing or Community Consultations would be the responsibility of the DPWH with assistance of the Study Team.


In the ensuing discussion, the following matters were raised and answered, to wit:

- 1) On how the on-going quarrying affects to the project; it was informed that the scattered quarrying in the river is concentrated on the middle-section as per


directive of the governor, hence, it has little effect on the existing diking system.

- 2) On the rate of sedimentation, it was explained that, as shown in Table 2.1, only the distance of 5.5 km to 7.0 km of Papa River from the confluence with Bongo River would have significant aggradation rate.
- 3) On the alignment of proposed diking system to protect the town proper of San Nicolas, the alignment of the existing flood wall which the DPWH constructed in 1996 should be followed.

Meeting was adjourned at 0:25 p.m.

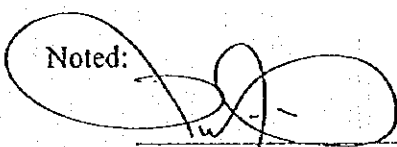


RESITO V. DAVID
Project Manager, PMO-MFCP
Chairman, Technical Working Group



NAOHITO MURATA
Team Leader
JICA Study Team

Noted:



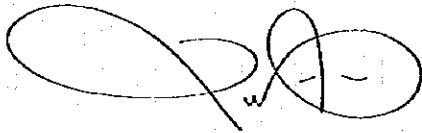
Nonito F. Fano
OIC-Project Director
PMO-MFCP
& Member, Steering Committee

ATTENDANCE RECORD
MEETING

Between the Technical Working Group and JICA Study Team

Re : Study on Sabo and Flood Control in the Laoag River Basin
Date : March 17, 1997
Place : Conference Room of MMFCP II,
NCR-DPWH

- | | | |
|-----|--------------------|---|
| 1. | Nonito F. Fano | OIC - Project Director
PMO-Major Flood Control Project |
| 2. | Bernardo P. Aman | Assistant Project Director
PMO-Major Flood Control Project |
| 3. | Resito V. David | Project Manager, PMO-Major
Flood Control Project |
| 4. | Manuel S. Alconis | PED, Planning Service |
| 5. | Rolando H. Tamayo | District Engineer, 1st Engineering District,
Ilocos Norte |
| 6. | Naohito Murata | Team Leader, JICA Study Team |
| 7. | Kanehiro Morishita | Co-Team Leader, JICA Study Team |
| 8. | Akio Shichijugari | JICA Study Team |
| 9. | Antonio A. Alpasan | JICA Study Team |
| 10. | Yuzou Mizota | JICA Study Team |
| 11. | Ernie U. Fano | Engineer IV, PMO-MFCP |
| 12. | Leonardo Lingan | Bureau of Design |
| 13. | Rebecca T. Garsuta | PED, Planning Service |
| 14. | Carlos Zamora | PED, Planning Service |



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MINUTES OF DISCUSSIONS

Among the JICA Study Team, DPWH Steering Committee and Technical Working Group regarding the Study on Sabo and Flood Control in the Laoag River Basin.

Date : 9:00 a.m., July 14 (Monday), 1997
Place : Conference Room
Office of Undersecretary Teodoro T. Encarnacion
3rd Floor, DPWH Central Office Building
Bonifacio Drive, Port Area, Manila
Participants : Please refer to attached attendance sheet - Annex "A"

The meeting was presided by Undersecretary T. Encarnacion as Chairman of the Steering Committee. The meeting opened with Undersecretary T. Encarnacion welcoming the Study Team, Steering Committee members and all others present. There is a brief introduction each of the Steering Committee members or their representative to the Study Team.

Mr. Murata, Team Leader of Study Team took over and presented the results of the Feasibility Study of the said project. Firstly, it was informed that the Feasibility Study already includes the Laoag City Urban Drainage.

Other important matters, which he presented and discussed are as follows;

- 1) The most important activity done during this Feasibility Study was the Sediment Analysis. This is so because annual sediment, average aggradation/degradation evaluation will tell how sabo dams function and their effects. Hence, it was concluded in the study that the project is technically feasible with the construction of sabo dams.
- 2) He also dwelt on the formation of sand bars in the river channels which will aid to estimate the degree of bank erosion. The sediment analysis including sand bars formation will determine the design criteria for bank protection works such as spurdiike interval and foundation depth.
- 3) There was also a lengthy discussion on the proposed river improvement works especially on the comparison between revetment and spurdiike. It was informed that construction of revetment will require massive toe protection works which will entail more cost. Therefore, most of the works will be spurdikies.
- 4) As reflected in the report most land acquisition will be on farmland/bush land. House resettlement is very minimal.
- 5) The project has been evaluated technically completely. Economic evaluation is still on-going.
- 6) Environmental impacts of the projects are minimal.
- 7) It was also stated that concern about irrigation water was studied during the Master Plan, but was however disregarded during the Feasibility Study stage because the sabo dams proposed are the floating type incapable of water storage. Provision of water storage capability will require a large foundation fixed on the base rock.

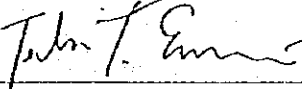
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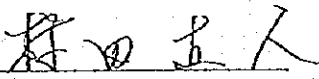
- 8) The Laoag City Urban Drainage is mostly influenced by the Daorao River Basin which is independent of the Laoag River.
- 9) As in Laoag River Basin, the Laoag City Urban Drainage Project will require no house resettlement and there is no negative environmental impact.

During the discussion, the following matters were raised and answered, to wit;

- 1) The positioning of spurdikes as adopted for the moment are perpendicular. However, in sections nearby bends it will be positioned a little inclined to the direction opposite the flow.
- 2) Considering gabions as toe protection works, it was cited that due to very high velocity of flow, gabion may not withstand such flow.
- 3) The interval distance of spurdike is 30-60 m depending on the riverbed slope.
- 4) Regarding endorsement by politicians/RDC, it was informed that since public consultation has been conducted by DPWH, ten (10) mayors in flood prone areas signified their endorsement of the project in writing and the RDC had somewhat made an informal endorsement of the project.
- 5) The cost of rehabilitating the existing NIA dikes is already incorporated in the cost estimate.
- 6) On the query of the Study Team whether the annual P 450 M fund requirement for 4 years can be met by DPWH, it was suggested that the matter be confirmed first with the Planning Service and reply should be transmitted to Study Team within 2 -3 days.

With no further matters to be discussed and with the group agreeable to the recommendation of the Study Team contained in Progress Report III, the meeting was adjourned at 11:40 a.m.


TEODORO T. ENCARNACION
Undersecretary, DPWH
Chairman, Steering Committee


NAOHITO MURATA
Team Leader
JICA Study Team

ATTENDANCE RECORD
MEETING

Steering Committee/Technical Working Group/Study Team

Re : Study on Sabo and Flood Control in the Laoag River Basin
Date : July 14, 1997
Place : Conference Room of Undersecretary T. T. Encarnacion

1.	Teodoro T. Encarnacion	Undersecretary
2.	Naohito Murata	JICA Study Team
3.	Kanehiro Morishita	JICA Study Team
4.	Hisakatsu Okuda	JICA Phils Office
5.	Yoshiki Nagai	JICA Expert/DPWH
6.	Antonio A. Alpasan	JICA Study Member
7.	Nonito F. Fano	OIC-Project Director, PMO-MFCP
8.	Akio Shichijugari	JICA Study Team
9.	Tsuyoshi Matsushita	JICA Study Team
10.	Nobuyuki Takanashi	JICA Study Team
11.	Masahiro Isomura	JICA Study Team
12.	Tatsuo Tashino	JICA Study Team
13.	Rizal V. Ruiz	District Engineer, 2nd District, San Nicolas, Ilocos Norte
14.	Glenn V. Reyes	DPWH INED I District
15.	Wilson Quiamas	DPWH INED II District
16.	Ernie U. Fano	DPWH-PMO-MFCP
17.	Resito V. David	Project Manager-PMO-MFCP
18.	Bienvenido C. Leuterio	Director, BOD, DPWH
19.	Manuel S. Alconis	Chief, PED, Planning Service
20.	Daniel G. Domingo	DPWH-Region I, S.F. La Union
21.	Rolando H. Tamayo	DPWH-INED, Ilocos Norte

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MINUTES OF DISCUSSION

Among the Members of JICA Study Team, DPWH Steering Committee,
Technical Working Group and the Advisory Committee
on the Study on Sabo and Flood Control in the Laoag River Basin

- Date - 2:00 p.m., September 19, 1997 (Friday)
- Place - Conference Room, Office of Assistant Secretary
Manuel M. Bonoan, 3rd Floor, DPWH Central Office
Building, Bonifacio Drive, Port Area, Manila
- Agenda - Presentation of the Draft Final Report
- Participants - Please refer to attached attendance sheet - *Annex "A"*

The meeting formally started at 2:05 p.m. Project Director Nonito F. Fano presided over the meeting in the absence of Undersecretary Teodoro T. Encarnacion, Chairman of the Steering Committee. After the usual welcome greetings, the introduction of the members of both panels of the JICA and DPWH followed. The presence of Mr. Mikio Ishiwatari, Head of the OECF Appraisal Mission for the 22nd Yen Loan Package, as observer in the meeting was acknowledged by the Acting Chairman.

Regarding the Draft Final Report, Dr. Watanabe, Chairman of the JICA Advisory Committee, reminded the Study Team and GOP Panel that pertinent comments must be submitted one (1) month after this meeting.

Mr. Murata, Study Team Leader, submitted the Draft Final Report consisting of five (5) volumes and proceeded with the presentation by referring to the Main Report and Summary Report.

Presented in the Report are the following:

1. The details of the structures embodied in the Master Plan and priority projects recommended for implementation under the Sabo and Flood Control Study in the Laoag River Basin;
2. The urban drainage plan for Laoag City including recommended priority projects for implementation.

DPWH accepted in principle the results of the Study.

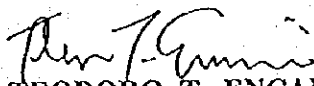
Some matters of clarifications and concerns raised and addressed were:

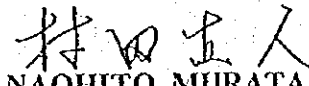
1. On the query of OIC Asst. Director Gilbert Reyes of the Bureau of Design, in regards to the effect of the fluctuating exchange rate of the peso against the

dollar, Mr. Murata replied that in the calculation of economic costs and benefits, there was applied a shadow exchange rate, which can more or less take care of the instability of the peso.

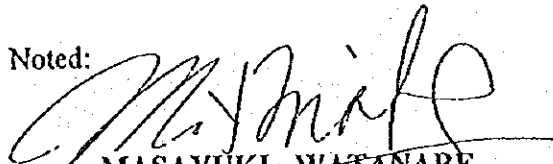
2. On the accompanying "Recommendations" which will later form part of the Final Report as Chapter 10, the following matters will be added:
 - a. Watershed management as a vital non-structural measure must be pursued vigorously;
 - b. The existing temporary dikes built by NIA under INIP I, which are proposed to be rehabilitated and strengthened under this project, shall now be accepted by DPWH, to prevent further deterioration;
 - c. Hydraulic Model Test to determine the effect of sand bars in the design of flood control structures will be undertaken during the Detailed Design Phase;
 - d. Transfer of Technology which will include the enhancement of the flood fighting capabilities of the local people will be pursued during the construction phase.
3. Mrs. Garsuta of the Planning Service noted that the Terms of Reference for the Study requires a full blown Environmental Impact Assessment (EIA) Report but the Draft Final Main Report contains only a summary statement of the environmental impact. To this regard, it was informed that a complete EIA Report is included in Supporting Report, Volume III-2.

The meeting was adjourned at 4:30 p.m.


TEODORO T. ENCARNACION
Undersecretary, DPWH
Chairman, Steering Committee


NAOHITO MURATA
Team Leader
JICA Study Team

Noted:


MASAYUKI WATANABE
Chairman, JICA Advisory Committee

ATTENDANCE LIST MEETING

Steering Committee/Technical Working Group/Advisory Committee/Study Team

Re : Study on Sabo and Flood Control in the Labag River Basin

Date : September 19, 1997

Place : Conference Room of Undersecretary T. T. Encarnacion

Name	Designation	Office	Signature
1. AKIO SHIOHJUGARI	JICA STUDY TEAM		<i>[Signature]</i>
2. Kanehiro MORISHITA	-do-		<i>[Signature]</i>
3. Naohito MURATA	-do-		<i>[Signature]</i>
4. Fumihiko Nakamura	Ministry of Construction		<i>[Signature]</i>
5. Masayuki MATSUNAGA	JICA		<i>[Signature]</i>
6. NOVITO F. FERNANDEZ	Dir. Major Proj. Ctl.		<i>[Signature]</i>
7.			
8. BIENVENIDO C. LEUTERIO	BOD - DPWH		<i>[Signature]</i>
9. LINDA M. TEMPLO	PS - DPWH		<i>[Signature]</i>
10. SOFIA SANTALUCIA	BOD - DPWH		<i>[Signature]</i>
11. DANIEL G. DOMINGO	Region I		<i>[Signature]</i>
12. Rebecca T. Garsutan	PS, DPWH		<i>[Signature]</i>
13. Manuel S. Alconis	Planng. Service		<i>[Signature]</i>
14. ANTONIO A. ALPASAN	JICA - Study Team		<i>[Signature]</i>
15. Miki ISHIIWAKI	O.E.C.P.		<i>[Signature]</i>
16. Yuzo MIZOTA	JICA STUDY TEAM		<i>[Signature]</i>
17. KENJI SUZUKI	JICA Expert, DPWH		<i>[Signature]</i>
18. Hisakatsu OKUDA	JICA Phils. Office		<i>[Signature]</i>
19. ERNIE U. FANU	PMO - MFCP		<i>[Signature]</i>
20. Prudenciana A. Ocampo	PMO - MFCP		<i>[Signature]</i>
21. Wilfredo S. Reyes	BOD - DPWH		<i>[Signature]</i>
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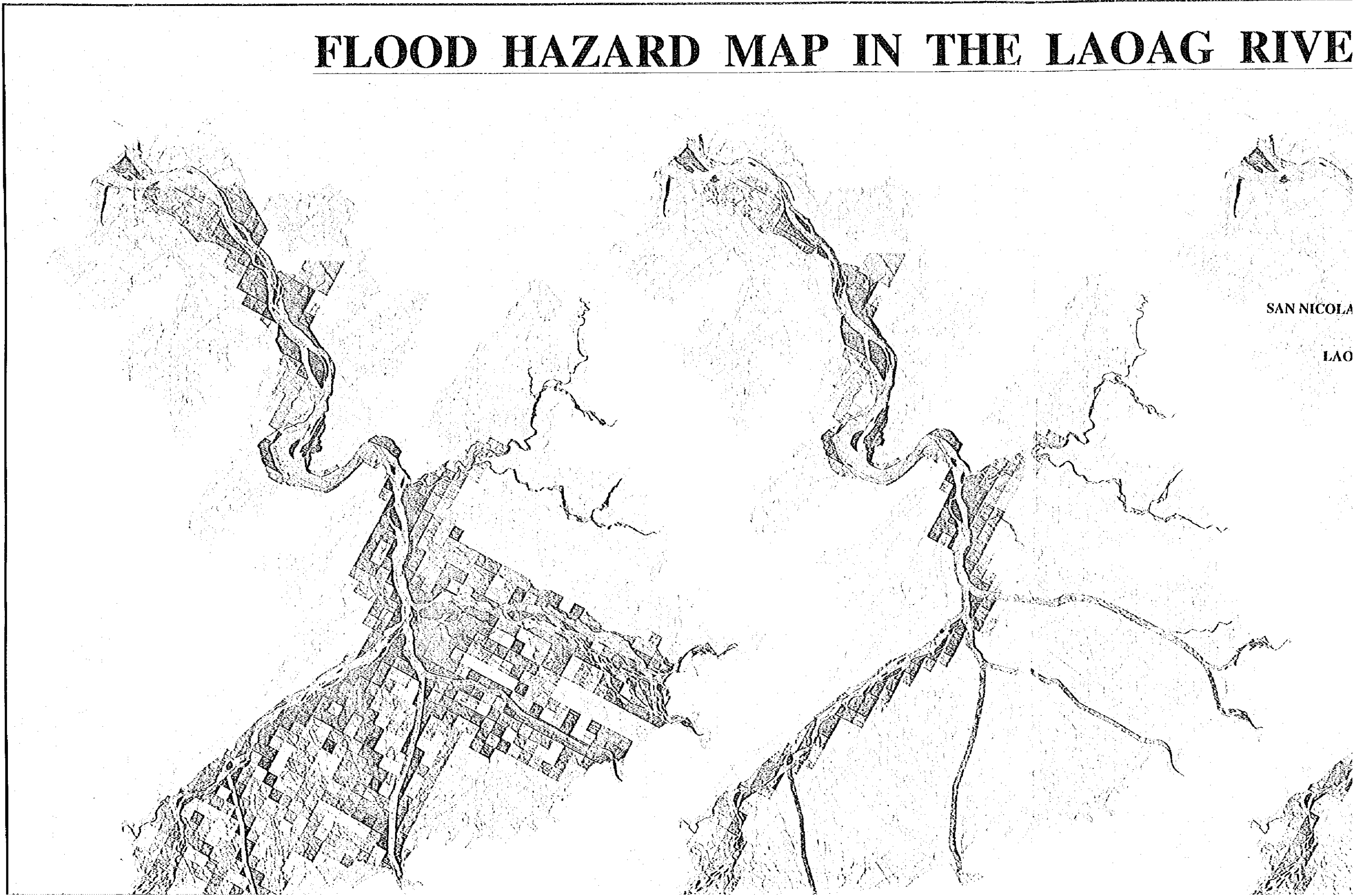
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RECOMMENDATIONS

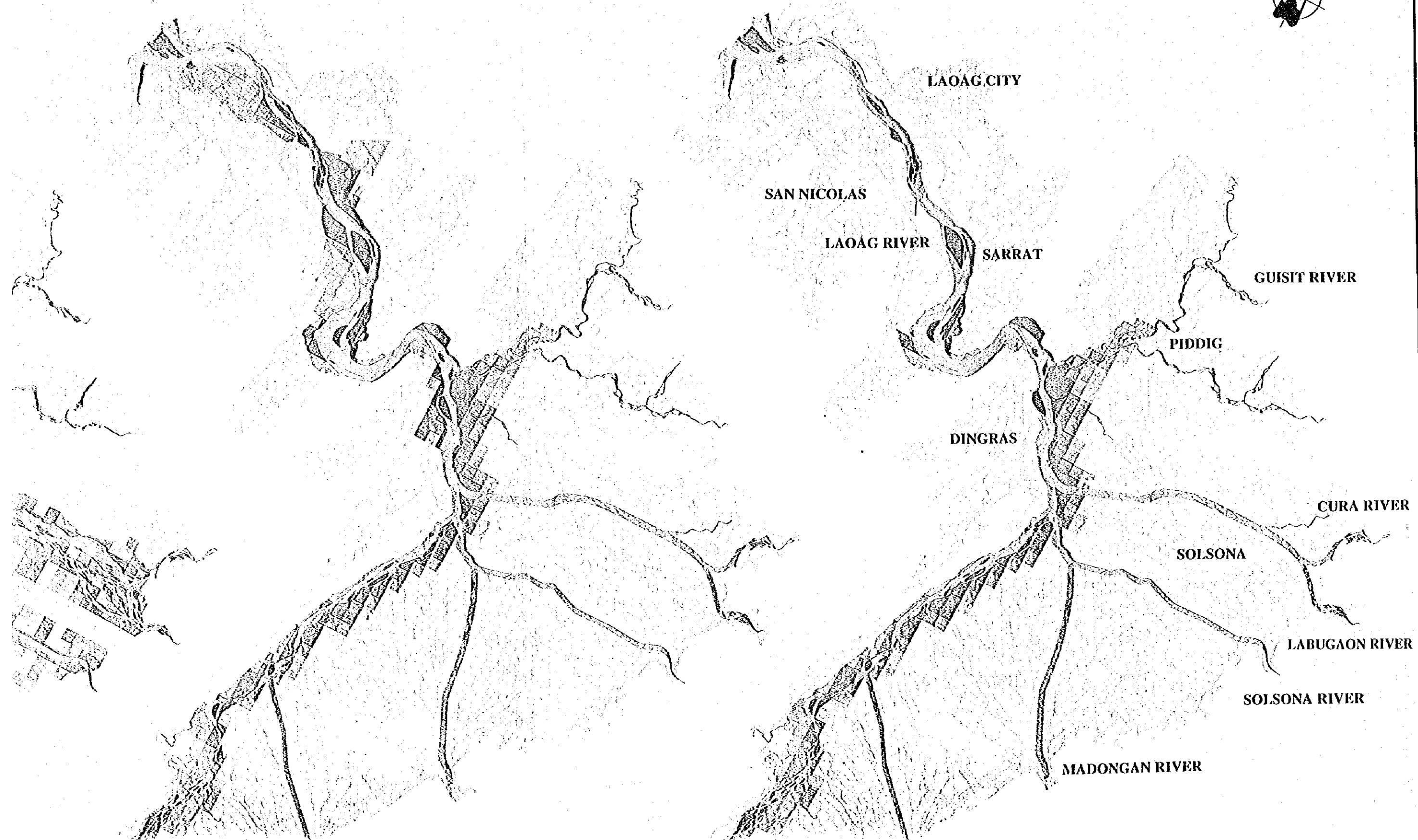
1. The proposed sabo dam and river improvement priority projects are technically and economically feasible. Environmentally, they will generate no significant adverse effects. Urgent implementation of the projects is recommended in consideration of the recurrent serious floods in the Laoag River Basin. The required financial sources should be arranged as soon as possible.
2. Hydraulic model tests are considered necessary to check the riverbed aggradation or degradation in some critical river sections of the alluvial fan rivers and to determine the detailed dimensions of the spur dikes including length, interval, height, shape and foundation depth. Such model tests should be conducted in the detailed design stage.
3. Monitoring of riverbed variation in the alluvial fan rivers is considered necessary to avert flood risk due to unexpected sediment deposition in the riverbed. For this purpose, periodical cross-sectional survey at fixed river sections should be conducted. Further, local riverbed scouring around the major structures should be periodically inspected to prevent structural damage that may cause vital flood disasters.

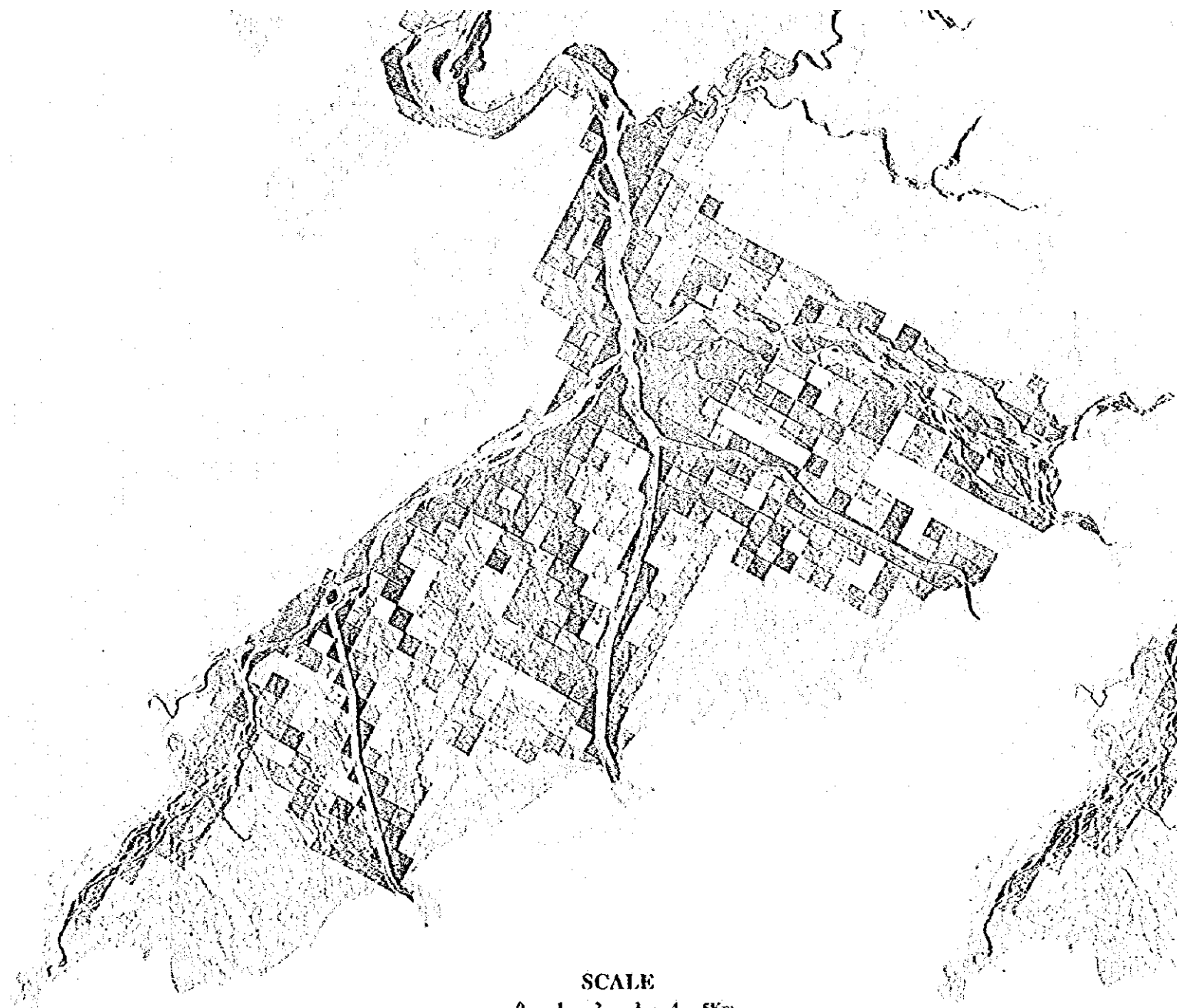
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FLOOD HAZARD MAP IN THE LAOAG RIVE



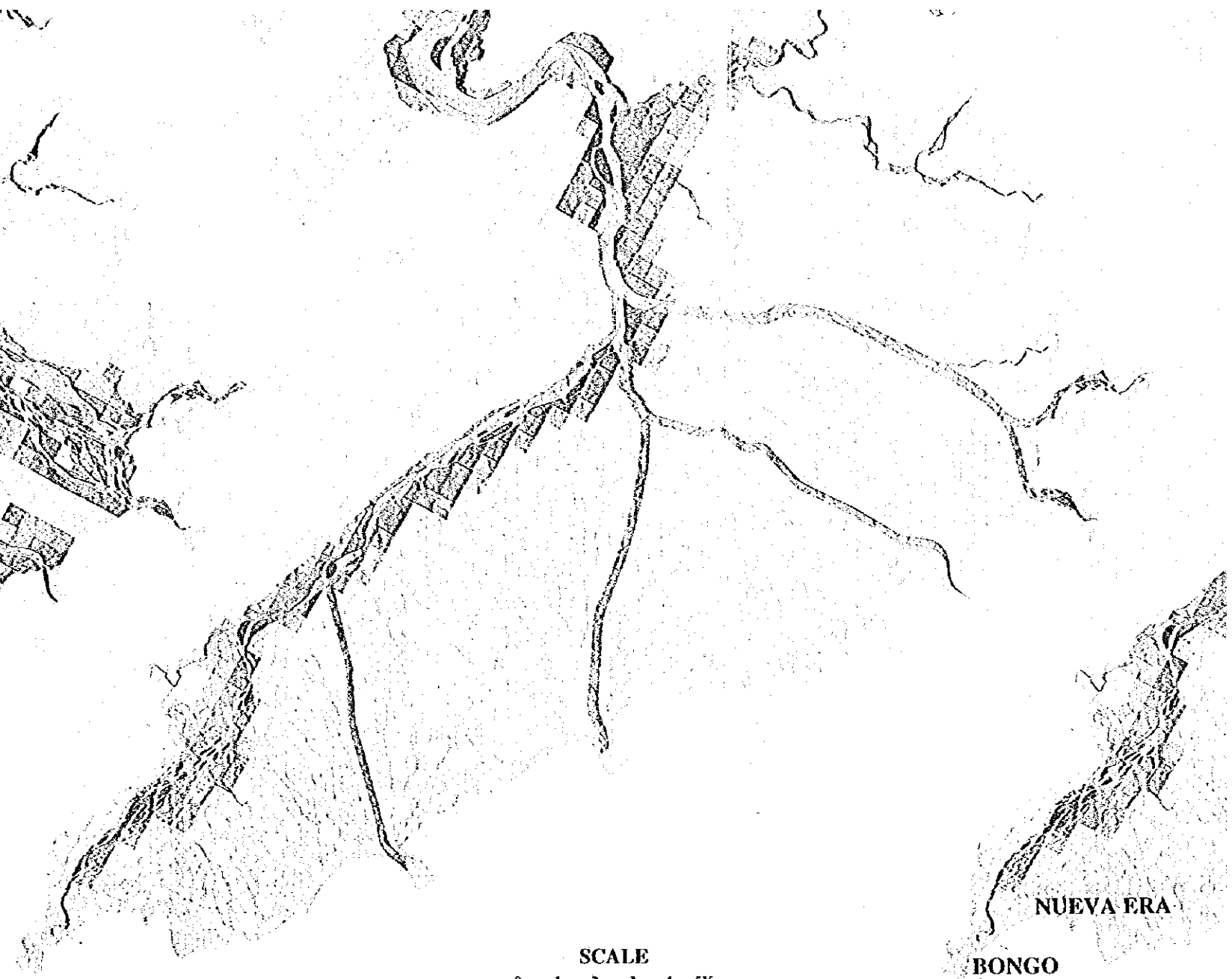
AZARD MAP IN THE LAOAG RIVER BASIN





SCALE
0 1 2 3 4 5Km

25-YEAR FLOOD WITHOUT PROJECT



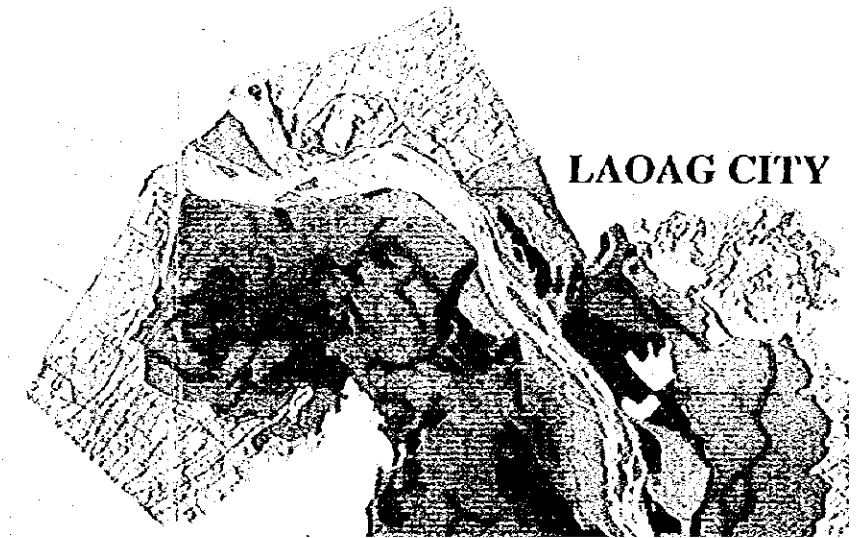
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25-YEAR FLOOD WITH URGENT PROJECT

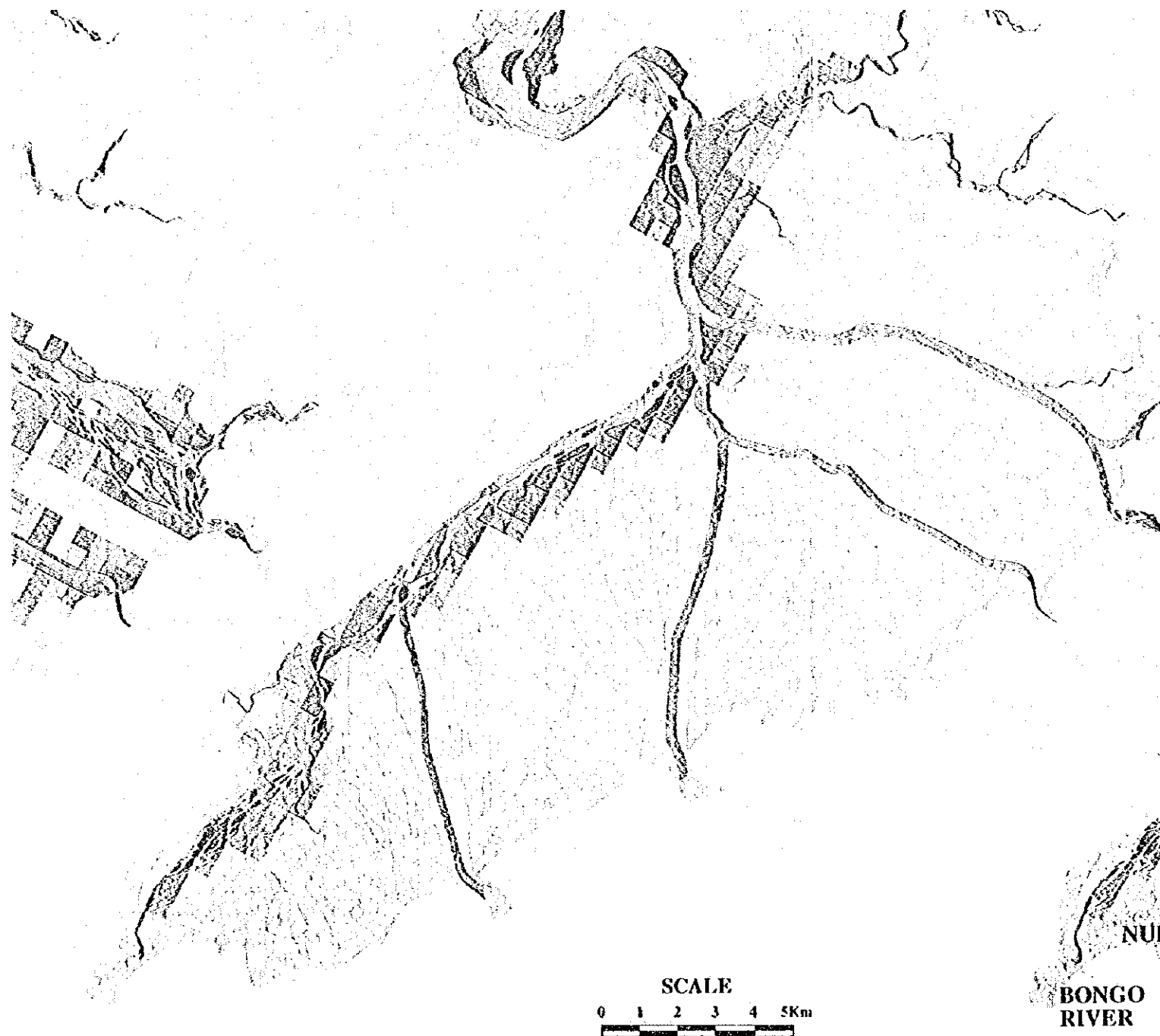
NUEVA ERA
BONGO RIVER

25-Y

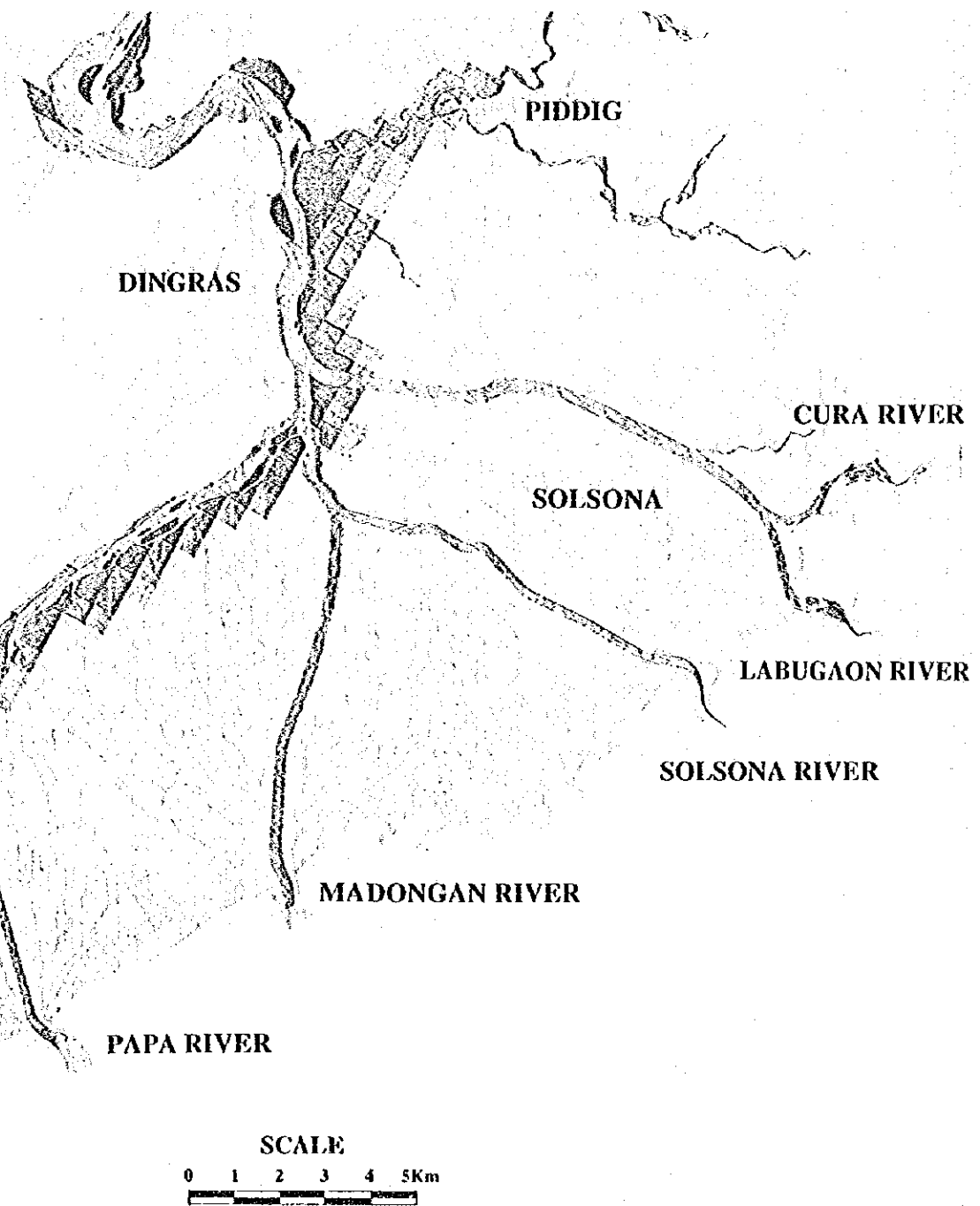
INUNDATION DEPTH(D)	
	$0 < D < 0.5m$
	$0.5m \leq D < 1.0m$
	$1.0m \leq D < 2.0m$
	$2.0m \leq D$



LAOAG CITY



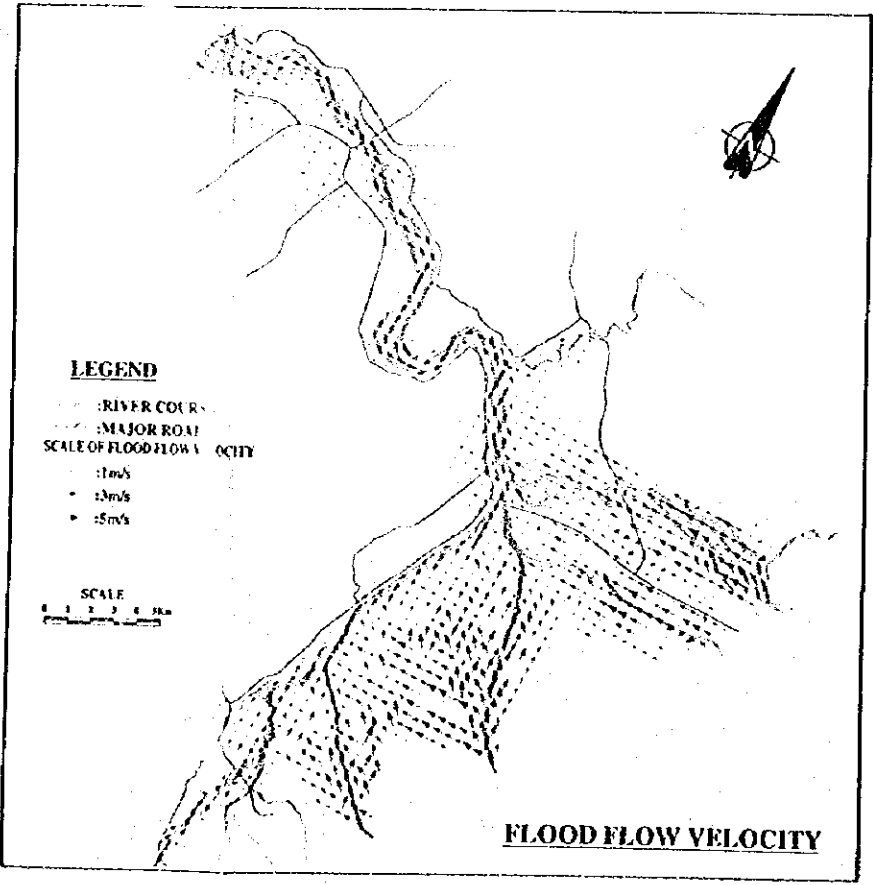
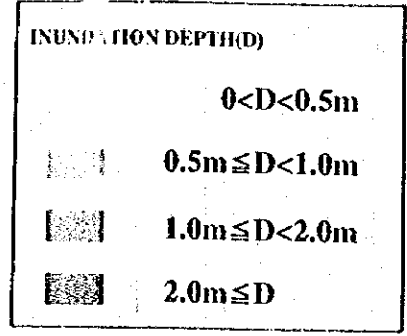
25-YEAR FLOOD WITH URGENT PROJECT

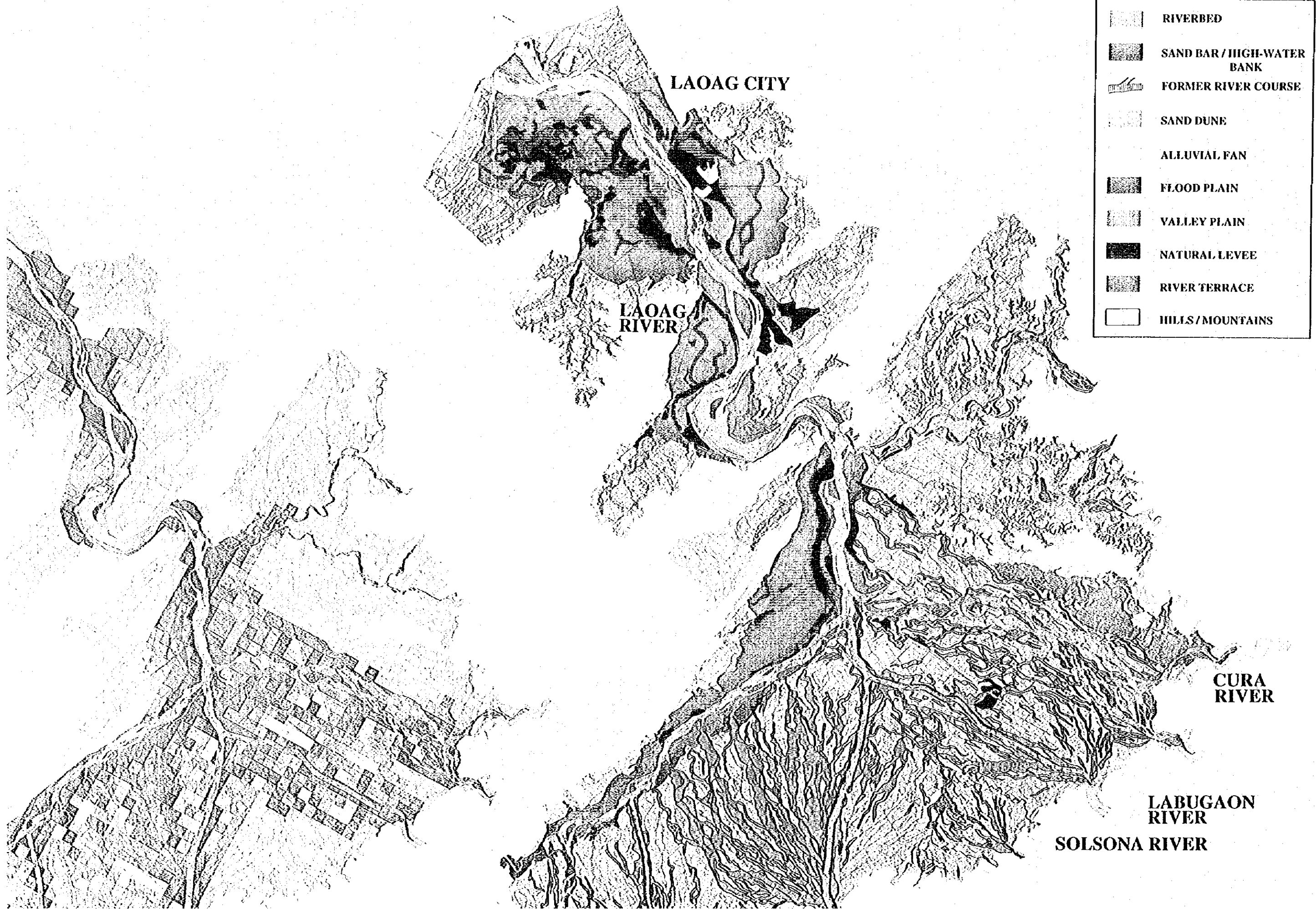


25-YEAR FLOOD WITH WHOLE PROJECT



- | | |
|--|----------------------------|
| | RIVERBED |
| | SAND BAR / HIGH-WATER BANK |
| | FORMER RIVER COURSE |
| | SAND DUNE |
| | ALLUVIAL FAN |
| | FLOOD PLAIN |
| | VALLEY PLAIN |





LAOAG CITY

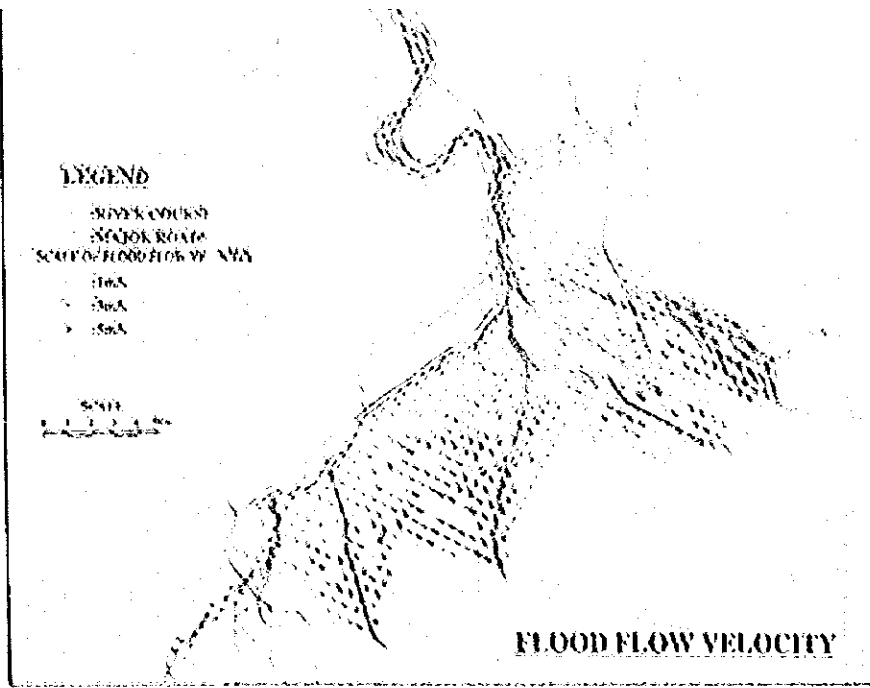
LAOAG RIVER

CURA RIVER

LABUGAON RIVER

SOLSONA RIVER

- | | |
|--|-----------------------------------|
| | RIVERBED |
| | SAND BAR / HIGH-WATER BANK |
| | FORMER RIVER COURSE |
| | SAND DUNE |
| | ALLUVIAL FAN |
| | FLOOD PLAIN |
| | VALLEY PLAIN |
| | NATURAL LEVEE |
| | RIVER TERRACE |
| | HILLS / MOUNTAINS |

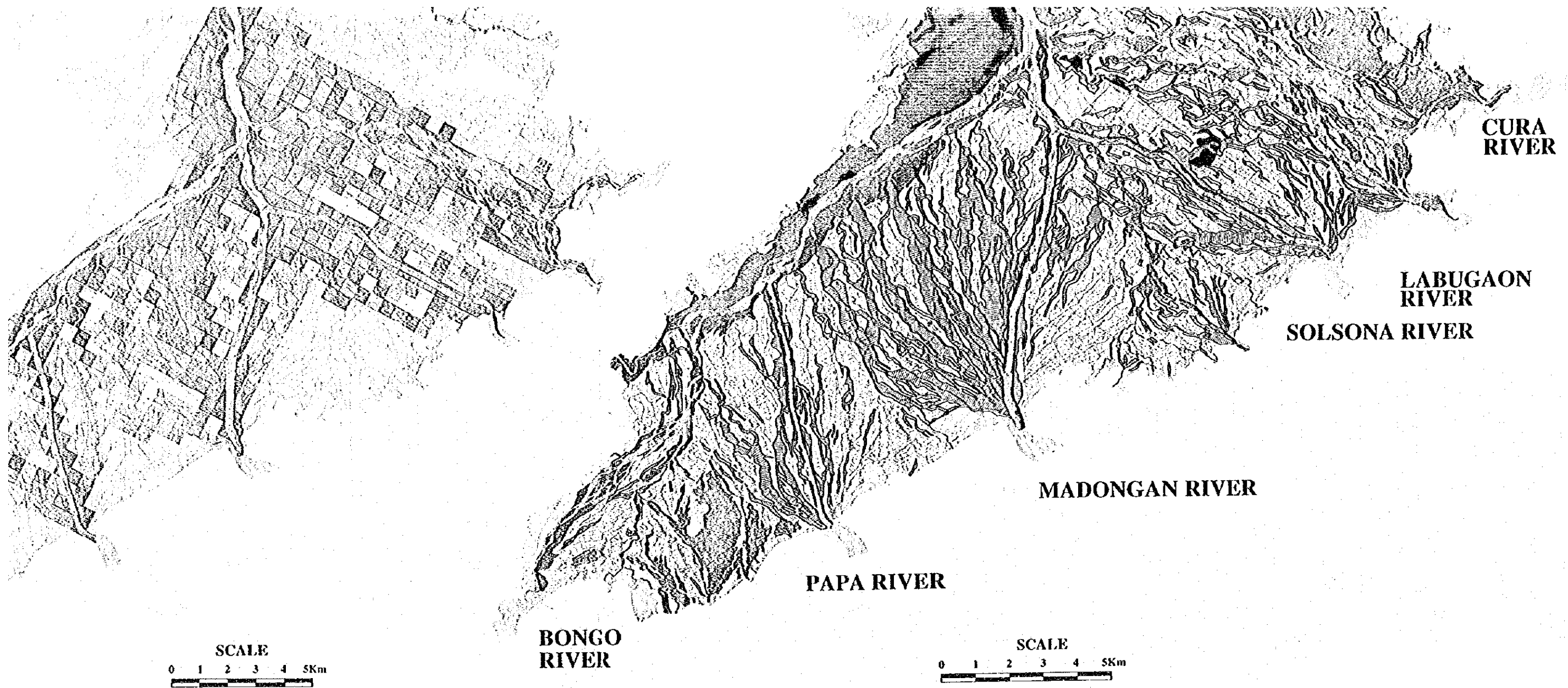


100-YEAR FLOOD WITHOUT PROJECT

GEOMORPHO

Note:
 Shown is the flood hazard map of the Laoag River Basin, including 25-year and 100-year return periods was performed using the T...
 of 500m by 500m and putting hydraulic and topographic data in...
 proposed master plan project (whole project) and the selected ur...

THE STUDY ON SABO AND FLOOD CONTROL



YEAR FLOOD WITHOUT PROJECT

GEOMORPHOLOGICAL MAP

Note:

Shown is the flood hazard map of the Laoag River Basin, including the geomorphological map. Simulation of inundation areas and depths of floods of 25-year and 100-year return periods was performed using the Two-Dimensional Unsteady Flow Model, by dividing the flood prone areas into mesh blocks of 500m by 500m and putting hydraulic and topographic data into each mesh. Also, simulation of floods of 25-year return period after construction of the proposed master plan project (whole project) and the selected urgent project was carried out.

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN



JAPAN INTERNATIONAL COOPERATION AGENCY



DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, REPUBLIC OF THE PHILIPPINES

JICA