

DEPARTMENT OF
PUBLIC WORKS AND HIGHWAYS
THE REPUBLIC OF THE PHILIPPINES

**THE PREPARATORY STUDY
FOR
SECTOR LOAN ON
DISASTER RISK MANAGEMENT
IN
THE REPUBLIC OF THE
PHILIPPINES**

FINAL REPORT

SUMMARY

JANUARY 2010

JAPAN INTERNATIONAL COOPERATION AGENCY



CTI ENGINEERING INTERNATIONAL CO., LTD.

in association with



NIPPON KOEI CO., LTD

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(as of 31st August 2009)

PREFACE

The Government of Japan decided to conduct a preparatory study for Sector Loan on Disaster Risk Management in the Republic of the Philippines and entrusted the Study to the Japan International Cooperation Agency (JICA).

JICA sent to the Philippines a study team headed by Mr. Yoshiharu Matsumoto of CTI Engineering International Co., Ltd. in association with Nippon Koei Co., Ltd, during the period of March 2009 and December 2009.

The Study Team held discussions with the officials concerned of the Government of the Philippines and JICA which examined the Study from specialist and technical point of view, and conducted field surveys at the study areas. Upon returning to Japan, the Study Team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the sector loan project on disaster risk management, and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Philippines for their close cooperation extended to the Study Team.

January, 2010

Izumi TAKASHIMA

Vice-President

Japan International Cooperation Agency

The Preparatory Study for Sector Loan on Disaster Risk Management in the Republic of the Philippines

January 2010

MR. IZUMI TAKASHIMA
Vice-President
Japan International Cooperation Agency
Tokyo, Japan

Ref.: **The Preparatory Study for Sector Loan on Disaster Risk Management in the Republic of the Philippines**

Subj.: **Final Report - Letter of Transmittal**

Dear Sir:

We are pleased to submit herewith the Final Report on “The Preparatory Study for Sector Loan on Disaster Risk Management” for your kind consideration. This report compiles the results of the Study in accordance with the contract between CTI Engineering International Co., Ltd. in association with Nippon Koei Co., Ltd. and the Japan International Cooperation Agency (JICA) during the period of March 2009 to January 2010.

During the Study, the Study Team prepared the implementation of the sector loan on disaster risk management together with the possibility of the creation of Disaster Response Fund including setup of cooperative agreement (conditionality) for proper and sustainable progress of the sector loan project and conducted the feasibility studies on comprehensive flood mitigation for core areas composed of applicable structural and non-structural measures for three river basins based on the analysis of existing/future conditions and problems in the areas. The report consists of summary, Part-I: Main Report, Part-II: Feasibility Studies, and Needs Assessment Study on Flood Disaster caused by Typhoon Ondoy and Pepeng.

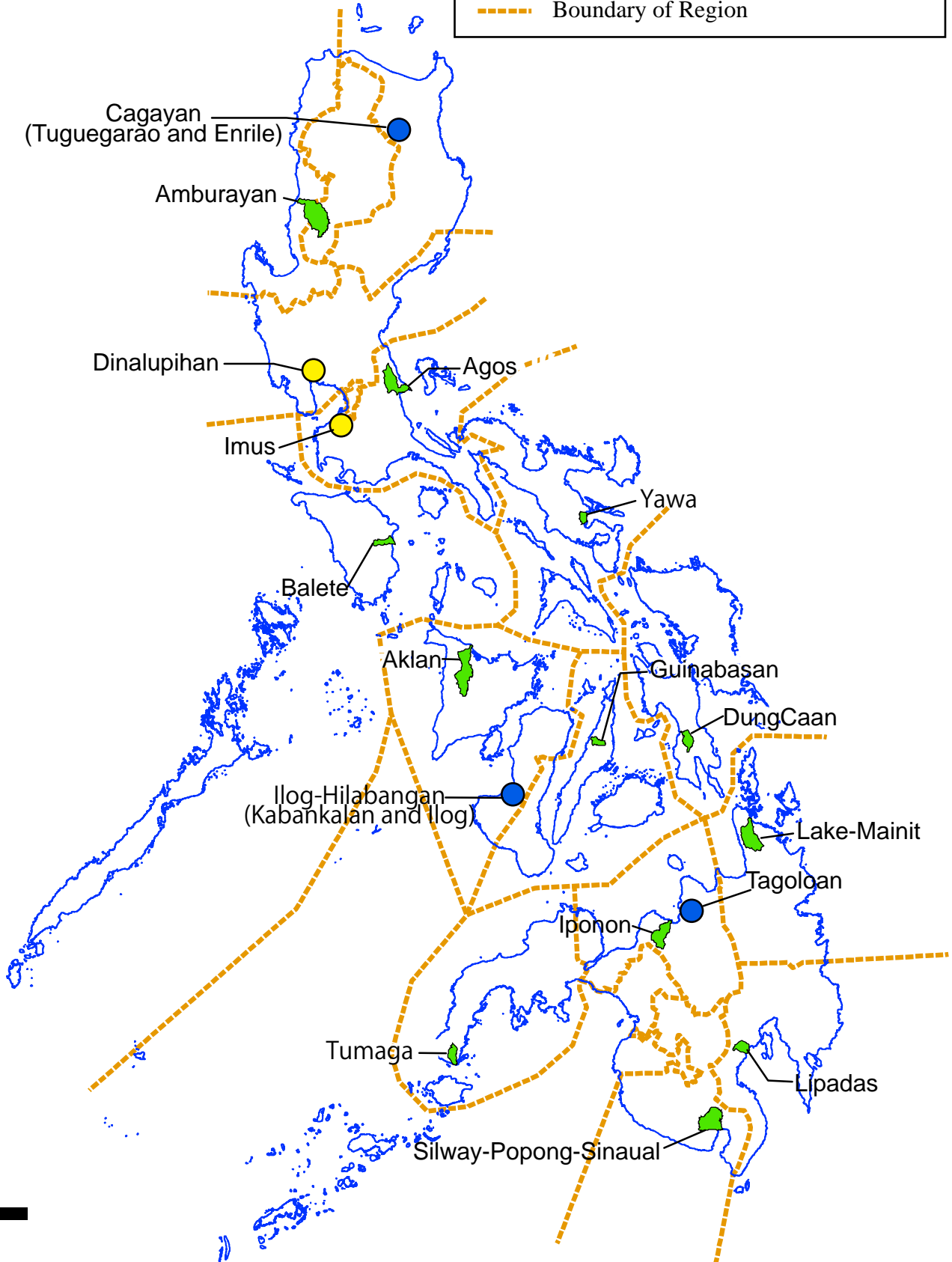
On this occasion the Study Team would like to express its sincere appreciation to JICA, the Ministry of Foreign Affairs, and also to the officials concerned of the Government of the Republic of the Philippines, and the Local Government Units (LGUs) concerned for the cooperation extended to the Team during the Study. We sincerely hope that the results of the Study will contribute to the commencement of the sector loan project and mitigation of flooding problems in the Philippines and that the amicable relationship between both our countries will further continue in the future.

Very truly yours,

YOSHIHARU MATSUMOTO
Team Leader
The Preparatory Study for Sector Loan on
Disaster Risk Management

LEGEND

- 3 River Basins Selected for F/S
- 12 F/S River Basins by DPWH FCSEC
- Other River Basins in Short List
- - - Boundary of Region



0 100 200 Km

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Flood Control Project for the Sector Loan
Application**

**Part II-B : Feasibility Study on the Ilog Hilabangan River
Flood Control Project for the Sector Loan
Application**

**Part II-C : Feasibility Study on the Tagoloan River Flood
Control Project for the Sector Loan Application**

**Needs Assessment Study on Flood Disasters Caused by
Typhoons No.16 (ONDOY) and No.17 (PEPENG)**

**THE PREPARATORY STUDY
ON SECTOR LOAN
FOR DISASTER RISK MANAGEMENT
IN THE REPUBLIC OF THE PHILIPPINES**

FINAL REPORT

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1 INTRODUCTION

1.1 Objective of the Sector Loan Project on Disaster Risk Management

The objective of the sector loan project are to strengthen the capability of Philippine Government agencies concerned on disaster risk management and to mitigate flood damages in the vulnerable areas through the following:

- (1) Implementation of structural and non-structural measures for the improvement of rivers in high-risk flood damage areas. Such rivers are based on the results of the “Study on the Nationwide Flood Risk Assessment and the Flood Mitigation Plan for the Selected Areas in the Republic of the Philippines.”
- (2) Improvement of disaster risk management systems including fund management of emergency response for flood control.

1.2 The Study Area

The Study shall cover the whole country.

1.3 The Study Schedule

The study schedule is as shown in the chart below. The study was started in the beginning of March 2009 in a manner of Home Work that followed the Field Survey Work, and work in the Philippines continued until the middle of November, 2009.

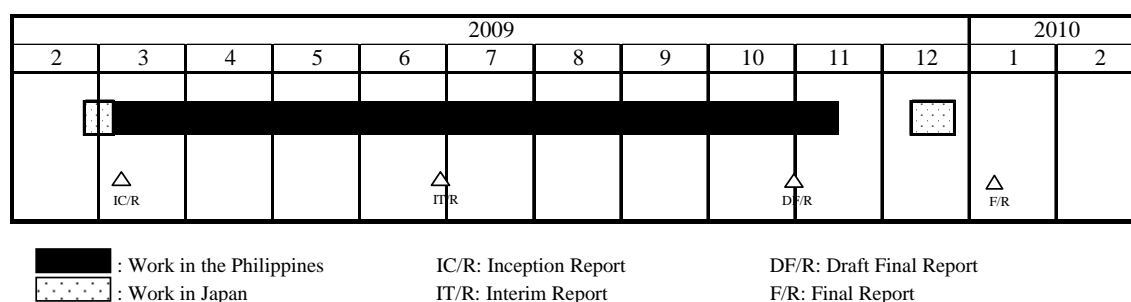


Figure R 1.1 Study Schedule, JICA, 2009-2010

1.4 Composition of the Final Report

The Final Report containing the objectives listed above was submitted as the final product of “The Preparatory Study for Sector Loan on Disaster Risk Management in the Republic of the Philippines.” The Final Report consists six (6) volumes, as follows:

Table R 1.1 Composition of the Final Report

Volume No.	Title	Contents
	Summary	Summary of the results of the whole Study
Part I	Main Report	Results of the whole study and the framework and implementing strategy, manner, cooperative agreement and procedure of the Sector Loan.
Part II-A	Feasibility Study on the Lower Cagayan River Flood Control Project for the Sector Loan Application	Results of the review on the Feasibility Study conducted in 2002 and the Structural and Non-structural Measures in the Project Proposed for Sector Loan.
Part II-B	Feasibility Study on the Ilog-Hilabangan River Flood Control Project for the Sector Loan Application	Results of the review on the Master Plan of 1990 and the results of Feasibility Study on the Project Proposed for Sector Loan
Part II-C	Feasibility Study on the Tagoloan River Flood Control Project for the Sector Loan Application	Results of the review on the Master Plan of 1982 and the results of Feasibility Study on the Project Proposed for Sector Loan.
-	Needs Assessment Study on Flood Disasters Caused by Typhoons No. 16 (ONDOY) and No. 17 (PEPENG)	

2 MANNER AND ISSUES ON PREVIOUS APPROACH TO THE SECTOR

2.1 Manner of Previous Approach

In general, disaster risk management, especially regarding flood control projects, is handled in the following manner:

- Filing of individual applications for ordinary loan (individual loan/stand-alone project) for each river basin.
- Formulation of Master Plan (M/P) for the whole river basin and conduct of F/S for the urgent components.
- Implementation of river improvement from river mouth to upstream.

In principle, structural measures are applied for damage mitigation, although non-structural measures are also examined and recommended for adoption.

2.2 Issues on Previous Approach

2.2.1 Composition of Issues

Several issues on the previous approach have been pointed out by the previous studies. They may be broadly expressed as the core issue and causes, as shown in the following figure.

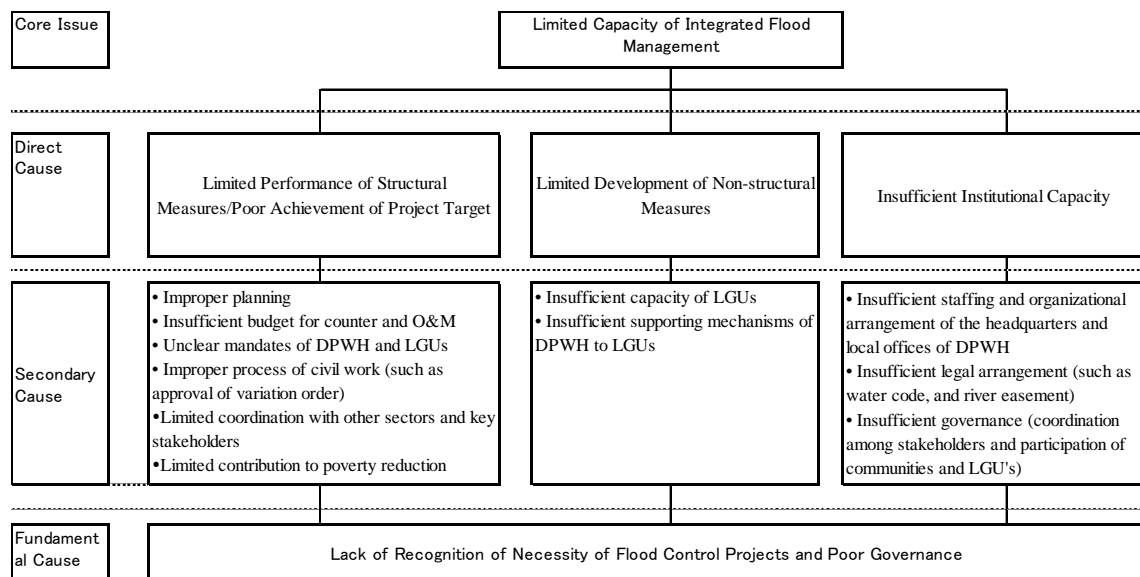


Figure R 2.1 Relation between Core Issue and Causes

2.2.2 Core Issue and Direct Causes

As shown in the figure above, the core issue on sufficient disaster management is attributed to the “Limited Capacity of Integrated Flood Management,” which requires full performance of structural measures and satisfactory achievement of the project goal, together with enough development of non-structural measures under sufficient institutional capacity. The major direct causes of the core issue are considered as the “limited performance of structural measures/poor achievement of project goal,” “limited development of non-structural measures” and “insufficient institutional capacity.”

2.2.3 Secondary Causes of the Core Issue

As the secondary causes, the following are pointed out:

(1) Secondary Cause of “Limited Performance of Structural Measures/Poor Achievement of Project Goal

As for the secondary causes of “limited performance of structural measures/poor achievement of project goal,” the following items are concerned:

- Improper planning
- Insufficient budget for countermeasures and O&M
- Unclear mandates of DPWH and LGUs
- Improper processing of civil works (such as approval of variation orders)
- Improper resettlement planning and measures
- Limited coordination with other sectors and key stakeholders
- Limited contribution to poverty reduction

(2) Limited Development of Non-structural Measures

As for the secondary causes of “limited development of non-structural measures,” the following items are concerned:

- Insufficient Capacity of LGUs
- Insufficient Supporting Mechanism of DPWH to LGUs

(3) Insufficient Institutional Capacity

As for the secondary causes of “insufficient institutional capacity,” the following items are concerned:

- Insufficient staffing and organizational arrangement of the head office and local offices of DPWH
- Insufficient legal arrangements (such as water code and river easement)
- Insufficient governance (coordination among stakeholders, and participation of communities and LGUs)

2.2.4 Fundamental Cause of the Core Issue

The fundamental cause of the core issue seems to be rooted on the lack of recognition of necessity of flood control projects and poor governance among the stakeholders, including the local residents.

2.2.5 Key to Successful Flood Management

For a successful flood management, the significance of recognition has been pointed out in the IWRM Guidelines recently published by the UNESCO to facilitate the practical implementation of Integrated Water Resource Management (IWRM) at the river basin level. The IWRM Guideline provides the following statement: “A key for success to flood management is a key that can be used in practice to help make IWRM succeed. They are keys to establishing breakthroughs in challenging situations, or to opening the door for better IWRM. They provide tips and clues for making progress in the IWRM process.” (See the following figure.)

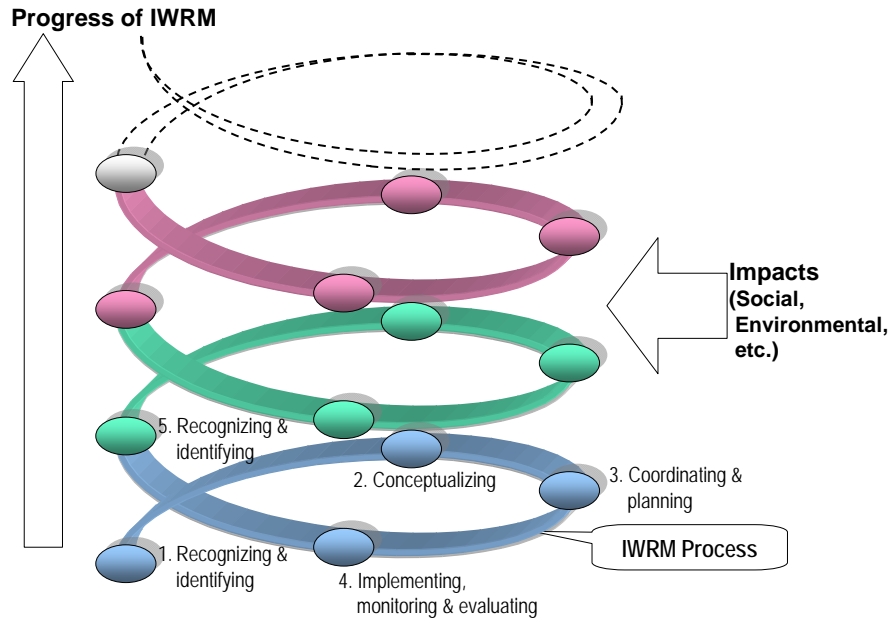


Figure R 2.2 IWRM Spiral

3 IMPROVEMENT BY NEW APPROACH THROUGH INTRODUCTION OF SECTOR LOAN

3.1 Target Issues and Directions for Improvement

The Table below shows the target issues nominated to be improved and the directions for improvement (Refer to **Figure 3.1**).

Table R 3.1 Core Issues, Causes and Directions on Disaster Risk Management

Item	Contents	Direction to Improve
Core Issue	Limited Capacity of Integrated Flood Management	Enough Capacity of Integrated Flood Management
Direct Cause	Limited Performance of Structural Measures/Poor Achievement of Project Target	Enough Performance of Structural Measures/Full Achievement of Project Target
	Limited Development of Non-structural Measures	Enough Development of Non-structural Measures
	Insufficient Institutional Capacity	Sufficient Institutional Capacity
Secondary Cause	Limited Performance of Structural Measures/Poor Achievement of Project Target	Enough Performance of Structural Measures/Poor Achievement of Project Target
	Improper Planning	Proper Planning
	Insufficient budget for counter and O&M	Sufficient budget for counter and O&M
	Unclear mandates of DPWH and LGUs	Clear mandates of DPWH and LGUs
	Improper process of civil works (such as approval of variation order)	Proper process of civil works (such as approval of variation order)
	Improper resettlement planning and measures	Proper resettlement planning and measures
	Limited coordination with other sectors and key stakeholders	Enough coordination with other sectors and key stakeholders
	Limited contribution to poverty reduction	Enough contribution to poverty reduction
	Limited Development of Non-structural Measures	Enough Development of Non-structural Measures
	Insufficient capacity of LGUs	Sufficient capacity of LGUs
	Insufficient supporting mechanisms of DPWH to LGUs	Sufficient supporting mechanisms of DPWH to LGUs
	Insufficient Institutional Capacity	Sufficient Institutional Capacity
	Insufficient staffing and organizational arrangement of the headquarters and local offices of DPWH	Sufficient staffing and organizational arrangement of the headquarters and local offices of DPWH
Insufficient legal arrangement (such as water code)	Sufficient legal arrangement (such as water code)	
Insufficient governance (coordination among stakeholders, an participation of communities and LGUs)	Sufficient governance (coordination among stakeholders, an participation of communities and LGUs)	
Fundamental Cause	Lack of Recognition of Necessity of Flood Control Projects and Poor Governance	Enough Recognition of Necessity of Flood Control Project and Good Governance

3.2 Basic Technical Approach for the Sector Loan

In the sector loan, the following technical approaches are employed:

- Feasibility study is conducted for the core areas, which are selected by referring to on-going or previous master plans.
- Flood control project of structural measures is implemented for the protection of core areas.
- Non-structural measures are implemented to alleviate flood damage in the core areas and the other areas except core areas.

3.3 Basic Tools Utilized for Improvement

To improve the above issues, the introduction of the following tools is considered:

- Introduction of Sector Loan with Cooperative Agreement (commitment by the Philippine side)
- Allocation of Disaster Rehabilitation Fund (DRF)

- Introduction of Technical Assistance Program

In principle, the improvement of previous issues on disaster risk management will be promoted through the implementation of flood control projects (sub-projects) utilizing these tools, realization of cooperative agreement, the operation of DRF and the activities on T/As. The relation between sub-projects and these tools may be broadly expressed as follows:

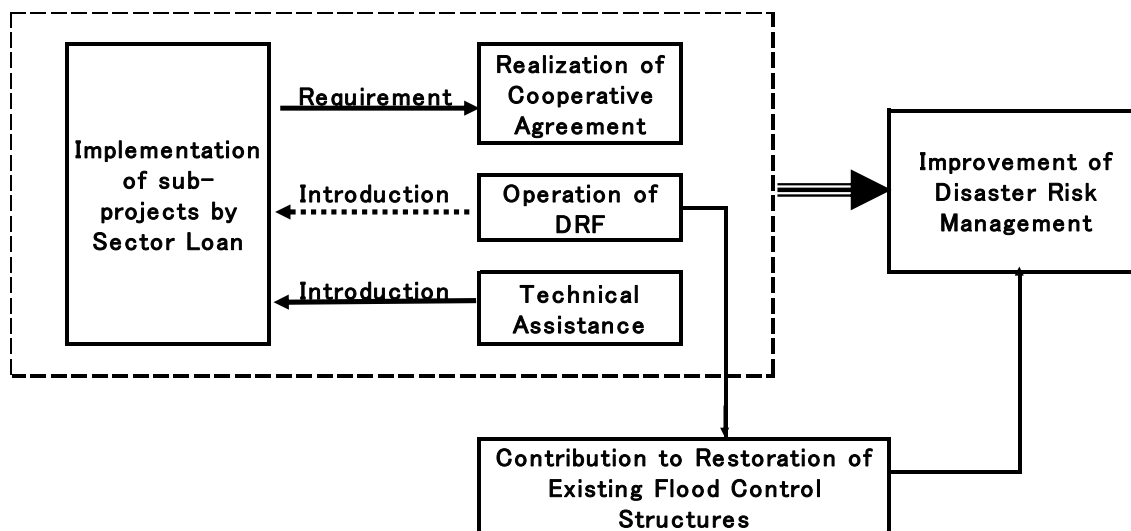


Figure R 3.1 Relation between the Implementation of Sub-Projects and the Tools for Improvement of DRM

Among these tools, the realization of cooperative agreement and technical assistance are directly related to the implementation of sub-projects, and the improvement of disaster risk management can be achieved through the implementation of sub-projects, as well as the implementation of other flood control projects in the future.

On the other hand, the operation of DRF will mainly contribute to the restoration of existing structures provided by previous flood control projects, and may partially or indirectly relate to the implementation of sub-projects. With the continuation of the DRF system, the tool will contribute to the improvement of disaster risk management.

3.4 Expected Investment Amount, Phasing of Sector Loan and ICC Process

3.4.1 Expected Investment Amount

In principle, the availability of Sector Loan will be finalized through the identification of sub-projects to be covered. The provisional amount, which is around 200 million US dollars including the “Disaster Rehabilitation Fund (DRF),” was implied in the meeting between the DPWH and the JICA Study Team with the participation of the JICA Advisory Team on March 6, 2009.

3.4.2 Phasing of Sector Loan

In the same DPWH and JICA Study Team meeting mentioned in 3.4.1, the following conditions were also implied:

- The sector loan is to be disbursed for three (3) batches of projects.
- The number of river basins to be included in one batch is approximately three (3).
- The river basins covered in the first batch are possibly those where F/S were conducted in this Preparatory Study.

3.4.3 ICC Process

For project implementation in the Philippines, approval of the NEDA-ICC Board (Investment Coordination Committee) is required with the presentation of necessary documents related to the project. Through the discussions with the agencies concerned (NEDA, DPWH and JICA), the umbrella-type of ICC was, in principle, accepted for the ICC approval, as follows:

- For the first batch, completed feasibility studies (F/S) are necessary.
- For the second and third batches selected from short-listed projects, only project features with preliminary project cost and indicative economic analysis are required considering that these will be subjected to ICC evaluation after the completion of the respective F/S.
- Reprioritization among the short-listed projects may be possible for as long as the short list is justified.

The image of the framework is shown in **Figure R 3.2** below.

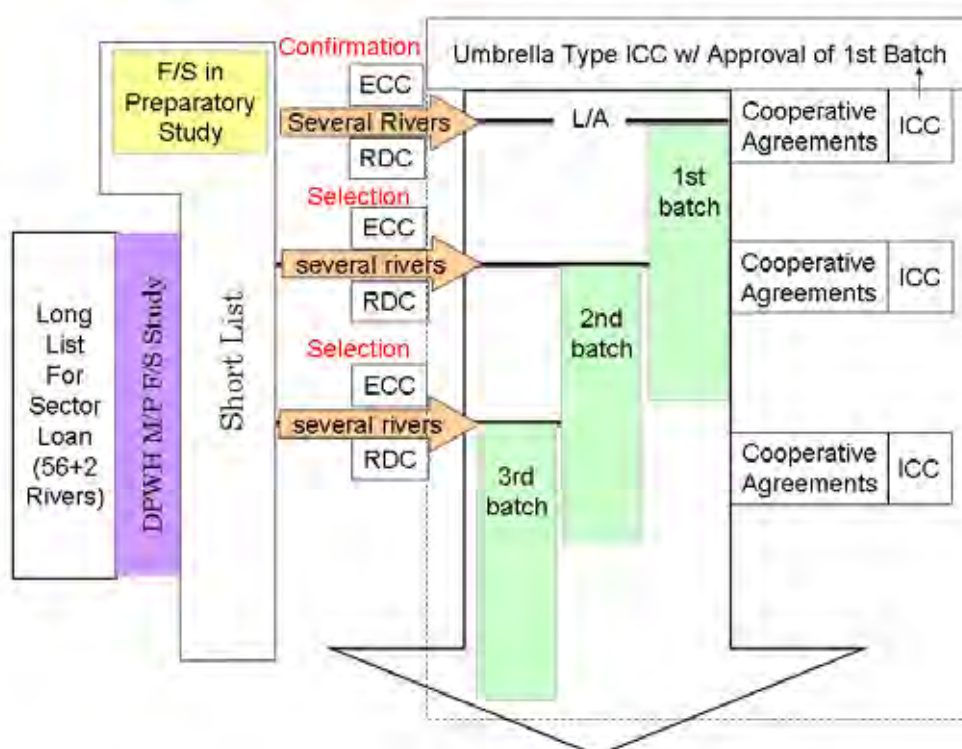


Figure R 3.2 Image of Framework of the Sector Loan Project

3.5 Preparation of Cooperative Agreement

The following four (4) items are to be prepared in terms of a cooperative agreement on the application of sector loan subject to the continued discussions between JICA and DPWH with agencies concerned related to the detailed items of cooperative agreement and their stages/timings till loan appraisal:

- Strengthening of DPWH capacity (PS, FCSEC and Local Offices)
- Strengthening of Management System for DRF, QRF and GAA
- Development of Non-structural Measures (DPWH's Supporting Mechanism to LGUs)
- River Basin Governance, including the Establishment of Project Process (Participatory Planning and Resettlement Planning, ICP and River Basin Forum; involvement of LGUs and Communities throughout the Project Cycle) and Coordination with LGUs

and other organizations in the form of a Memorandum of Agreement (MOA) on Operation and Maintenance (O&M), River Basin Management and Environmental Improvement.

The relation between the directions for improvement mentioned earlier and the conceivable cooperative agreement is as illustrated in the following figure:

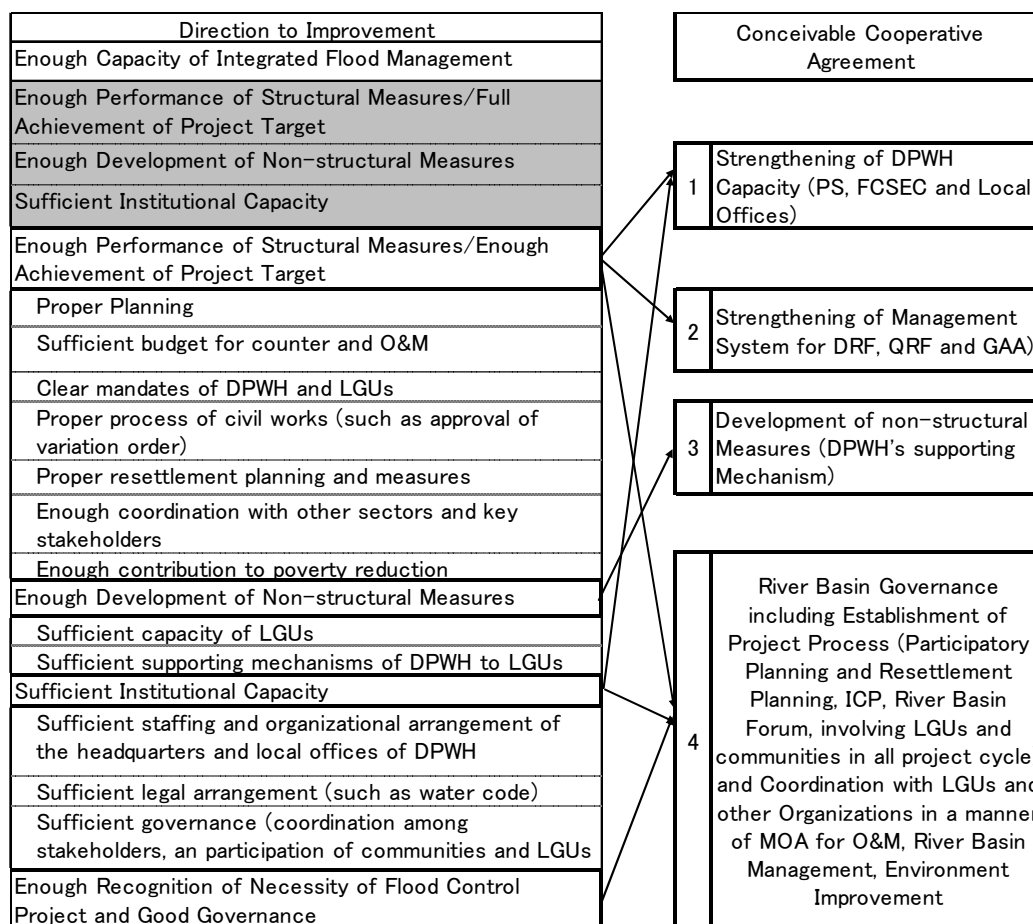


Figure R 3.3 Relation between the Direction for Improvement and Conceivable Cooperative Agreement

3.5.1 Strengthening of DPWH Capacity (PS, FCSEC and Local Offices)

The contents and timing of realization of the cooperative agreement on the strengthening of DPWH capacity are as summarized in the following Table.

Table R 3.2 Contents of Cooperative Agreement and Timing of Realization related to Strengthening of DPWH Capacity

Contents of C/A	Agencies Responsible	Timing for Realization
1. ICD Set up (Clarification of Secretary, Member, Role and Budget)	DPWH H.Q.	by preparation of ICC Doc.
2. Formulation of PDM for T/A (incl. Request of Introduction of Expert)		by preparation of ICC Doc.
3. Issuance of Department Order for Permanency of ICD		by Appraisal
4. Formulation of DPWH Strategy Action Plan for Strengthening of Capacity for Flood Management including Time Schedule		by Appraisal
5. Proposal on Permanency of FCSEC (Request to DBM)		by L/A
6. Confirmation of Activity for Realization of DPWH Strategy		*1
6.1 Preparation of Manual on Climate Change for Flood Control		by JICA Concurrence at the Commencement of D/D for the Second Batch
6.2 Revision of Typical Drawings of River Structures		by JICA Concurrence at the Commencement of D/D for the Second Batch
6.3 Revision of Action Plan		by JICA Concurrence at the Commencement of D/D for the Third Batch
1. Clarification of Responsible Persons with the role/responsibilities and assurance of budget and staff in Local Office (Regional Offices and DEO)	DPWH. Local Offices	by Appraisal
2. Formulation of Strategy Action Plan for Strengthening of Capacity for Flood and River Management including Time Schedule		by Appraisal
3. Confirmation of Activity for Realization of strategy		
3.1 Establishment of River Section in each Regional Office and DEO		by JICA Concurrence at the Commencement of D/D for the Second Batch
3.2.1 Preparation of Database for Flood Control Structures by Each DEO (More than 50% of DEO will have prepared Database.)		by JICA Concurrence at the Commencement of Construction for the Second Batch
3.2.2 Preparation of Database for Flood Control Structures by Each DEO (All DEOs (100%) will have prepared Database)		by JICA Concurrence at the Commencement of Construction for the Third Batch

(Refer to Table 3.1 and 3.2)

Note: *1: These items are subject to Action Plan to be prepared by DPWH. Items in the table above are tentatively prepared based on proposed contents of T/As (See Tables 3.4 to 3.8.)

3.5.2 Strengthening of Management System for DRF, QRF and GAA

The contents and timing of realization of the cooperative agreement on the strengthening of the management system for the DRF, the QRF, and the GAA are as summarized in the following Table.

Table R 3.3 Contents of Cooperative Agreement and Timing of Realization related to Strengthening of Management System for DRF

Contents of C/A	Agencies Responsible	Timing for Realization
1. ICD Set up	DPWH-ICD	by preparation of ICC Doc.
2. Drawing the Concept and Plot of Utilization of DRF, QRF and GAA Formulation of PDM for T/A		by ICC-TB Approval
3 Approval by NEDA (Approval of Sector Loan incl. DRF)		by ICC-TB Approval
4. Confirmation of Availability of Special Account		by Appraisal
5. Clarification of Strategy for continuation of DRF and Legal Arrangement		by Appraisal
6. Issuance of Draft IRR for DRF Operation		by L/A
7. Confirmation of Action for continuation of DRF in accordance with the Concept, the Operation Rule and the Strategy		
7.1 Issuance of Revised IRR for Operation of DRF		by JICA Concurrence at the Commencement of D/D for the Second Batch
7.2 Utilization of Database for Application for DRF		by JICA Concurrence at the Commencement of D/D for the Third Batch
7.3 Securement of Budget for DRF for Continuation		by JICA Concurrence at the Commencement of Construction for the Third Batch

(Refer to Table 3.1 and 3.2)

3.5.3 Development of Non-Structural Measures (DPWH's Supporting Mechanism for LGUs)

The contents and timing of the realization of cooperative agreement on the Development of Non-Structural Measures (DPWH's Supporting Mechanism for LGUs) are as summarized in the following Table.

Table R 3.4 Contents of Cooperative Agreement and Timing of Realization related to Development of Non-Structural Measures

Contents of C/A	Agencies Responsible	Timing for Realization
1. Clarification of Responsible Persons in DPWH	DPWH H.Q.	by Appraisal
2. Preparation of Strategy for supporting system to LGUs and Formulation of PDM for T/A		by Appraisal
3. Preparation of Manual and Guideline for introduction of Non-structural Measures		by JICA Concurrence at the Commencement of Construction for the First Batch
4. Set-up Flood management committee including DPWH, LGUs and other agencies for each Batch.	DPWH, LGUs and Other agencies	by Appraisal for First Batch
5. Setup and Commencement of Operation of Non-structural Measures for River Basins in each batch		by ICC-TB Approval for Second Batch
		by ICC-TB Approval for Third Batch
6. Revision and Improvement of Manual on Non-structural Measures		Non-structural measures for First Batch will be operated for JICA Concurrence at the Commencement of Construction for the Second Batch
	Non-structural measures for Second Batch will be operated for JICA Concurrence at the Commencement of Construction for the Third Batch	
	by JICA Concurrence at the Commencement of Construction for the Third Batch	

(Refer to Table 3.1 and 3.2)

3.5.4 River Basin Governance including Establishment of Project Process and Coordination with LGUs and other Organizations in the form of MOA on O&M, River Basin Management and Environmental Improvement

The contents and timing of realization of the cooperative agreement on river basin governance are as summarized in the following Table.

Table R 3.5 Contents of Cooperative Agreement and Timing of Realization related to River Basin Governance

Contents of C/A	Agencies Responsible	Timing for Realization
1. ICD Set up (Clarification of Secretary, Member, Role and Budget)	DPWH H.Q.	by preparation of ICC Doc.
2. Formulation of PDM for T/A		by preparation of ICC Doc.
3. Guideline for River Basin Governance including Establishment of Project Process (Participatory Planning and Resettlement Planning, ICP, River Basin Forum involving LGUs and Communities in whole Project Cycle)		
3.1 Preparation of Guideline		by Appraisal
3.2 Issuance of Department Order for Guideline for establishment of Project Process		by Appraisal
4. Sample MOA for O&M, River Basin Management and Environmental Improvement		
4.1 Preparation of Sample MOA		by ICC-TB Approval for First Batch
4.2 Issuance of Department Order of Sample MOA		by ICC-TB Approval for First Batch
4.3 Issuance of Revised Department Order of Guideline and Sample MOA		by ICC-TB Approval for Third Batch
5. Holding of Seminar on River Administration in the Philippines		by JICA Concurrence at the Commencement of D/D for the Third Batch
6. Set-up of Flood Management Committee for implementation of sub-projects for First Batch, Second Batch and Third Batches	DPWH, LGUs and Other agencies	by ICC-TB Approval for First Batch
		by ICC-TB Approval for Second Batch
		by ICC-TB Approval for Third Batch
7. Finalization of MOA for Sub-projects for First Batch, Second Batch and Third Batches		by ICC-TB Approval for First Batch
		by ICC-TB Approval for Second Batch
	by ICC-TB Approval for Third Batch	
8. Proposed Draft of New River Act or Revision of Water Act to Congress and Senate		by JICA Concurrence at the Commencement of D/D for the Third Batch

(Refer to Table 3.1 and 3.2)

The contents of action and timing of realization of the overall cooperative agreement are also shown in **Table 3.1** and **3.2**.

3.6 Disaster Rehabilitation Fund (DRF)

3.6.1 Issues on the Current Situation of Restoration Work and the Necessity of DRF

As discussed in the preceding subsection, the restoration work on damaged flood control structures are undertaken at a certain level, but the following issues have been detected through this Study:

- Budget for restoration work is not enough.
- Effective utilization of current funds could not be identified.

To improve the situation, it is necessary to allocate enough funds for the restoration work, together with the preparation of a guideline on the utilization of such fund.

Although the amount allocated for the DRF may not be enough to cover all restoration works, it may trigger the arrangement of a guideline, as well as sufficient funds for the purpose by the Philippine Government. With such an objective, it is necessary to introduce the DRF in the context of improvement of the issues pointed out in previous disaster risk management systems.

3.6.2 Necessary Arrangements for the Introduction of DRF

For the introduction of DRF, the following arrangements are, in principle, necessary:

- Organization Responsible for Management of the DRF

- Extent of Utilization of the Fund (Applicable Facilities, Activities and Type of Calamity)
- Basic Procedures for Utilization of the DRF

(1) Organization Responsible for Management of the DRF

As discussed in the preceding sections, the organization for management of the sector loan; namely, the “Institutional Capacity Development Team/Task Force (ICD Team),” was, in principle, accepted in the Steering Committee (SC) meeting, where the DRF is to be managed by the BOM as a member of the said ICD Team (refer to **Figure 3.2**).

(2) Extent of Utilization of DRF

(a) Applicable Type of Calamity

Application of the DRF shall be initially based on bulletins or reports from regional offices and finally be judged by the organization for management of the DRF in accordance with the Damage Report through research activities conducted by staffs in the organization assigned from the staffs of the Planning Service and the FCSEC of DPWH as shown in **Figure 3.2**. In this regard, the implementing rules and regulations for the Fund (IRR) shall be promulgated prior to utilization of the Fund. The promulgation of the IRR is to be assisted and supported under the Technical Assistant Activities (T/A) proposed in Section 4.3.

(b) Applicable Facilities

The current budget for restoration work, such as the National Calamity Fund (NCF) and the Quick Response Fund (QRF), are unfortunately insufficient due to cumulative calamities.

In this connection, the Disaster Rehabilitation Fund (DRF) in the Sector Loan for Disaster Risk Management should basically concentrate on the rehabilitation and restoration of damaged flood control facilities unless otherwise directed with the approval or concurrence of JICA and NEDA prior to the rehabilitation work (refer to **Table 3.3**).

(c) Applicable Activities

It is essential, for river and flood control facilities, to evaluate the causes of collapse or damage. Therefore, research activities are mandatory expenses. Based on the evaluation and causes of collapse, the recovery design concept or adoption of typical repair works for damaged structures should also be imperative to minimize the expenses and to lengthen the life of rehabilitated structures. In addition, estimates of proper contract costs are vital.

In view thereof, sudden expenditures induced by research, creation of design concept enumerated in **Table R 3.6** may be chargeable from, but not limited to, the budget of the T/A and the DRF when the DPWH budget is insufficient.

Table R 3.6 Applicable Activities to be shouldered by the T/A or DRF when DPWH Budget is Insufficient

Item	Research, Design and Cost Estimate	Implementation
Applicable Activities	<ul style="list-style-type: none"> • Trip Expense for research and design by Task Force Member • Topographic Survey/Cross Section Survey, if necessary • Soil Investigation Survey 	<ul style="list-style-type: none"> • Construction Cost • Trip Expense for inspection by Task Force Member
Implementation	Newly Established Organization for Institutional Capacity Development (ICD)	Basically, all construction costs shall be shouldered by the DRF.

(d) Basic Procedures for Utilization of the DRF

As shown in **Figure 3.2**, research for clarification of damaged structures including discussion with administrative offices (DEO/LGUs) and the determination of rehabilitation policy will be conducted by the established organization in cooperation with the proposed T/A. On the other hand, detailed design for recovery/rehabilitation, as well as cost estimation, will be conducted by the consultants supervising the sub-projects in association with the BOD of DPWH.

Application of the DRF shall be coordinated with the other fund releases in case the calamity statement is issued by the national government offices (the President, etc.) headed by the BOM.

3.7 Introduction of Technical Assistance Program

The following five (5) Technical Assistance Activities (T/A) are proposed.

- Assistance on the Setup of Non-Structural Measures
- Capacity Building for DPWH
- Advice on Legal System Arrangement for River Administration
- Setup of Mechanism of Utilization of Disaster Rehabilitation Fund (DRF)
- Advice on Collection System Arrangement for O&M Budget, and Capacity Development on Drainage Improvement

The contents of these technical assistance programs are outlined based on necessity, target and expected activities as discussed in the subsections below, and the detailed contents are described in **Table 3.4** to **Table 3.8**.

3.7.1 Strengthening of DPWH Capacity

(1) Necessity of Technical Assistance Program

The following issues regarding DPWH capacity have been identified:

- Insufficient capacity on disaster risk management as well as river management
- Insufficient budget for the implementation of disaster risk management

(2) Target

(a) Overall Target

The overall target of this technical assistance is to strengthen the organization for implementation, i.e., the capacity of DPWH on disaster management shall be strengthened through the enhancement of capacity of PS and FCSEC.

(b) Program Target

As the program target, the following achievements are expected:

- River engineers in DPWH (PS and FCSEC) can formulate flood control plans through participation in project formulation activities for several river basins.
- River engineers in DPWH (PS and FCSEC) can obtain knowledge on several kinds of river structures and acquire the capacity to design such structures.
- Contents of database and manuals are consolidated and utilized nationwide.

(3) Expected Activities in this Program

In this program, the following activities are expected as the input:

- Training of river engineers in DPWH to strengthen their capability on project formulation, research and design of river structures
- Improvement of manual for river planning
- Preparation of manual for climate change
- Preparation of manual for the estimation of project benefit
- Preparation of database for the design of river structures
- Preparation of database on good and bad examples based on previous experiences
- Setup of collection system for nationwide hydrological and hydraulic data

The Work Breakdown Structure (WBS) for this program, including input of experts from international cooperation agencies, is shown in **Table 3.4**.

3.7.2 Setup of Mechanism for Utilization of DRF

(1) Necessity of Technical Assistance Program

The Disaster Rehabilitation Fund (DRF) is to be introduced and basic ideas for the setup of an exclusive task force/team (ICD), together with the operation rules of management of the DRF in DPWH are recommended. However, it is necessary to have further discussions to finalize the form of the task force/team and the operation rules of management of the DRF, which may take a long time if the discussion is made only among the officials within the DPWH, because they may be affected by their own intentions.

Therefore, in order to obtain neutral ideas of outside experts and accelerate the setup, it is recommended that the technical assistance program should be introduced.

(2) Overall Target and Program Target

(a) Overall Target

The overall target is for the flood control facilities to function sufficiently to fulfill the designed purpose through appropriate and prompt restoration works with the effective utilization of the DRF.

(b) Program Target

As the program target, the following outputs are expected:

- Utilization of DRF through appropriate rules and guidelines
- Selection of appropriate structures and design with reasonable cost of restoration among damaged structures
- Prompt implementation of restoration works through the timely release of DRF
- Enhancement of technical knowledge on restoration work as well as O&M

(3) Expected Activities in this Program

The following activities are to be introduced in the program:

- Review and identification of issues on the current operation rule and the organization for similar funds (QRF and GAA)
- Preparation of manual for O&M records and reports
- Preparation of database for river structures
- Preparation of manual for research, planning, design, construction method and cost estimate for damaged river structures

The Work Breakdown Structure (WBS) for this program, including the input of experts from international cooperation agencies, is shown in **Table 3.5**.

3.7.3 Introduction of Non-Structural Measures

(1) Necessity of Technical Assistance Program

The following issues have been identified:

- Introduction of non-structural measures is indispensable to the application of sector loan, since the sector loan concept is to protect only the core areas and not the whole river basin from flood damage through structural measures so that there will exist areas not protected by the structural measures.
- Introduction and operation of non-structural measures are the responsibilities of LGUs. However, the LGUs and even DPWH are facing the shortage of river engineers to arrange such non-structural measures.

Under the circumstances, it is imperative to utilize experts from international cooperation agencies to assist in providing the non-structural measures for the mitigation of flood damage.

(2) Overall and Program Targets

(a) Overall Target

The overall target of technical assistance is to mitigate disaster risk in the Philippines through the introduction of non-structural measures.

(b) Program Target

The program target is for the LGUs in the F/S areas to capably operate the non-structural measures to be provided at their own responsibility.

(3) Expected Activities in this Program

In this program, the following activities are expected in the selected F/S areas:

- Identification of causes of flood damage and flood vulnerable areas
- Selection of suitable non-structural measures
- Introduction of selected non-structural measures
- Training and announcement on the operation of non-structural measures
- Land Use Control / Designation of Flood Risk Area into Urban Planning

The Work Breakdown Structure (WBS) for this program, including the input of experts, is shown in **Table 3.6**.

3.7.4 Advice on Legal System Arrangement for River Administration

(1) Necessity of Technical Assistance Program

As discussed earlier, identified in the Study was the insufficient legal arrangement, and only the Water Code contains some provisions on river administration. The situation is attributable to the following issues:

- Unclear definition of administration of rivers
- Unclear definition of easement of river bank
- Inconsistency of other laws and regulations

The issue on river administration may take a long time to resolve since legal arrangements are indispensable for its solution. To mitigate this issue, it is necessary for the DPWH to step forward as early as possible and, for the purpose, it is necessary for it to make arrangements for the utilization of experts through technical cooperation from international cooperation agencies.

(2) Overall and Program Targets

(a) Overall Target

The overall target of this technical assistance is to assure the sustainability of the disaster risk management system in the country.

(b) Program Target

The program target is to introduce the legal system where river administration can be successfully pursued without any confusion among water related agencies.

(3) Expected Activities in this Program

In this program, the following outputs are expected:

- Recognition of issues on river administration among the stakeholders
- Recognition of necessity of disaster management in the Philippines
- Setup of strategy for river administration in the Philippines
- Recognition of other issues related to river administration and climate change

To obtain these outputs, the following activities are to be undertaken:

- Study on current roles and functions on river administration of the agencies concerned
- Study on issues related to the current legal system for river administration
- Study on directions to settle the current issues
- Collection and compilation of information on legal systems applied in other countries
- Collection and compilation of information on measures related to climate change taken by other countries
- Study on measures to cope with climate change in the Philippines

The Work Breakdown Structure (WBS) for this program, including the input of experts from international cooperation agencies, is shown in **Table 3.7**.

3.7.5 Advice on Collection System Arrangement for O&M Funds

(1) Necessity of Technical Assistance Program

As discussed earlier, the following issues were pointed out in connection with the success of disaster risk management by the LGUs:

- Not enough O&M for flood control facilities due to shortage of budget
- Not enough management of drainage system due to shortage of engineers and technical knowledge

It has to be mentioned in this connection that, although the responsibility for O&M of flood control facilities and construction and management of drainage system is burdened to the LGUs, the capacity to implement the work is very much affected by the shortage of staff and budget. Since it is essential to improve the situation in order to achieve the target for a successful disaster risk management, it is necessary to introduce technical assistance from international cooperation agencies.

(2) Overall and Program Targets

(a) Overall Target

The overall target of this program is to assure the success of disaster risk management in the Philippines.

(b) Program Target

The program targets are to assure the O&M for flood control facilities and to enhance the capacity of LGUs on the construction and management of drainage facilities.

(3) Expected Activities in this Program

In this program, the following activities are to be undertaken:

- Study on revenue and budgetary allocation of LGUs for disaster risk management as well as O&M
- Study on necessary budget for O&M of river structures
- Study and preparation of manual on funding source for O&M
- Preparation of O&M manual and execution of O&M for river structures
- Enhancement of capacity for research, planning, detailed design and O&M for drainage facilities

The Work Breakdown Structure (WBS) for this program is shown in **Table 3.8**.

4 PREPARATION FOR THE IMPLEMENTATION OF FLOOD CONTROL PROJECT (SUB-PROJECTS) APPLYING THE SECTOR LOAN

4.1 Arrangement of the Long and Short Lists of Sub-Projects for the Sector Loan

One of the main objectives of the Sector Loan is to implement the flood control works, which will be divided into three (3) batches as sub-projects in the core areas. The sub-projects to be implemented were selected through the basic approaches described in the following Figure.

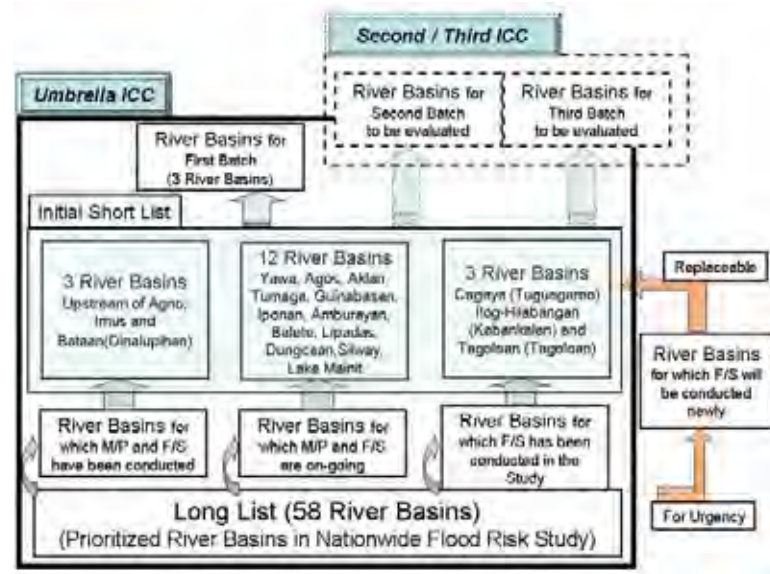


Figure R 4.1 Basic Approach for Implementation

4.1.1 Arrangement of Long List

Basically, the Sub-Projects to be implemented in the Sector Loan Project were selected from the Long List. The “Long List” means the list that contains the name of fifty-eight (56+2=58) river basins proposed and selected as priority areas for implementation of river improvement works or flood control projects during the period 2009-2034 in the Nationwide Flood Risk Study unless other areas are requested additionally by DPWH. These 58 river basins are listed in the attached Table 4.1 and Figure 4.1.

4.1.2 Arrangement of Short List

The “Short List” means the list that contains the name of candidate river basins and core areas with completed and/or ongoing feasibility studies but proposed to have river improvement works or flood control projects implemented as candidate sub-project components of the Sector Loan Project for Disaster Risk Management.

The Short List was created through several evaluation processes including the assumed implementation volume/cost, regional consideration, expected benefits and the consideration of assumed difficulties due to expected issues on ROW and house relocation activities that may cause the delay or suspension of the works.

In this connection, the process of establishment of the Short List was classified into the following three (3) categories:

- Category A: River Basins and Core Areas in which F/S has already been conducted in terms of urgency and strong requirements among stakeholders.
- Category B: River Basins and Core Areas in which M/P and F/S on river improvement works or flood control projects by DPWH are presently on-going.
- Category C: River Basins and Core Areas in which F/S was conducted in this Preparatory Study and expected to be the candidate river basins in the first batch.

As the result, seventeen (17) river basins were nominated to comprise the short list, as shown in the attached **Table 4.2**.

4.1.3 Procedure for the Selection of Sub-Projects

Certain Sub-Projects have been selected for each batch from the candidate river basins in the Short List described above. The proposed policies and order of prioritization as basis for the selection for each batch were as follows:

- Completion of F/S (ECC/CNC Issuance, RDC Approval)
- MOA together with the Compliance of the Cooperative Agreement by LGU
- Recommendation of EIRR higher than 15%
- Regional Distribution

Detailed procedures for the selection of Sub-Projects for each batch are described in the attached **Figure 4.2**.

4.2 Selection of Objective River Basins for F/S in the Preparatory Study

In parallel with the selection of sub-projects of the sector loan project, the selection of objective river basins for F/S in the preparatory study has been conducted in the following manner:

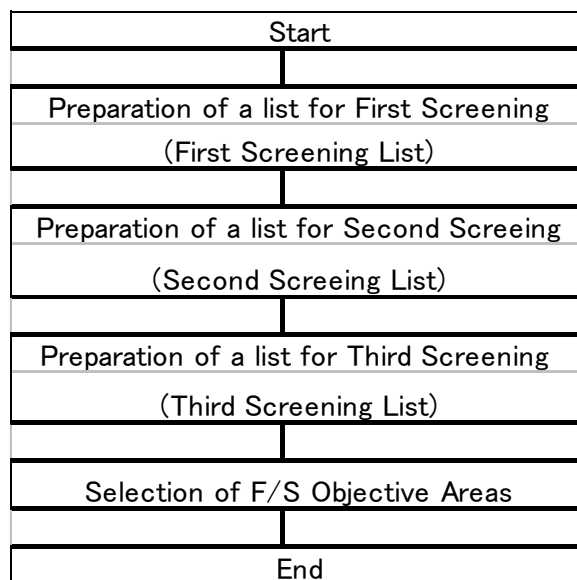


Figure R 4.2 Flow Chart of Selection of Objective River Basins for F/S

Three (3) objective river basins for F/S have been selected through the above procedure and the following considerations:

- First, TWG and Steering Committee meetings were held on April 20 and April 28, 2009, respectively. Through these meetings, the following river basins were selected for feasibility study in terms of prioritization in the Nationwide Flood Risk Assessment Study and regional distribution [See Appendix-2 in Report Part-I (Main Report)]

Table R 4.1 Three River Basins for F/S in the Preparatory Study

Region	Selected River Basin
Luzon	Cagayan
Visayas	Ilog-Hilabangan
Mindanao	Tagoloan

- Second, stakeholder meetings and field reconnaissance surveys were conducted for these river basins to confirm site conditions for the implementation of flood control projects. In these stakeholder meetings and field reconnaissance surveys, it was confirmed that the conduct of F/S has proceeded. (Refer to Section 5.3 to 5.6 for the status of F/S such as initial concepts for flood mitigation plan and methodologies. See Appendix-3 for the Minutes of the first stakeholders' meeting.)

4.3 Expected Schedule for Improvement of Disaster Risk Management by Sector Loan

In principle, the following activities are mainly mobilized with regard to the improvement of disaster risk management throughout the sector loan project after completion of the Preparatory Study:

- ICC approval
- Conclusion of Loan Agreement and Implementation of Sub-Projects
- Realization of Cooperative Agreement
- Operation of DRF (Disaster Rehabilitation Fund)
- Operation of Technical Assistance Program

The Preparatory Study is expected to terminate in January 2010, and the Draft Final Report on the Study was available in November 2009. In this connection, related actions toward the implementation of sub-projects can be mobilized after then. The expected schedule for the above activities is as shown in **Figure 4.3**.

4.4 Consideration for Climate Change

The Philippine climate is influenced by large-scale atmospheric phenomena that bring in substantial amounts of rainfall almost all year round. Recognizing the significance of the influence by climate change, the Philippine Government initiated the action to cope with the situation, which has been emphasized with the promulgation of the "Climate Change Act of 2009" (expected to be signed within this year 2010).

4.4.1 Expected Impact of Climate Change

The computed probable peak discharge and safety levels in return period would be changed in line with global warming; i.e., the changes of probable discharge would increase by 10 to 20% in 2050 and by 14 to 29% in 2100. As a result of the above increscent effects of flood discharge, the safety level of flood control structures would decrease in line with the progress of global warming. The safety level of 25-year is likely to decrease to 15- to 19-year in 2050 and to 11- to 17-year in 2100.

4.4.2 Basic Concept of Mitigation Measures against Climate Change

Thus, the global warming in climate change would have intensive impacts on flood control measures to be taken in the future. The process of global warming, however, still contains considerable uncertainty in scientific fields. Therefore, mitigation measures shall be formulated with careful deliberation on the decrease of secured safety level in temporal process and scientific progress in climate change. The basic concept of mitigation measures against hydrological effects in climate change could be summarized below.

(1) After Implementation of Urgent Flood Control Measures

After the implementation of urgent flood control measures, the secured safety level would decrease gradually in line with global warming. In this period, the following measures shall be taken until the effects of climate change are clarified in a scientific manner, and the flood mitigation and management master plan shall be revised through incorporating the effects of climate change:

- Establishment and strengthening of meteo-hydrological monitoring system;
- Strengthening of early warning dissemination system through PABC flood forecasting system;
- Establishment and improvement of flood preparedness and emergency response plan in each local level, city, municipality and barangay; and
- Strengthening of land use plan or control in due consideration of flooding situations and future flood mitigation measures.

(2) Formulation of Future Master Plan of Flood Risk Management

The future flood mitigation and management plan shall be formulated on the basis of predicted effects of future climate change.

5 SUMMARY OF FEASIBILITY STUDY

5.1 General

5.1.1 Selection of Optimum Flood Mitigation Plan

Three (3) river basins; namely, the Cagayan, Ilog-Hilobangan and Tagoloan river basins, have been selected for the F/S conducted in this Preparatory Study. The optimum flood mitigation plan for the three targeted areas as candidate sub-projects in the Sector Loan Project are as summarized below.

5.1.2 Core Areas to be Protected by Structural Measures in the Sector Loan Project

Flood control projects as sub-projects aim to alleviate flood damage in “core areas” in which the cities or municipalities play the role as center of economic, political and administrative activities in the basin or the development potential is higher than that of circumjacent areas.

5.2 Cagayan River Basin

5.2.1 Targeted Areas (Core Areas)

The candidate flood control structural measures proposed in the 2002 F/S are planned to be implemented in four (4) phases aiming at flood damage mitigation for four (4) areas in the Lower Cagayan River. Among these, Phase 4 for the protection of Tuguegarao City and the suburbs has been considered as a sub-project in the Sector Loan on Disaster Risk Management.

5.2.2 Proposed Structural Flood Mitigation Plan

(1) Summary of Structural Scheme to be Implemented under the Sector Loan

In the 2002 F/S, four (4) major flood control works were proposed for the Lower Cagayan River Flood Control Project; namely, 1) bank protection works; 2) dikes including maintenance roads and tree zones; 3) cut-off channels; and 4) related river structures such as culverts and sluices. However, the implementation of structural measures against a 25-year return period flood would require the construction cost of more than 6 billion pesos, which is not realistic to allocate under the Sector Loan.

Therefore, erosion prevention measures for the most critical erosion areas; namely, Alibago, Enrile and Cataggaman, were selected as viable structural measures. The main features and estimated costs of the erosion prevention works are as summarized below:

Table R 5.1 Summary of Project Components Proposed for Cagayan River Basin in the Sector Loan Project

Contents of Project	Quantity	Purpose of Project
Revetment at Alibago Area	L=900m	Erosion and Scouring Control
Revetment at Enrile Area	L=800m	Erosion and Scouring Control
Revetment at Cataggaman Area	L=1,400m	Erosion and Scouring Control

**Table R 5.2 Summary of Project Cost Proposed for
Cagayan River Basin as a Sub-Project under the Sector Loan Project**

Major Items	Cost Items	Estimated Costs (Million Pesos)	Remarks
Cost Applicable for Loan	Construction Base	1,871	Construction Term: 2012-2015
	D/D & S/V	299	
	Contingencies	528	
Sub-Total (1)		2,698	
Cost Inapplicable for Loan	Compensation	20	Houses and Lots
	Administration	95	DPWH and LGUs
	Contingencies	26	
	VAT & Tax	324	
Sub-Total (2)		465	
Total		3,163	
O&M		5.31	
EIRR		18.64%	

The economic evaluation mentioned above shows the project's implementation viability in terms of the NEDA requirement.

(2) Concerns in Project Implementation

The concerns in project implementation are as follows:

(a) Natural and Social Environmental Impact Evaluation

The erosion mitigation structural measure (revetment) proposed in this Study would require the relocation of several families, and DENR had recommended the preparation of a relocation action plan (RAP) even though the number of resettlement is quite small.

(b) Erosion and Scouring Issues in Progress

Erosion and scouring by floodwater has been going on at the proposed three (3) critical erosion sites even during the study period. However, it may take two (2) years before the project is commenced assuming that the L/A is concluded, and during these two years the erosion and scouring is expected to further aggravate. In this connection, the related agencies, DPWH and LGUs, are required to monitor the progress of erosion and scouring activities.

5.2.3 Proposed Non-Structural Measures

Based on the measures proposed in the 2002 F/S and the current status and activities in the Cagayan River Basin, the following community-based non-structural measures are proposed in parallel with the structural measures:

- Identification of Necessary Preparedness Plan and FEWS;
- Establishment of Hazard Map and Preparedness Plan; and
- Revision/Modification of Land Use/Development Plan.

In connection with the execution of the proposed measures mentioned above, proposed is a Technical Assistance Activity to support and enhance the capacity of related agencies, such as DPWH, OCD, PAGASA and LGUs concerned, in parallel with and as one sphere of implementation of the Sector Loan.

5.2.4 Climate Change Adaptation

Flood discharge would increase by 10 to 20% in 2050 and by 14 to 29% in 2100 due to climate change.

In this connection, the following non-structural measures shall be applied to climate change adaptation:

- Enlightenment Activities to Stakeholders regarding the Impact of Climate Change
- Strengthening of Flood Forecasting and Warning System

5.2.5 Possibility of Inclusion as Sub-Project in First Batch

Through the feasibility study, it has been identified that the sub-project of Cagayan River Basin is technically feasible, financially affordable, economically viable and environmentally acceptable. Thus, it can be said that the sub-project in Cagayan River Basin is qualified to be included in the first batch of the sector loan.

5.3 Ilog-Hilabangan River

5.3.1 Targeted Areas (Core Areas)

The core area refers to Kabankalan City, one of the key cities contributing to the economic development of the Province of Negros Occidental (together with the capital city of Bacolod), and the Municipality of Ilog, the first Spanish settler's land in Negros Island.

5.3.2 Proposed Structural Flood Mitigation Plan

(1) Summary of Structural Scheme to be Implemented with Sector Loan

Flood control works against a 25-year return period flood is proposed for completion in the first phase. The basic structural measures applied are the construction of dike and dredging.

The main features and estimated costs are shown in the attached **Figure 5.2** and summarized in the Table below.

Table R 5.3 Summary of Sector Loan Project Components Proposed for Ilog-Hilabangan River Basin

Contents of Project	Quantity	Purpose of Project
Construction of Dike along Kabankalan City Proper Area	L=6,100m	To protect the area against a 25-year return period flood
	L=1,000m	To protect the area against a 25-year return period flood
Construction of Dike along Sugarcane Mill Area	L=2,750m	To protect the area against a 25-year return period flood
Dredging Work in Lower Stretch	V=1.7 million m ³	To mitigate the impact of dike construction

Table R 5.4 Summary of Sector Loan Project Cost Estimated for Ilog-Hilabangan River Basin

Major Item	Cost Item	Estimated Cost (Million Pesos)	Remarks
Cost Applicable for Loan	Construction Base	1,611	Construction Term: 2012-2014
	D/D & S/V	258	
	Contingencies	475	
Sub-Total (1)		2,344	
Cost Not Applicable for Loan	Compensation	16	Houses and Lots
	Administration	81	DPWH and LGUs
	Contingencies	22	
	VAT & Tax	281	
Sub-Total (2)		400	
Total		2,744	
O&M		5.69	
EIRR		15.65%	

The economic evaluation mentioned above shows the project's implementation viability in terms of the NEDA requirement.

(2) Concerns in Project Implementation

The concerns in project implementation are as follows:

(a) Natural and Social Environmental Impact Evaluation

The dike construction along the Kabankalan Core Area would require the house relocation of more than 50 families. To achieve such a large-scale resettlement activity, DENR had required the preparation of a relocation action plan (RAP). In addition, the project with such large-scale resettlement activity may require a full EIA study in accordance with the JICA Guideline for Environmental and Social Consideration (2004).

(b) Consideration for Ilog Municipality

During the initial stage of the Study, the proposed plan included a ring dike encompassing the built-up area of Ilog Municipality. However, the construction of ring dike for the Municipality of Ilog was not acceptable because the ring dike would generate the difference between "protected" and "unprotected" areas in one community.

In this connection, the structural measure will contribute a slight shortening of flood inundation time to Ilog residents due to the dredging work in the lower channel. Hence, further careful consideration shall be taken for the residents of Ilog through the provision of non-structural measures.

(c) Disposal Site for Surplus Soil

In the project, approximately 1 million m³ of surplus soil derived from the excavation and dredging works have to be disposed. According to Kabankalan City as well as the Municipality of Ilog, these surplus soils are welcome to develop a vacant space for urbanization. In this connection, the timing of the expected land

development with the project's implementation shall be based on the project's implementation program.

5.3.3 Proposed Non-Structural Measures

Based on the current status and activities in the Ilog-Hilabangan River Basin, the following community-based non-structural measures are proposed in parallel with the structural measures:

- Establishment of Flood Early Warning System utilizing the Basin Flood Forecasting System.
- Preparation of Flood Hazard Map with the participation of residents, including dry run and map exercises in flood vulnerable areas.

In connection with the execution of the proposed measures mentioned above, proposed is the Technical Assistance Activity to support and enhance the capacity of related agencies, such as DPWH, OCD and PAGASA, in parallel with and as one sphere of implementation of the Sector Loan.

In addition, it is essential for basin-wide flood mitigation effect to undertake full-scale river improvement works in accordance with the 1991 M/P. To achieve such a full-scale river improvement works, LGUs shall first of all secure the proper river course to implement the widening of river channel. Therefore, the CLUP (comprehensive land use plan) shall delineate the designed dike alignment in the future land use map as the river area.

5.3.4 Climate Change Adaptation

The flood control framework proposed in the 1991 M/P did not consider the adverse effects of climate change. Basically, the raising of the proposed flood control dike was conceived. However, the raising of dike increases the flood damage potential in case of breach of dike. As for the sugarcane field, which expands on the left bank (opposite side of the city proper of Kabankalan), it shall remain for the time being without any development. Therefore, the construction of a retarding basin in which the peak discharge of Ilog-Hilabangan River can decline with the release of excess water into the basin is proposed for climate change adaptation.

In addition to the structural measures explained above, the following non-structural measures shall be applied to climate change adaptation.

- Enlightenment Activities to Stakeholders on the Impact of Climate Change
- Strengthening of Flood Forecasting and Warning System

5.3.5 Possibility of Inclusion as Sub-Projects in the First Batch

Through the feasibility study, it has been identified that the sub-project of Ilog-Hilabangan River Basin is technically feasible, financially affordable and economically viable. However, from the environmental point of view, the sub-project needs a relatively large number of house relocation, which can be classified into "Category A" under the JICA Guideline for Environmental and Social Consideration of (2004) and requires a full EIA study. Consequently, it may take a long time to conduct the full EIA study for this sub-project, which will affect the implementation schedule for the sub-projects in the other river basins covered by the sector loan. Through the series of discussions with DPWH, NEDA and JICA, it was concluded that the sub-project in Ilog-Hilabangan River Basin should not be included in the sector loan, so that proper arrangements should be taken to look for other financing sources for its implementation.

5.4 Tagoloan River Basin

5.4.1 Targeted Area (Core Area)

The core area refers to the Municipality of Tagoloan, which is one of the key industrial and built-up areas contributing to the economic development of the Province of Misamis Oriental. In fact, the targeted areas are located in the Misamis Oriental Industrial Belt Zone which were developed or to be developed by PHIVIDEDEC.

5.4.2 Proposed Structural Flood Mitigation Plan

(1) Summary of Structural Scheme to be Implemented under the Sector Loan

The M/P of Tagoloan River Basin was formulated 1982 (1982 M/P) under the former OECF (now, the New JICA). Based on the 1982 M/P, the first phase plan proposed against a 25-year return period flood has been adopted for the Sector Loan Project in this Study.

Due to industrialization and urbanization in the Municipality of Tagoloan, the DPWH constructed concrete-surfaced flood protection dikes on both sides of the Tagoloan River during the period 1994-2002. However, the dike system was stopped halfway due to financial constraint, although the main objective of dike construction was not only to prevent inundation but also to protect the adjoining land from scouring and bank erosion.

Therefore, the main flood mitigation work in the Sector Loan Project is to complete and improve the discontinued dike system to minimize the vulnerability to flood damage. With the completed structural flood protection system, it is expected that the core area will be further urbanized and industrialized.

Based on the result of the flood simulation analysis, the extension of dike on the right bank to the downstream will mitigate flood damage in the expected industrial zone in the near future, so that the extension is proposed together with the construction of dike on the right bank to prevent floodwaters from intruding to the built-up area in the upstream stretch.

In addition, dredging and excavation works in the towhead area located in the river course are proposed to sustain the design flood water level below the existing flood protection dike and the bottom of girder of the Tagoloan Bridge with sufficient freeboard.

The main features and estimated costs of the Tagoloan River Improvement Works are shown in the attached **Figure 5.3** and summarized in the Table below.

Table R 5.5 Summary of Sector Loan Project Components Proposed for the Tagoloan River Improvement Works

Contents of Project	Quantity	Purpose of Project
Extension of Dike along Right Bank at Downstream Section	L=2,000m	To protect area against 25-year return period flood
Construction of Dike along Right Bank at Upstream Section	L= 650m	To protect area against 25-year return period flood
Dredging Work in Towhead Area	A=8.8 has	To sustain water level below existing dike system

**Table R 5.6 Summary of Sector Loan Project Cost Proposed
for the Tagoloan River Improvement Works**

Major Items	Cost Items	Estimated Cost (Million Pesos)	Remarks
Cost Applicable for Loan	Construction Base	439	Construction Term: 2012-2014
	D/D & S/V	70	
	Contingencies	129	
Sub-Total (1)		638	
Cost Not Applicable for Loan	Compensation	31	Houses and Lots
	Administration	24	DPWH and LGUs
	Contingencies	11	
	VAT & Tax	77	
Sub-Total (2)		143	
Total		781	
O&M		2.60	
EIRR		19.48%	

The economic evaluation mentioned above shows the project's implementation viability in terms of the NEDA requirement.

(2) Concerns in Project Implementation

The concerns in project implementation are as follows:

(a) Natural and Social Environmental Impact Evaluation

Most of the houses located in the project site have already been relocated by PHIVIDEC. Therefore, the flood mitigation structural measure (dike and excavation) proposed in the Study will require the house relocation of only a few families.

However, DENR had recommended the preparation of a relocation action plan (RAP) even though the number of resettlement is quite small. In view thereof, the RAP has to be formulated and implemented.

(b) Land Acquisition

The alignment of the proposed flood prevention dike was shifted to the land side to secure the river flow area for smooth flow and sustain the design floodwater level below the existing dike crown with sufficient freeboard. This difference between the PHIVIDEC presumed area and the area proposed by the Study accounts for 20 hectares. Originally, this area was designated as government land. Therefore, the ownership of the land shall be dealt with prior to project implementation, including the MOA.

(c) Low-lying Area on Left Bank of Estuary

The low-lying area extending across the estuary on the left bank will be maintained as it is from the following reasons:

- Floodwater does not expand widely even without the construction of dike in the low-lying area.

- Low-lying area is located in flood risk area where floodwaters have overflowed in every flood.
- Since mangrove coasts have expanded in this low-lying area, it is desirable to preserve this area without modification.

Under the circumstances mentioned above, the low-lying area shall be preserved by the Tagoloan Municipality in association with PHIVIDEDEC.

5.4.3 Proposed Non-Structural Measures

Similarly as the results of the F/S for Cagayan and Ilog-Hilabangan River, the following community-based non-structural measures are proposed in parallel with the structural measures:

- establishment of Flood Early Warning System utilizing the Basin Flood Forecasting System.
- Preparation of Flood Hazard Map with the participation of residents, including dry run and map exercises in flood vulnerable areas.

In addition, it is essential to maintain a proper river area in the estuary area including the upstream stretches and the coastal area for future widening/excavation of river channel, extension of the flood dike and control of rising of tidal level, respectively. To achieve such a full-scale river improvement work, the LGUs shall first of all secure the proper river course to implement the widening of river channel. In this connection, the CLUP (comprehensive land use plan) shall delineate the river area with the designed dike alignment and low-lying area located in the estuary and shoreline in the future land use map as the river or control areas.

5.4.4 Climate Change Adaptation

The following non-structural measures shall be applied to climate change adaptation:

- Land Use Control and Designation of Flood Risk Area mainstreaming Disaster Risk Management
- Enlightenment Activities to Stakeholders on the Impact of Climate Change
- Strengthening of Flood Forecasting and Warning System

5.4.5 Possibility of Inclusion in Sub-Projects in First Batch

Through the feasibility study, it was identified that the sub-project of Tagoloan River Basin is technically feasible, financially affordable, economically viable and environmentally acceptable. Thus, the sub-project in Tagoloan River Basin is qualified for inclusion in the first batch of this sector loan.

5.5 Implementation Plan of the Project under Sector Loan

It is proposed that the construction work at the two (2) locations described above will be implemented as the First Batch in the Sector Loan Project. The estimated construction term is three (3) years during 2014-2016, as shown in the Figure below.

6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 Framework of Sector Loan

The Philippines is one of the countries most severely damaged by natural disasters in the East-Asia Region. Among the natural disasters, those caused by typhoons occupy most of the portion reaching 92.5% of the total damage. To cope with this situation, the Philippine Government has been making efforts, as emphasized seriously in the Medium-Term Philippine Development Plans.

However, several issues were pointed out in previous projects undertaken through the individual loan approach, which has not always successfully achieved the project targets regarding flood disasters. In due consideration of the issues by previous approaches, a new approach to mitigate such issues has been examined in the form of Sector Loan in this Preliminary Study.

In the new approach, three (3) tools are proposed to be introduced for the mitigation of previous issues. These tools consisting of (1) the introduction of sector loan with cooperative agreement, (2) the introduction of DRF (Disaster Rehabilitation Fund), and (3) the arrangement of technical assistance programs (T/A) have been carefully examined in the Preparatory Study, and it was concluded that the new approach is essential for the mitigation of previous issues and the tools are effective to achieve the targets.

6.1.2 Arrangement of Sub-Projects including F/S of the Three Selected Basins

In parallel with the study on the framework of the new sector loan approach, the arrangement of sub-projects has also been conducted in this study as to the manner of preparation of candidate river basins for flood control (arrangement of the long and short lists and selection of the objective river basins for feasibility study). Hence, the following three (3) objective river basins were selected for the examination of feasibility of flood control projects targeting protection of the core areas in the Cagayan River Basin (Tuguegarao and Enrile), Ilog-Hilabangan River Basin (Kabankalan and Ilog), and Tagoloan River Basin (Tagoloan). The Study has concluded that the long and short lists of flood control projects are adequate and the flood control projects for Cagayan and Tagoloan river basins are, in principle, technically feasible, economically viable and acceptable from the environmental point of view.

However, the flood control project in the Ilog-Hilabangan River Basin, which would require house relocation of more than 50 families, needs a full EIA to meet the JICA Guideline for Environment and Social Consideration. If the sub-project of Ilog-Hilabangan River Basin is included in the first batch under the Sector Loan, the implementation of sub-projects in the other river basins will be seriously affected because it will take some time for the realization of a full EIA.

Therefore, through the series of discussions with the stakeholders, it was concluded that only two (2) river basins (Cagayan and Tagoloan) are to be included in the first batch. Since the flood control project proposed for the Ilog-Hilabangan River Basin was excluded from the first batch, other financing sources for its implementation should be considered seriously by the authorities concerned.

6.2 Recommendations

6.2.1 Framework of Sector Loan

1. In this study, the framework of the sector loan has been examined putting more emphasis on the tools used for the improvement of issues pointed out under the previous individual loan approaches as mentioned above. In the course of the study, DPWH had considered setting-up an organization to manage the sector loan as well as ICD, which will handle the part of the soft for operation of the sector loan. In this context, it is recommended that such an organization should be set up as early as possible.
2. It is recommended that the above organization should initiate the arrangement for the application of sector loan such as approval of ICC, preparation of necessary documents for the EIA certificate, and preparation of documents for the loan agreement (L/A) in accordance with the expected schedule.
3. In this study, the items for cooperative agreement together with the timing of the realization have been proposed as part of the tools. In this connection, the items of the cooperative agreement should be finalized through discussions among the related agencies such as DPWH and JICA before appraisal mission in principle, and then the agencies concerned should realize the items by the timing required.
4. For the introduction of DRF as one of the tools, it is proposed to improve the current management system by BOM on the QRF (quick response fund) and the GAA (General Appropriations Act) with regard to their utilization in restoration works for damaged river structures with the involvement of other offices of DPWH (PS and FCSEC). It is recommended to prepare the manual and guideline for management of the DRF as well as QRF and GAA, based on the system proposed in this study and it is also proposed to set-up the strategy for continuation of the DRF by the Philippine Government as early as possible.
5. To assist in project implementation under the new approach, it is also proposed to introduce the technical assistance program (T/A) consisting of the five (5) items mentioned before. For the smooth implementation of sub-projects, the introduction of T/A seems to be indispensable and the action to request for T/S should be initiated as early as possible, especially for the items which require early introduction such as the setup of mechanism to manage the DRF and the application of non-structural measures.

6.2.2 Arrangement of Sub-Projects including F/S of the Three Selected Basins

1. In this study, the preparation of the long and short lists and the selection of objective river basins for F/S were conducted in the course of arrangement of sub-projects. It is expected that the sub-projects implemented with sector loan for the two (2) river basins (Cagayan and Tagoloan) are included in the first batch. In this connection, finalization of the objective river basins to be included in the first batch is recommended to accelerate the necessary procedures for loan application.
2. For these two river basins, there are still some requirements remaining for the loan application, especially the ICC approval including the RDC resolution, receipt of ECC, arrangement of MOA and so on. In this connection, it is recommended to seriously take prompt actions to satisfy all of the requirements.
3. Among the above remaining requirements, the receipt of ECC is one of the significant processes to promote the sector loan project, since the sub-projects could not be undertaken without the ECC. In this study, only the materials for IEE have been arranged and additional

study, which has to be undertaken by the proponent agencies, will be required. Therefore, it is strongly recommended to seriously take prompt actions toward the receipt of ECC.

4. As for the sub-project in the Ilog-Hilabangan River Basin, it has been excluded from the first batch in this sector loan since it would require a full EIA study in accordance with the JICA Guideline for Environmental and Social Consideration (2004) due to the relatively large number of house relocation of more than 50 families and it would take some time to complete the full EIA study. Consequently, if the sub-project in the Ilog-Hilabangan River Basin is included in the first batch, the implementation of sub-projects for the other river basins by the sector loan will be seriously affected. However, it is recommended that the flood control project for the Ilog-Hilabangan River Basin should be considered seriously and thorough arrangements with other financing sources should be made since the project is urgent and it has been identified in the F/S that it is technically, economically and financially viable.

TABLES

Table 3.1 Cooperative Agreement for Sector Loan on Disaster Risk Management

Target	Major Actions	Expected Schedule for Application of Loan and Realization of Major Actions					
		Preparation for Application of Loan	Preparation for ICC for Second Batch	Preparation for ICC for Third Batch	D/D and Implementation for Second Batch / D/D and Implementation for Third Batch		
Direction to Improvement through introduction of Cooperative Agreement	Strengthening of DPWH Capacity (PS, FCSECC and Local Offices)	1. ICD Set up (Clarification of Secretary, Member, role and budget) 2. Formulation of PDM for T/A (incl. Request of Introduction of Expert) 3. Issuance of Department Order for Permanency of ICD 4. Formulation of DPWH Strategy Action Plan for Strengthening of Capacity for Flood Management including Time Schedule 5. Proposal on Permanency of FCSECC (Request to DBM) 6. Realization of DPWH Strategy and Continuation of Capacity Development 7. Confirmation of Activity for Realization of DPWH Strategy *1 7.1 Preparation of Manual on Climate Change for Flood Control 7.2 Revision of Typical Drawings of River Structures 7.3 Revision of Action Plan 8. Formulation of Flood Control Project and Implementation by DPWH for the other river basin excluding sector loan sub projects. 1. Clarification of Responsible Persons with the role/responsibility and assurance of budget and staff in Local Office for Flood Control (Regional Offices and DEO) 2. Formulation of Strategy Action Plan for Strengthening of Capacity for Flood and River Management including Time Schedule 3. Realization of strategy 4. Confirmation of Activity for Realization of strategy 4.1 Establishment of River Section in each Regional Office and DEO 4.2.1 Preparation of Database for Flood Control Structures by Each DEO (More than 50% of DEO will have prepared Database.) 4.2.2 Preparation of Database for Flood Control Structures by Each DEO (All DEOs (100%) will have prepared Database.)	Commencement of the Consultant Service Selection of Consultants Loan Agreement ICC-CC approval and ICC-Board approval Appraisal Mission ICC-TB approval Submittal of ICC document to NEDA Preparation of Umbrella ICC document	JICA concurrence for D/D Completion of D/D for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Second Batch	Completion of Construction for Third Batch Completion of Construction for Second Batch Completion of Construction for First Batch Commencement of Construction for Third Batch Commencement of Construction for Second Batch Completion of D/D for Third Batch JICA concurrence for D/D Completion of D/D for Second Batch Commencement of Construction for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Third Batch		
			Enough Capacity of Integrated Flood Management	1. ICD Set up 2. Drawing the Concept of Utilization of DRF, QRF and GAA, Formulation of PDM for T/A (incl. Request of Introduction of Expert) 3. Approval of DRF Mechanism by NEDA (Approval of Sector Loan incl. DRF) 4. Confirmation of Availability of Special Account 5. Clarification of Strategy for continuation of DRF and Legal Arrangement 6. Issuance of Draft IRR for DRF Operation 7. Operation, Monitoring, Review, Evaluation and Modification of Mechanism of DRF 8. Confirmation of Action for continuation of DRF in accordance with the Concept, the Operation Rule and the Strategy 8.1 Issuance of Revised IRR for Operation of DRF 8.2 Utilization of Database for Application for DRF 8.3 Securement of Budget for DRF for Continuation 9. Continuation of DRF as well as QRF and GAA	Commencement of the Consultant Service Selection of Consultants Loan Agreement ICC-CC approval and ICC-Board approval Appraisal Mission ICC-TB approval Submittal of ICC document to NEDA Preparation of Umbrella ICC document	JICA concurrence for D/D Completion of D/D for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Second Batch	Completion of Construction for Third Batch Completion of Construction for Second Batch Completion of Construction for First Batch Commencement of Construction for Third Batch Commencement of Construction for Second Batch Completion of D/D for Third Batch JICA concurrence for D/D Completion of D/D for Second Batch Commencement of Construction for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Third Batch
					1. Clarification of Responsible Persons in DPWH 2. Preparation of Strategy for supporting system to LGUs and Formulation of PDM for T/A (incl. Request of Introduction of Expert) 3. Preparation of Manual and Guideline for introduction of Non-structural Measures 4. Set-up Flood management committee including DPWH, LGUs and other agencies for First Batch, Second Batch and Third Batches 5. Realization of supporting for LGUs for Sub-project of each Batch 6. Setup and Commencement of Operation of Non-structural Measures for River Basins in each batch 7. Monitoring, Review, Evaluation, Modification of Operation, Manual and guideline as well as strategy 8. Revision and Improvement of Manual on Non-structural Measures 9. Application of Supporting system for other River Basins and continuation	Commencement of the Consultant Service Selection of Consultants Loan Agreement ICC-CC approval and ICC-Board approval Appraisal Mission ICC-TB approval Submittal of ICC document to NEDA Preparation of Umbrella ICC document	JICA concurrence for D/D Completion of D/D for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Second Batch
River Basin Governance including Establishment of Project Process (Participatory Planning and Resettlement Planning, ICP, River Basin Forum, involving LGUs and communities in whole project cycle) Coordination with LGUs and other Organizations in a manner of MOA for O&M, River Basin Management, Environment Improvement	1. Set-up ICD 2. Formulation of PDM for T/A (incl. Request of Introduction of Expert) 3. Guideline for Establishment of Project Process including River Basin Governance (Participatory Planning and Resettlement Planning, ICP, River Basin Forum involving LGUs and Communities in whole Project Cycle) 3.1 Preparation of Guideline 3.2 Issuance of D.O. for Guideline for establishment of Project Process 4. Sample MOA for O&M, River Basin Management and Environmental Improvement (Issuance of Department Order) 4.1 Preparation of Sample MOA 4.2 Issuance of Department Order of Sample MOA 4.3 Issuance of Revised Department Order of Guideline and Sample MOA 5. Holding of Seminar on River Administration in the Philippines 6. Application and Utilization of Guideline and MOA for sub-projects of each Batch by sector loan and for other projects 7. Set-up of Flood Management Committee for implementation of sub-projects for First Batch, Second Batch and Third Batches 8. Finalization of MOA for Sub-projects for First Batch, Second Batch and Third Batches 9. Operation/Monitoring (Review/Evaluation) of Guideline and Sample MOA 10. Proposed Draft of New River Act or Revision of Water Act to Congress and Senate	Commencement of the Consultant Service Selection of Consultants Loan Agreement ICC-CC approval and ICC-Board approval Appraisal Mission ICC-TB approval Submittal of ICC document to NEDA Preparation of Umbrella ICC document	JICA concurrence for D/D Completion of D/D for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Second Batch	Completion of Construction for Third Batch Completion of Construction for Second Batch Completion of Construction for First Batch Commencement of Construction for Third Batch Commencement of Construction for Second Batch Completion of D/D for Third Batch JICA concurrence for D/D Completion of D/D for Second Batch Commencement of Construction for First Batch ICC-CC approval and ICC-Board approval ICC-TB approval Submittal of ICC document to NEDA Preparation of ICC document Selection of objective River Basin for Third Batch			

Note :
 ◎: Timing for realization of cooperative agreement.
 ○: Procedural Cooperative Agreement to commence First Batch
 ⊙: Procedural Cooperative Agreement to commence Second Batch
 ⊚: Procedural Cooperative Agreement to commence Third Batch
 *1: These items are subject to Action Plan to be prepared by DPWH. Items in the table above are tentatively prepared based on proposed contents of T/As (See Tables 3.4 to 3.8.)

Table 3.2 Cooperative Agreements and Confirmatory Period

Keyword	ICC Preparation ~ by L/A	at the Commencement of ...				
		D/D of Second Batch	Construction of First Batch	D/D of Third Batch	Construction of Second Batch	Construction of Third Batch
ICD	Set-up					
T/As	Issuance of D.O.					
Action Plan	Preparation of PDMs					
Assignment	Pareparation for Capacity Development of DPWH Clarification of Responsible Persons in charge of Non-Structural Measures in DPWH Head Office Clarification of Responsible Persons for Flood Control in DPWH Local Offices		Revision of Action Plan			
Organization	Proposal on Permanency of FCSEC		Establishment of River Section in each Local Office			
DRF	Mechanism					
	Special Account Strategy for continuation Issuance of Draft IRR				Securement of Budget for Continuation	
Flood Management Committee	Set-up for River Basins in First Batch					
Guideline	Set-up for River Basins in Second Batch					
	Preparation for Establishment of Project Process Issuance of Department Order Preparation of Sample Issuance of Department Order					
MOA	Finalization of MOA for Sub-projects in First Batch					
	Finalization of MOA for Sub-projects in Second Batch					
Manual	Preparation on Climate Change for Flood Control					
	Preparation on Non-structural Measures					
Drawing	Revision of Typical Drawings of River Structures					
	Holding of Seminar on River Administration in the Philippines					
Database	Proposed Draft of New River Act or Revision of Water Act					
						More than 50% of DEOs (100%)

Table 3.3 Concept of Disaster Response Fund

Item	National Calamity Fund (NCF)	Quick Response Fund (QRF)	Emergency Response Fund (ERF)
Amount	<p>CY2008: 4,283,956,230</p> <p>CY2007: 933,330,764</p> <p>CY2006: 1,173,834,752</p> <p>CY2005: 700,000,000</p> <p>CY2004: 700,000,000 (Source:OCD)</p>	<p>QRF: 25% of Total NCF at Budget Alloc. Actual Allocation</p> <p>2008:16%, 2007:40%, 2006:29%</p> <p>DPWH: 20% of Total QRF at Budget Alloc.</p> <p>5% of Total NCF at Budget Alloc.</p>	<p>Approx. US\$ 20million</p> <p>(as conceivable idea: finalized subject to clear vision in the Study)</p>
First Criteria	<p>For urgent and emergency relief operations, health services, settlement and rehabilitation of the affected populations, as well as the emergency repair and rehabilitation of vital public infrastructures and lifelines damaged by calamities occurring within the budget year, such as hospitals and health facilities, schools, major roads and bridges, and farm-to-market, among others.</p>	<p>those involving immediate rehabilitation of collapsed bridges, cut road sections, breached seawalls and dikes and unroofed or totally destroyed public buildings to quickly restore mobility and ensure the safety of the affected areas.</p>	<p>Seriously, heavily damaged following structures constructed by DPWH, natural hazards, and critical natural conditions causing floodings but not supported by neither NCF nor QRF:</p> <ol style="list-style-type: none"> 1. Flood Control Structures; RECONSTRUCTION Dike, Revetments, Sabo Dam, Floodway and the appurtenants regarding flood control 2. Heavily and Huge Sedimentation (more than 1.0m deposit); DREDGING
Second Criteria	<p>For repair, rehabilitation and reconstruction of other damaged public infrastructures/facilities which are not emergency in nature but are necessary for disaster mitigation.</p>	<p>those involving ordinary repair works such as patching, resurfacing or washed-out roads and repair of heavily damaged but usable public building and slightly destroyed flood control projects.</p>	<p>Slightly damaged following structures constructed by DPWH, natural hazards, and critical natural conditions causing floodings:</p> <ol style="list-style-type: none"> 1. Flood Control Structures; REPAIR or MAINTENANCE the Same as "First Priority" 2. Huge Sedimentation (more than 0.5m deposit); DREDGING 3. Damaged Bottle-Neck Portion; WIDENING & RECONSTRUCTION (incl. Bridge) (less than 50% of average flow area at upper or lower sections) *1
Third Criteria	<p>For pre-disaster activities outside the regular budgets of line agencies and proposed capital expenditures for pre-disaster operations.</p>	<p>those involving minor repair work and/or improvement to prevent further deterioration such as repair of road section and slightly damaged</p>	<p>None</p>

Note : *1: Design and improvement measures shall be evaluated and directed to Ros/DEO by ICB. (Refer to Flood Risk Mangement System.)

Table 3.4 Work Breakdown Structure for T/A(Strengthening of DPWH Capacity)

Type of Cooperation		Technical Assistance Project		Assumed Implementation Year					
Name of Cooperation		1. Strengthening of DPWH Capacity							
Outcome / Output		Activities		Input					
0. Implementation Structure of Project		0.1 ICD Team is organized for Capacity Development on DRM *		Expert A: River Engineering: 3.0M/M for Establishment of Organization	2010–				
		0.2 Functions/responsibilities of FCSEC-DPWH are maintained. Permanency of FCSEC is proposed and Requested. *							
		0.3 P/S and FCSEC-DPWH actively take initiatives on Flood Control and DRM.							
		0.4 Action Plans for T/A and Strengthening of DPWH Capacity are prepared. *							
		0.5 Responsible Person(s) and budget in charge of Flood Control are allocated in each Regional Office and DEO. *							
		0.6 Sector Loan Project on Disaster Risk Management is commenced							
		1.1.1 Provision of concrete examples in Manuals. (e.g. Planning Sample of major rivers, principal rivers, and drainage channels).							
		1.1.2 Provision of New Chapter on Planning of Core Area Protection and Concrete Examples							
		1.1.3 Preparation/Holding of Seminar/Workshop for Personnel of ROs and DEOs							
		1.2.1 Provision of New Chapter on Climate Change Adaptation in the Manual of River Planning and Design							
		1.2.2 Provision of Manual of Countermeasures for Sea Level Rising In/Around Shorelines and Coastal Zones. (To supplement the present Manual)							
		1.2.3 Preparation/Holding of Seminar/Workshop for personnel of ROs and DEOs							
		1.3.1 Preparation of Manual of Economic Analysis for Flood Protection/River Improvement Works							
		1.3.2 Preparation/Holding of Seminar/Workshop for Personnel of DPWH in each Regional Office and DEO is established. **D							
1. Staffs of P/S and FCSEC-DPWH can improve their capacity to formulate M/Ps and conduct F/S on flood control and disaster risk management, as well as coach/supervise the staffs of LGUs and other agencies concerned on the formulation and conduct of M/Ps and F/S on flood control.		2.1.1 In coordination with DPWH bureaus concerned, Typical and Standard Drawings are enhanced.		Expert A: River Structures 12.0M/M: Drawings & Reference 12.0M/M: Revision of Manual, Seminar and W/S	2011–2013				
		2.1.2 River structures to be added in the Drawings are analyzed and their standard structural drawings are provided in the Drawings.							
		2.1.3 River Structural Drawings are approved by DPWH.							
		2.1.4 Preparation/Holding of Seminar/Workshop for Personnel of DPWH							
		2.2.1 River structural drawings are collected from PMO, ROs and DEOs.							
		2.2.2 Cases of failure/success on river structure designs are collected.							
		2.2.3 The causes of failures are analyzed and elaborated.							
		2.2.4 Aforementioned Analysis and Study are summarized and Reference Books/Drawings are prepared.							
		2.2.5 Revised Manuals/Regulations for reference are prepared.							
		2.2.6 Preparation/Holding of Seminar/Workshop for Personnel of DPWH							
		3.1.1 Confirmation/recognition of existing hydrological data collection system							
		3.1.2 Proposition and assurance of new hydrological collecting system.							
		3.2.1 Enlightenment activities on meaning of Hydrological Data to personnel concerned							
		3.2.2 Approach on Methods of generating funds for Hydrological Data Collection System							
2. The key personnel of DPWH will further absorb knowledge and technology on River Improvement and Flood Control techniques to efficiently supervise personnel of ROs/DEOs/LGUs in river planning and design.		2.1 Drawings of River Structures prepared by FCSEC-DPWH become considerably increased and standardized.		Expert A: Hydrology 6.0M/M	2013–2014				
		2.2 Lessons learned from good and bad examples accumulate and reference books for Drawings are prepared resulting in the further improvement of Manuals.							
		3.1 Collecting System for basic hydrological data is established.							
		3.2 DPWH staffs recognize the importance of hydrological data.							
		3. Basic Hydrological Data are collected nationwide to accumulate sufficient data for the Flood Control Plan.				Basic Conditions to assure national land development are established because the flood control planning and project implementing capability of DPWH is enhanced. <Counterparts: DPWH (P/S, FCSEC, BOD and BRS) and ICD Team with OCD and PAGASA>		Experts A & B: 54.0M/M in total	2010–2014
						Note : * : Cooperative Agreement for the Commencement of D/D for the First Batch (the Commencement of Sector Loan)			
						**D : Cooperative Agreement for the Commencement of D/D for the Second Batch.			

Table 3.5 Work Breakdown Structure for T/A(Setup of Mechanism of Utilization of Disaster Rehabilitation Fund (DRF))

Type of Cooperation	Technical Assistance Project		Assumed Implementation Year	
Name of Cooperation	Setup of Mechanism of Utilization of Disaster Rehabilitation Fund (DRF)			
	Outcome / Output	Activities	Input	
0. Implementation Structure of Project		0.1 Sector Loan Project on Disaster Risk Management is started. 0.2 Functions/responsibilities of FCSEC-DPWH are maintained. 0.3 P/S and FCSEC actively take initiatives on Flood Control and DRM 1.1.1 Reconfirmation of Operation Criteria for Targeted Structures/Calamities 1.1.2 Confirmation of Availability of Special Account * 1.1.3 Reconfirmation of Operation Rules and Systems 1.1.4 Determination of Definitive Operation Rules and Systems 1.1.5 Establishment of Manual of Operating System and Rules 1.2.1 Support on Setup of DRF Operation Team/Task Force 1.2.2 Study on revising/improving Manual of O&M Activities prepared by FCSEC-DPWH 1.2.3 Study on Evaluation System of depreciation, appraisal values and damaged amount estimation methods for river structures 1.2.4 Study on modification of River Structure Database System 1.2.5 Preparation/Holding of Explanation Seminar and W/S for Operation Team 2.1.1 Establishment of Explanation and Manual of Operation System of DRF 2.1.2 Support and Assistance Activities for Explanation of Operation System to Staffs of ROs DEOs 2.2.1 Support in Preparing River Structure Database for DEOs 2.2.2 Confirmation of Database submitted by DEOs **I (More than 50% of DEOs) ***I (100% of DEOs achieved) 2.2.3 Recording/Revising System for Database and Explanation to DEOs 3.1.1 Check and Verification of Damage Report 3.1.2 Utilization of Database for Application for DRF ***D 3.1.3 Support/Assistance in preparing Damage Report through OJT 3.2.1 Support/Assistance in Investigation/Evaluation/Rehabilitation Plan Activities 3.2.2 Support/Assistance in Cost Estimation for Rehabilitation Works 3.2.3 Record of Rehabilitation Works in coordination with Operation Team <i>Implementation works are undertaken in the Sector Loan Project.</i> 4.1.1 Review of Design Guidelines and Procedures on the Design of River Structures taking into consideration the causes of damage 4.1.2 Propounding Revision of Manual and Guidelines 4.2.1 Preparation of Reference Book for Drawings incl. actual damage practice 4.2.2 Propounding Revision of Drawings and Adding Remarks in the Drawings 4.2.3 Revision of Drawings and Adding Remarks in the Drawings **D 4.3.1 Preparation of Revised IRR for Operation of DRF **D 4.3.2 Securement of Budget for DRF for Continuation ***I	No Input (Basic Conditionality)	2010-
1. Operation System of DRF is established.	1.1 Operating Rules are established 1.2 Basic Conditions of operating rules/systems are formulated in DPWH. (Issuance of Draft IRR for DRF Operation)	Expert A: River Planning River Structure 12.0M/M	2010-2011	
2. Operation System of DRF is understood and recognized in DPWH	2.1 Operating System for DRF are conveyed from key staffs to staffs of DPWH 2.2 Necessary and required materials for the operation of DRF are prepared by each RO and DEO	Expert A: River Planning River Structures 6.0M/M x Batch	2011-2016	
3. The DRF System is operated and the Funds are sanely utilized for damaged river structures.	3.1 Databases are utilized for damaged reports. 3.2 Design and Plan of Rehabilitation/Retrofit works are properly prepared.	Expert A: River Planning River Structures 48.0M/M (Tentative)	2013-15	
4. Through the DRF operation activities, accumulated knowledge on river structures can be utilized in river designing and planning.	4.1 Manual of Design of River Structures is improved. 4.2 Drawings of Typical River Structures are enriched. 4.3 Operation of DRF is continued.	The same M/M as Item No. 3	2013-2015 2013 2015	
DPWH prepares the budget for rehabilitation and reconstruction of damaged river structures after completion of operation of DRF. <Counterparts: DPWH (P/S, FCSEC, BOM)>			Expert A: River Planning/Structure 66.0M/M (tentative)	2010-2016

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 ***D : Cooperative Agreement for the Commencement of D/D for the Third Batch.
 **I : Cooperative Agreement for the Commencement of Implementation of the Second Batch
 ***I : Cooperative Agreement for the Commencement of Implementation of the Third Batch

Table 3.6 Work Breakdown Structure for T/A (Assistance on Setup of Non-Structural Measures)

Type of Cooperation	Technical Assistance Project	Assumed Implementation Year
Name of Cooperation	3. Assistance on Setup of Non-Structural Measures	Input
Outcome / Output	Activities	
0. Implementation Structure of Project	0.1 River Basins to be protected in the Sector Loan Project are selected. 0.2 Conditionalities (C/A) of Project Implementation are confirmed. * 0.3 Sector Loan Project on Disaster Risk Management is started. 0.4 P/S and FCSEC actively take the initiative on Flood Control and DRM.	No Input (Basic Conditionality) (by Actual Project)
1. Manual on the Non-structural Measures are prepared for all river basins as general standard type.	1.1 Draft Manual on Non-Structural Measures including methods, role and manners for establishment are prepared. **D 1.2 As needed, the manual is revised.	Expert A: Flood Control 3.0M/M
2. Essential Non-Structural Programs for Selected River Basins are formulated.	2.1.1 Flood Management Committee is established in each Sub-project. * **D ***D 2.1.2 Features and Figures of Flooding Type/Runoff System are confirmed. 2.1.3 Program fitting-in with targeted river basin is established. 2.1.4 Importance of Non-Structural Measures is disseminated.	- Expert A: Flood Control 1.0M/M x Batch
3. Early Warning System is established and operated.	3.1.1 Locations of monitoring rainfall and water levels are fixed 3.1.2 Methods to evaluate/monitor rainfall/water levels are studied/determined. 3.2.1 Appropriate Alert/Warning/Evacuation systems are determined. 3.2.2 Action plans at water levels and rainfall amounts for warning are formulated. 3.2.3 Announcement and Dissemination to Targeted Residents.	Simple Water Gauge: 1LS Simple Rainfall Gauge: 1LS Expert A: Flood Control 2.0M/M x Batch
4. Flood Hazard Maps are prepared and Evacuation System are established.	4.1.1 Collection of Data and Basic Information 4.1.2 Preparation and Publication of Flood Hazard Map 4.2.1 Selection of Target Barangays 4.2.2 Checking of Evacuation Center 4.2.3 Preparation of Flood Hazard Map (Draft) 4.2.4 Preparation of Map Exercise 4.2.5 Map Exercise in Target Barangays 4.3.1 Field Reconnaissance 4.3.2 Preparation of Seminar and Drill 4.3.3 Seminar and Evacuation Drill in Target Barangays 4.3.4 Modification of Hazard Map 4.4.1 Preparation of Flood Prevention Manual 4.4.2 Trainer's Training on Flood Hazard Map	Expert A: Flood Control 1.5M/M x Batch
5. Mainstreaming DRM in urban planning is accelerated.	5.1.1 Implementation Support for Land Use Control and Confirmation of Flood Risk Area 5.1.2 Preparation of Revised CLUP including Land Use Control Policy 5.2.1 Confirmation of Warning System, Hazard Map and Evacuation System and Revision and Improvement of Manual ***D 5.2.2 Preparation of Draft Disaster Management Plan with policies/responsibilities 6.1.1 Training Program (Module) Development 6.1.2 Trainers' Training 6.2.1 Conduct of Community Workshop 6.2.2 Support on Tree Planting/Trash-Picking in communities	Expert A: Flood Control 1.5M/M x Batch
6. River beautification movements/activities are activated.		Expert A: Flood Control 2.0M/M x Batch
Flood damage and human suffering are alleviated due to activation of Non-Structural Mitigation Activities against flood. (Counterparts: FCSEC-DPWH, OCD, PAGASA and LGUs concerned)		Expert A: Flood Control 2.0M/M x Batch

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***[] : Cooperative Agreement for the Commencement of Implementation of the Third Batch

Table 3.7 Work Breakdown Structure for T/A (Advice on Legal System Arrangement for River Administration)

Type of Cooperation	Technical Assistance Project	Assumed Implementation Year
Name of Cooperation	4. Advice on Legal System Arrangement for River Administration	
Outcome / Output	Activities	Input
0. Implementation Structure of Project	<p>0.1 ICD Team is organized for Capacity Development on DRM *</p> <p>0.2 P/S and FCSEC-DPWH actively take initiatives on Flood Control and DRM</p> <p>0.3 Guideline for River Basin Governance and Flood Control Project is prepared. *</p> <p>0.4 Sample MOA for Flood Control Project and O&M is prepared and issued. *</p> <p>0.5 Sector Loan Project on Disaster Risk Management is commenced.</p> <p>1.1.1 Clarification of present organization and roles of agencies concerned in River Administration</p> <p>1.1.2 Clarification of Issues on Present System and Organization</p> <p>1.2.1 Study on Directionality for resolution of issues</p> <p>1.2.2 Hearings and Discussions with Agencies concerned</p> <p>1.2.3 Preparation/Holding of Seminar/Workshop with Agencies concerned **D</p> <p>2.1.1 Collection and Clarification of River Laws in different countries</p> <p>2.1.2 Clarification of Issues on Water Resources Management in terms of River Administration in the Philippines.</p> <p>2.1.3 Clarification of Issues on Legal System in the Philippines</p> <p>2.2.1 Propounding New Legal System for River Administration</p> <p>2.2.2 Discussion of New Legal System and the Multi-Agency Consensus-Building</p> <p>2.2.3 Preparation/Holding of Seminar/Workshop with Agencies concerned</p> <p>2.2.4 Proposed Draft of New River Act or Revision of Water Act ***D</p> <p>3.1.1 Advice/Supervision/Guidance on T/A: "Assistance on Setup of Non-Structural Measures"</p> <p>3.1.1 Advice/Supervision/Guidance on T/A: "Strengthening of DPWH Capacity"</p> <p>3.1.1 Advice/Supervision/Guidance on T/A: "Setup of Mechanism for Utilization of ERF"</p> <p>3.1.1 Advice/Supervision/Guidance on T/A: "Assistance onr Setup of Non-Structural Measures"</p> <p>3.2.1 Research on the Generation of Effect of Flood Control Project</p> <p>4.1.1 Collection and Clarification of Methods of Climate Change Adaptation in different countries</p> <p>4.1.2 Collection and Confirmation of Latest Researches on Climate Change in different countries</p> <p>4.1.3 Preparation/Holding of Seminar/Workshop for Related Engineers</p> <p>4.2.1 Collection and Analysis of Climate Change Phenomena in the Philippines</p> <p>4.2.2 Study on Climate Change Adaptation in the Philippines</p> <p>2.3.2 Preparation/Holding of Climate Change Adaptation Seminar/Workshop</p> <p>5.1 Enhancement of recognition of importance of DPWH through the Activities and Seminars mentioned above</p> <p>5.2 Sample MOA for more appropriate implementation of Flood Control Project is revised. ***D</p> <p>5.3 Enhancement of recognition of importance of Flood Control Works to agencies concerned through Seminars</p>	<p>Expert A: River Engineering: 3.0M/M for Establishment of Organization</p> <p>Expert A: For Long Term Expert, the activities or tasks in DPWH as mentioned in the left columns are mandated. (Term: 5-8 years)</p>
1. The necessity of an Integrated and Cooperative Structural System of River Administration is recognized.	<p>1.1 Issues on the Current System of River Administration are recognized.</p> <p>1.2 Directionality of ideal river administration is oriented and shared with stakeholders.</p>	2010-2011
2. The necessity of establishment of an ideal legal system of river administration is recognized.	<p>2.1 Issues on legal system of river administration are clarified.</p> <p>2.2 Legal System necessary for River Administration and the contents are clarified.</p>	2012-2013
3. Flood control and river planning capacity is enhanced with the strengthening of DPWH Capacity through Sector Loan	<p>3.1 Related Activities (T/As) in parallel with Sector Loan Project are supervised and directed.</p> <p>3.2 The Effectiveness of Flood Control Project is recognized.</p>	2010-2011
4. The necessity of earlier implementation of climate change adaptation is recognized in the Philippines.	<p>4.1 The latest information and countermeasures regarding climate change on global magnitude are clarified.</p> <p>4.2 The necessity of earlier implementation of climate change adaptation is recognized.</p>	2014-2015
5. The recognition of importance of implementing Flood Control projects is shared with stakeholders.	<p>5.1 Enhancement of recognition of importance of Flood Control Projects through Seminars mentioned above</p> <p>5.2 Sample MOA for more appropriate implementation of Flood Control Project is revised. ***D</p> <p>5.3 Enhancement of recognition of importance of Flood Control Works to agencies concerned through Seminars</p>	2014
	<p>Capacity for River Administration in the Philippines is developed <Counterparts: DPWH (P/S, FCSEC), DENR (RBCO/NWRB), OCD, NEDA></p>	2012-2018
	<p>Expert A: 5-8 years</p>	2010-2018

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Table 3.8 Work Breakdown Structure for T/A (Advice on Collection System Arrangement for O&M Budget and Capacity Development on Drainage Improvement)

Type of Cooperation	Technical Assistance Project		Assumed Implementation Year
Name of Cooperation	5. Advice on Collection System Arrangement for O&M Budget and Capacity Development on Drainage Improvement	Input	
Outcome / Output	Activities	(Basic Conditionality)	
0. Implementation Structure of Project	0.1 P/S and FCSEC-DPWH actively take initiatives on Flood Control and Disaster Risk Management.	No Input	2010-
	1.1 Current status of budget allocation and expenditures for flood control by LGUs are confirmed.	Expert A: Economist Legal Specialist 3.0M/M x Batch	2016-2018
	1.2 Benefit from the Flood Control relished by LGUs are evaluated.		
	1.3 New collection systems of budget for O&M activities are proposed.	Expert A: Economist Legal Specialist 3.0M/M x Batch	2016-2018
1. Collection Systems for New O&M Budget accommodating each LGU are proposed.	1.2.1 Confirmation and Research on the Benefit of Flood Control		
	1.2.2 Clarification of relation between total benefit of Flood Control projects and benefit of each LGU		
	1.3.1 Study on possible fund resources for LGUs after flood control projects		
	1.3.2 Discussion with targeted LGUs regarding fund resources for New Charges		
	1.3.3 Discussion on fund resources for New Charges by LGUs with Jurisprudence.		
	1.3.3 Preparation of New Ordinance for new budget collection system		
	1.3.4 Preparation/Holding of Seminar/Workshop with Agencies concerned		
	2.1.1 Clarification of New Budget Resources considered, prepared and proposed by each LGU.		
2. Manual on the Creation of New Budget from Possible Resources for O&M Activities due to effects brought by Flood Control Projects or particular features borne by LGUs are established and disseminated.	2.1.2 Preparation of Manual on Obtaining Budget for O&M after Flood Control Project.	Expert A: Economist Legal Specialist 3.0M/M x Batch	2016-2018
	2.2.1 Preparation/Holding of Seminar/Workshop with national agencies concerned		
	2.2.2 Preparation/Holding of Seminar/Workshop with LGUs concerned		
3. Targeted LGUs conclude MOA for O&M, totally know the Manual and properly undertake O&M activities.	3.1 O&M Manual is totally known by LGUs.		
	3.2 Appropriate MOA between DPWH and LGUs is concluded for proper O&M.		
	3.3 Suitable O&M Activities are executed by LGUs.		
	4.1 LGUs recognize the importance of Flood Control	Expert B: River Maintenance River/Drainage Plan 2.0M/M x Batch	2017-2019
	4.2 LGUs master the manner of Drainage Improvement	Expert B: River Maintenance River/Drainage Plan 2.0M/M x Batch	2017-2019
Drainage Systems in the jurisdiction of targeted LGUs are improved and flood damage is decreased, since LGUs prepare the budget for O&M of river/drainage facilities to maintain the flood control function of facilities constructed. <Counterpart: DILG (LGUs) and FCSEC-DPWH>	3.1.1 Guide and Introduction of O&M Manual to LGUs 3.1.2 Support/Assistance in Preparing Database of River Structures 3.2.1 Study on Cost Estimation Methods of O&M and Frequency for Facilities 3.2.2 Study on Proper Work Demarcation of Budget, Frequency in terms of considered Priority/Order of Importance between DPWH and LGUs. 3.2.3 Support/Assistance in MOA conclusion 3.3.1 Revision of O&M Manual to accommodate each LGU 3.3.2 Support/Assistance in OJT for O&M Activities 4.1.1 Introduction of various Flood Control Plans to Targeted LGUs 4.1.2 Lecture on the Benefit and Effect of Flood Control Projects 4.2.1 Introduction of Drainage Improvement Manners based on the Manual of FCSEC-DPWH 4.2.2 Execution of OJT for Formulation of Drainage Improvement Plan/Design	Expert A: Economist Legal Specialist 9.0M/M x Batch Expert B: River Maintenance River/Drainage Plan 4.0M/M x Batch	2016-2019

Table 4.1 River Basins in Long List

Fund *1	Prioritization	River name	Region	Basin Area (km ²)	Project Cost (mil. Pesos)	Project Term (year, phase)	L V M *2	Classification *3
Foreign	1	EAST MANGAHAN	IV-A, NCR	84	3,161	5yrs	L	P(D)
	2	MEYCAUAYAN	III, NCR	154	7,180	5yrs x 2phs	L	O(D)
	3	PANAY/MAMBUSAO	VI	2,311	6,068	5yrs x 2phs	V	M
	4	MINDANAO	XII, ARMM	20,673	15,870	5yrs x 4phs	M	M
	5	NANGALISAN/BAGGAO-PARED(CAGAYAN)	II, CAR	27,743	52,826	5yrs x 4phs	L	M
	6	UPSTREAM of AGNO (include AMBAYAWAN, BANILA)	I	5,722	11,850	5yrs x 3phs	L	P(D)
	7	ILOG-HILABANGAN	VI, VII	2,162	1,638	5yrs	V	M
	8	DAVAO	XI	1,992	1,369	5yrs	M	M
	9	KABILUGAN/VELASCO/BATO LAKE(BICOL)	V	2,999	12,095	5yrs x 4phs	L	M
	10	GUAGUA	III	1,605	31,715	5yrs x 4phs	L	O(D)
	11	CEBU/MANDAWE	VII	241	2,368	5yrs	V	O(D)
	12	UPPER AGUSAN	XI	1,745	2,013	5yrs	M	P(D)
	13	UPPER MARIKINA	NCR, IV-A	515	13,469	5yrs x 4phs	L	P(D)
	14	SAN JUAN	NCR	90	2,260	5yrs	L	P(D)
	15	JALAU	VI	1,534	3,249	5yrs	V	M
	16	TAGUM-LIBUGANON	XI	2,434	3,517	5yrs	M	M
	17	PATALAN/CAYANGA/ANGALACAN	I, CAR	656	2,318	5yrs	L	P
	18	IMUS	IV-A	112	2,377	5yrs	L	P(D)
	19	TUGANAY	XI	747	2,563	5yrs	M	P(D)
	20	UPSTREAM of PAMPANGA(include RIO CHOCO)	III	8,122	21,856	5yrs x 4phs	L	P(D)
	21	SINOCALAN/MAROSOY(DAGUPAN)	I, CAR	1,023	3,890	5yrs	L	P
	22	TAGO	XIII	1,370	2,169	5yrs	M	P
	23	ABULUG	CAR, II	2,766	2,989	5yrs	L	M
	24	ABRA	I, CAR	4,951	2,984	5yrs	L	M
	25	SIBUGUEY	IX	994	2,493	5yrs	M	P
	26	ANGAT	III	917	9,014	5yrs x 3phs	L	P
Local	1	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	V	126	475	5yrs	L	O(D)
	2	KINANLIMAN(REAL-1)	IV-A	10	32	5yrs	L	O
	3	MANDALAGAN(BACOLOD CITY)	VI	187	214	5yrs	V	O
	4	TAGOLOAN	X	1,762	980	5yrs	M	M
	5	AGUS/BUAYAN	ARMM, X	1,898	681	5yrs	M	M
	6	AGOS	IV-A	483	680	5yrs	L	P(D)
	7	SANTA RITA/KALAKLAN(OLONGAPO CITY)	III	102	479	5yrs	L	O(D)
	8	AKLAN	VI	1,010	366	5yrs	V	P
	9	BUAYAN-MALUNGUN	XI, XII	1,400	527	5yrs	M	M
	10	TUMAGA	IX	255	483	5yrs	M	P(D)
	11	MALUPA-DIAN(AGUANG)	III	666	540	5yrs	L	P
	12	DONSOL/MANLATO	V	413	82	5yrs	L	P(D)
	13	GUINABASAN	VII	131	433	5yrs	V	P(D)
	14	DINAGGASAN(CATARMAN-1S)	X	25	117	5yrs	M	O(D)
	15	IPONAN	X	412	357	5yrs	M	P
	16	AMBURAYAN	I, CAR	1,307	676	5yrs	L	P(D)
	17	BALETE	IV-B	132	259	5yrs	L	P
	18	BAGO	VI	868	595	5yrs	V	P
	19	LIPADAS	XI	163	198	5yrs	M	P(D)
	20	TALOMO	XI	279	359	5yrs	M	P(D)
	21	ARINGAY	I, CAR	421	822	5yrs	L	P
	22	BAUANG	CAR, I	510	358	5yrs	L	P
	23	DUNGAAN(PAGBANGANAN)	VIII	176	89	5yrs	V	P
	24	SILWAY-POPONG-SINAUAL(POLOMOLOK)	XII	577	406	5yrs	M	O
	25	CAGAYAN DE ORO	X	1,365	728	5yrs	M	M
	26	CAGURAY	IV-B	361	794	5yrs	L	P
	27	PAMPLONA	II, CAR	698	280	5yrs	L	P
	28	DAGUITAN-MARABONG	VIII	292	308	5yrs	V	P
	29	LAKE_MAINT-TUBAY	XIII	473	214	5yrs	M	P
	30	MATALING	ARMM	420	109	5yrs	M	P
Exceptional Rivers								
		Iloilo (Phase II)	VI					
		Dinalupihan-Hermosa-Lubao	III					

Note: *1:

Locally-Funded Project: (Project Cost) < 1 bil Pesos

Foreign Assisted Project: (Project Cost) > 1 bil Pesos

*2

L: Luzon

V: Visayas

M: Mindanao

*3:

M: Major River Basin

P: Principal River Basin

O: Other River Basin

(D): Vulnerable Basin to flood damage

Table 4.2 Proposed 17 River Basins in the Short List

Group	Rank *1	Short-Listed River Basins			Status of F/S *2	Estimated Total Project Cost *3 (mil. Peso)	Estimated Loan Cost *3 (mil. Peso)	Selected or Assumed Core Areas
		Name of River Basin	Catchment Area (km2)	Region				
A	18	Imus	112	IV-A	Done	1,983	1,190	Bacoor, Imus, Kawit
	-	Bataan(Dinalupihan)		III	Done	2,476	2,105	Dinalupihan, Hermosa, Lubao
B	1	Yawa (Legazpi City)	126	V	on-going	475	404	Tabaco, Legaspi, Ligao, Malilipot, Santo Domingo, Guinobatan, etc
	6	Agos	483	IV-A	on-going	680	578	General Nakar, Infanta, Real
	8	Aklan	1,010	VI	on-going	366	311	Numancia, Kalibo, Makato, Lezo, Malinao, Banga, Balete, etc
	10	Tumaga	255	IX	on-going	483	411	Zamboanga
	13	Guinabasan	131	VII	on-going	433	368	Danao, Tuburan, Asturias
	15	Iponan	412	X	on-going	357	303	Cagayan De Oro, Illigan, Opol, Baungon, El Salvador, Manticao
	16	Amburayan	1,307	I, CAR	on-going	676	575	Tagundin, Alilen, Sudipen, Bangar, Bakun, Sugpon, etc
	17	Balete	132	IV-B	on-going	259	220	Pinamalayan, Gloria, Sablayan
	19	Lipadas	163	XI	on-going	198	168	Davao
	23	Dungcaan	176	VIII	on-going	89	76	Baybay, Mahaplag, Inopacan, Hindang
	24	Silway	577	XII	on-going	406	345	General Santos, Polomolok, Tupi, Malungon, T'boli
	29	Lake Mainit Tubay	473	XIII	on-going	214	182	Tagana-An, Placer, Tubod, Bacuag, Mainit, etc
	C	5	Cagayan (Phase IV)	27,743	II, CAR	Done	3,163	2,698
7		Ilog-Hilabangan	2,162	VI, VII	Done	2,744	2,344	Kabankalan, Ilog
4		Tagoloan	1,762	X	Done	781	638	Tagoloan
Total					15,783	12,915		
Average for One Sub-Projects					928	760		
Average x Assumed Total No. of Sub-Projects (9) x 120%					10,027	8,205		

*1 : The grouping and ranking from "The Nationwide Flood Risk Assessment Study (JICA, 2008)"

*2 : Done; F/S has been conducted. On-going: F/S is on-going by DPWH.

*3 : Group A; F/S has been completed, : Group B; F/S is on-going by DPWH, : Group C; F/S has been conducted under the Sector Loan Preparatory Study

FIGURES

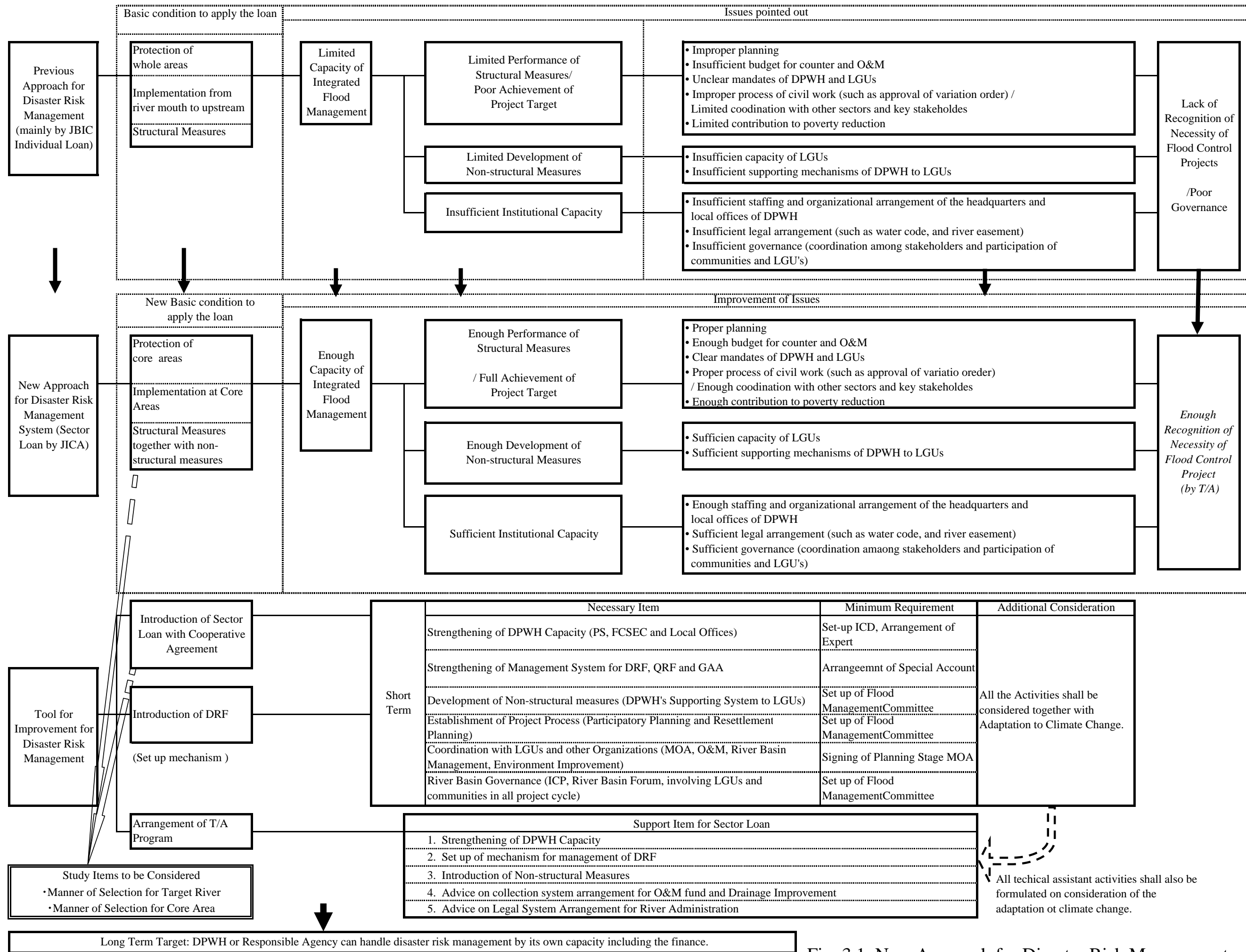
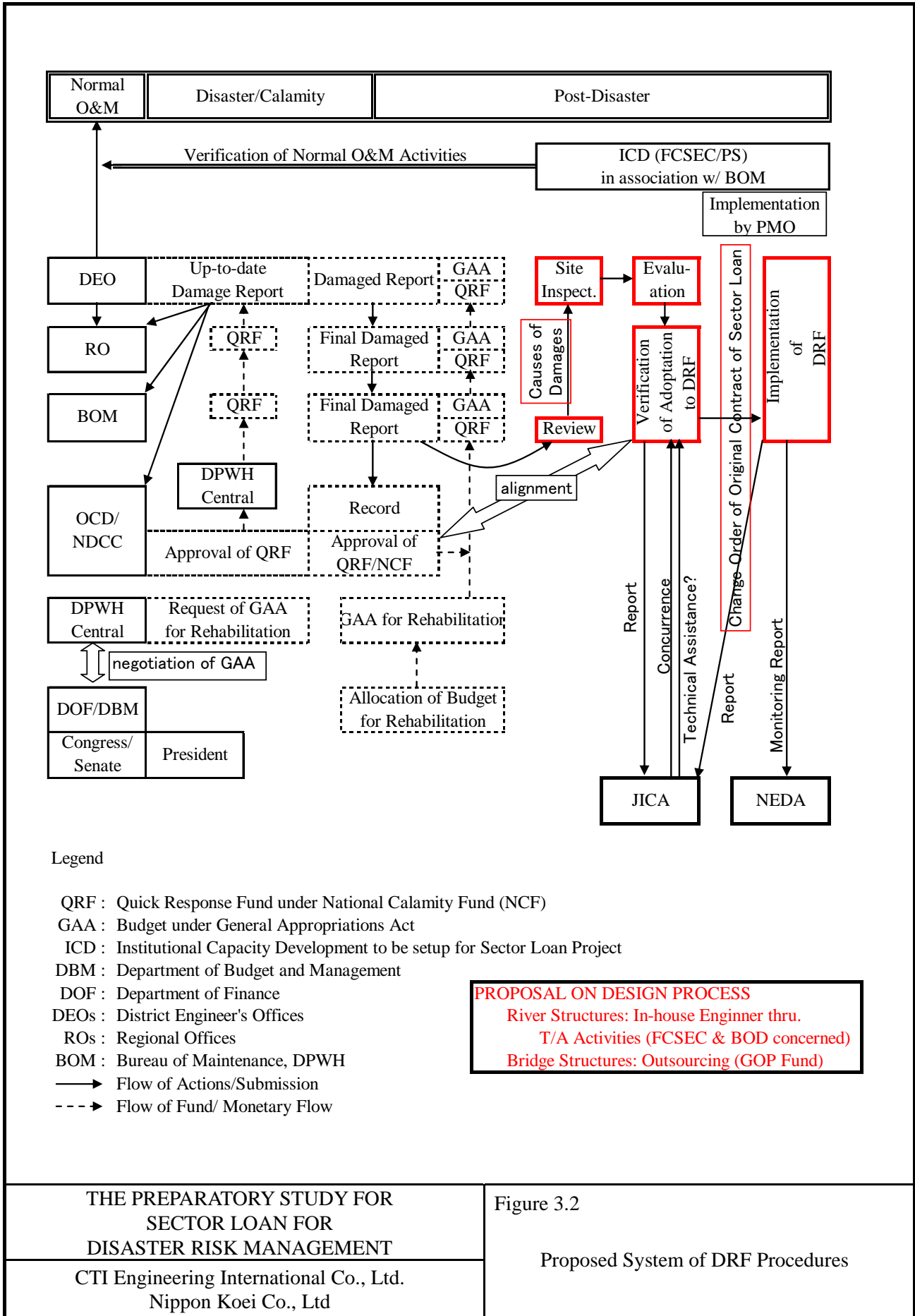
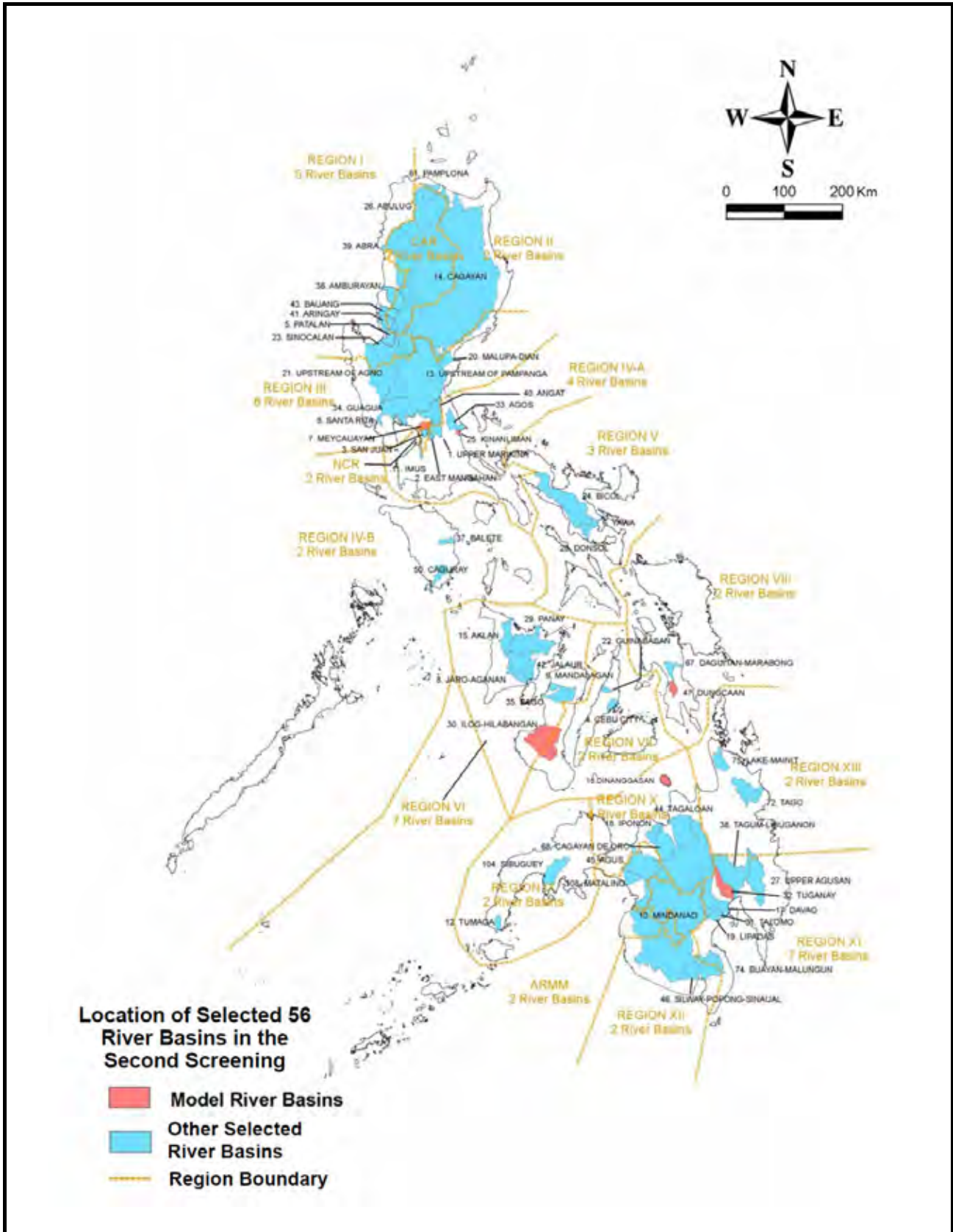


Fig. 3.1 New Approach for Disaster Risk Management





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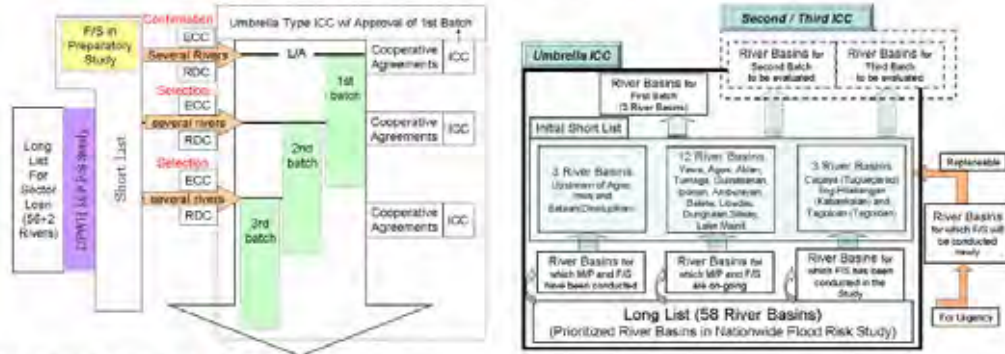
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Figure 4.1
 River Basin in Long List

Procedure of Selection of Sub-Project for Sector Loan

Definition of Long List and Short List:

1. "Long List" means the list containing the name of the fifty eight (56+2=58) river basins that have been proposed and selected as priority areas for implementation of river improvement works or flood control projects during the period 2009-2034.
2. "Short List" means the list containing the name of candidate river basins with completed and/or ongoing feasibility studies to have river improvement works or flood control projects implemented as candidate sub project components of the Sector Loan Project for Disaster Risk Management.



Manner of Selection in Each Batch

First Batch

1. It is deemed that Cagayan (Tuguegarao and suburbs), Tagoloan (Tagoloan) and Ilog-Hilabangan (Kabankalan and suburbs) have been selected since F/S has completed
2. However, the selection is subject to the status of cooperative agreements (conditionality), ICC and other conditions to be cleared.

Second Batch

1. Maximum Number of Projects: (Ns)

$$Ns = \sum (PC_{ij}) < A / 2$$
 where,
 - PC_i : Estimated Cost to be loaned for Candidate Project_(i), I: 1-n
 - $\sum (PC_i)$: Total Costs to be loaned for Project_(1-N)
 - A: Remaining Loan Amount (Total Loan Amount - Amount in First Batch)
 Therefore, in the Second Batch, 50% of Remaining Loan Amount will be utilized.
2. Candidate Projects: Completion of F/S (ECC, RDC) and Conclusion of Cooperative Agreements (MOA) until the second opportune moment. (River Basins of which M/P and F/S has been conducted.) (RDC Approval, Conduct of ELA (ECC), Conclusion of MOA)
3. Candidate Projects will be prioritized based on their EIRR. (The Project of which EIRR is higher than 15%.)
4. Regionality will be well-considered in terms of fair nationwide development policy. (e.g. A Project shall be selected from each Regions, Luzon, Visayas and Mindanao.)
5. As many as possible projects will be selected for the Second ICC Approval.
6. Candidate Projects not selected shall be implemented under the Third Batch.

Third Batch

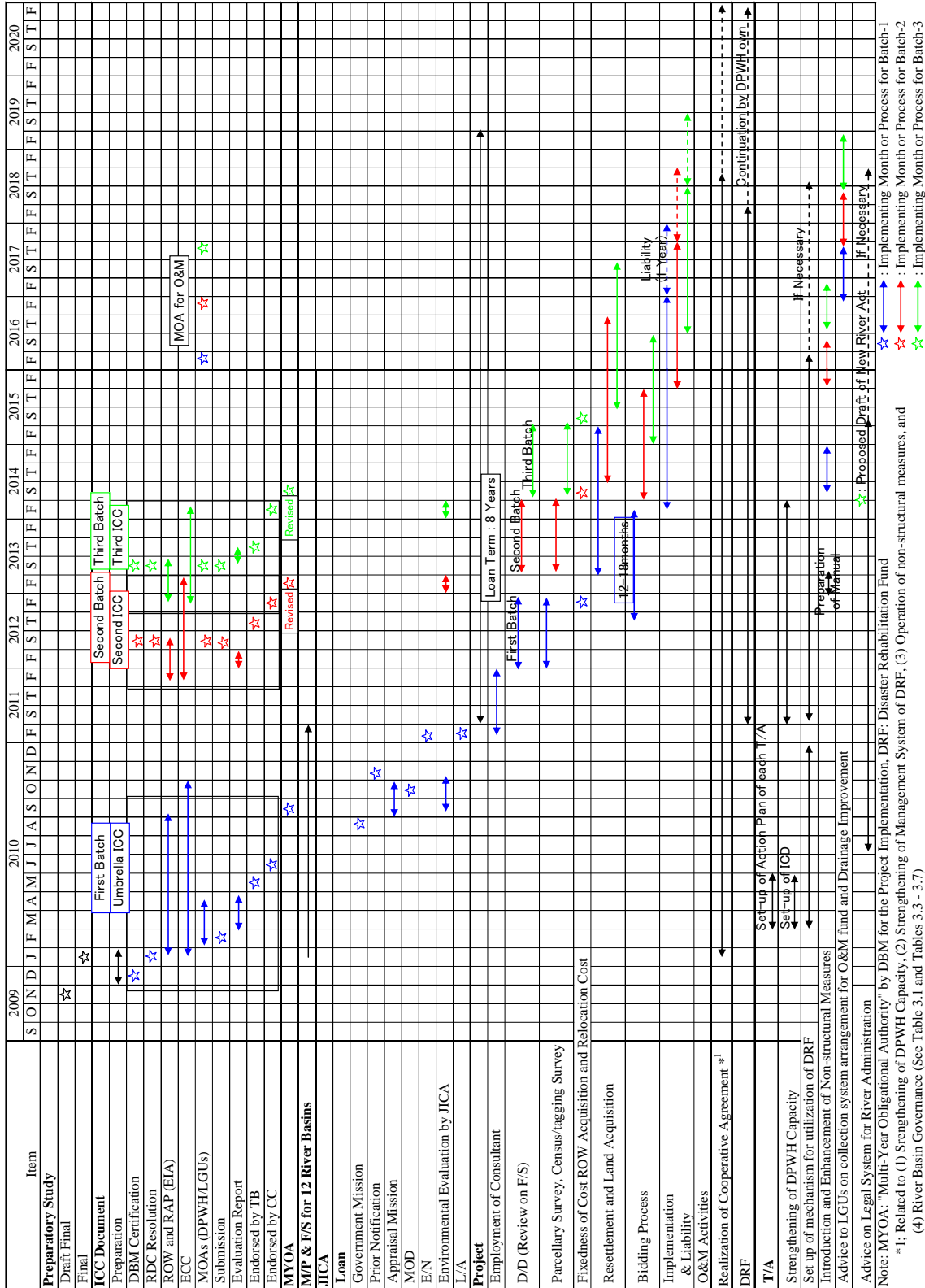
1. Candidate Projects not selected in the Second Batch shall be prioritized.
2. Additional Candidate Projects will be considered for the Third Batch.
3. Additional Candidate Projects will be prioritized based on their EIRR.
4. As many as possible projects that could be accommodated within the limited Loan Amount shall be selected for the Third Batch and submitted to ICC.

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Figure 4.2

Procedure of Selection of Sub-Projects

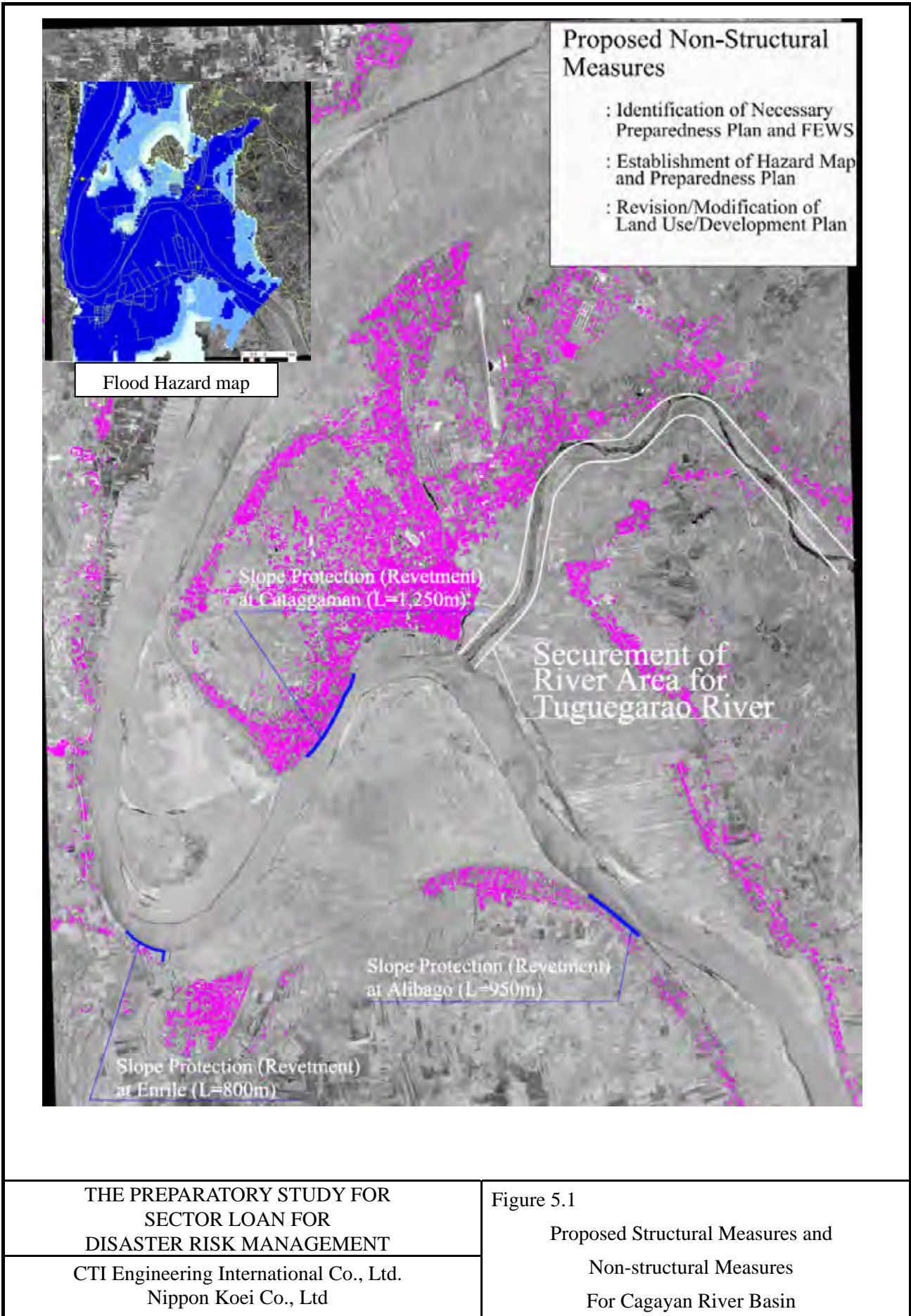


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Figure 4.3

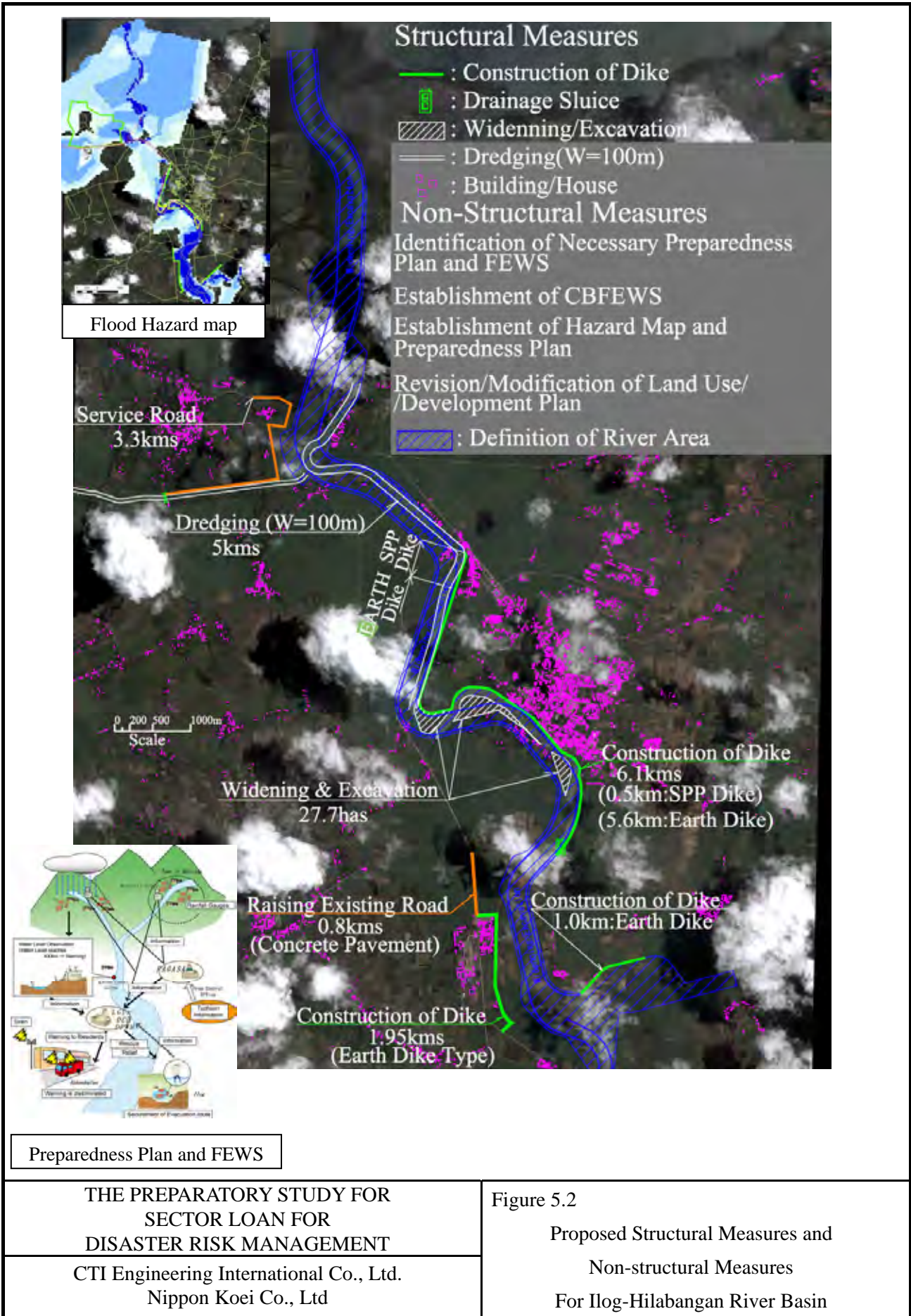
Assumed Implementation Program



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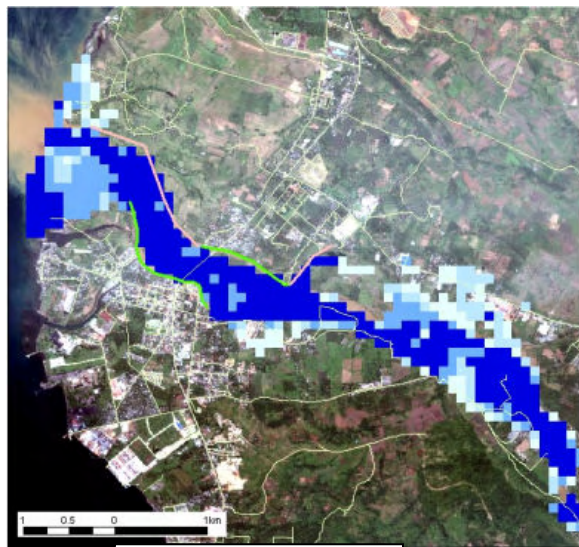
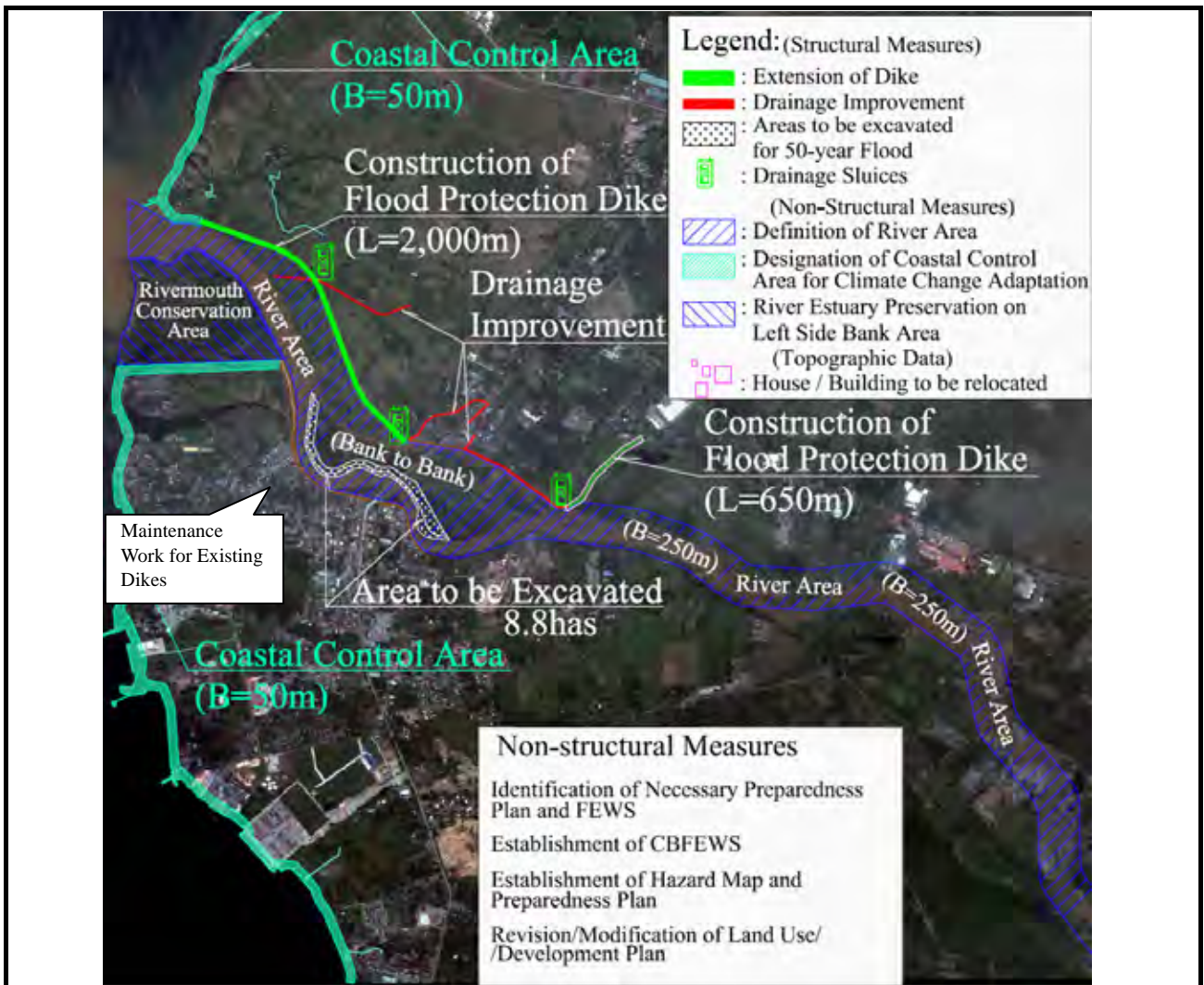
Figure 5.1
 Proposed Structural Measures and
 Non-structural Measures
 For Cagayan River Basin



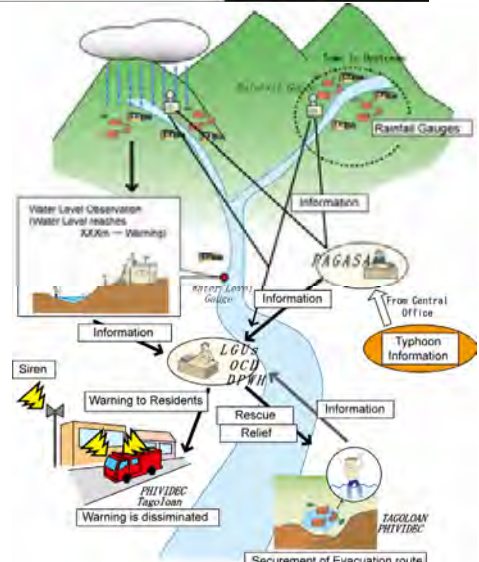
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Figure 5.2
 Proposed Structural Measures and
 Non-structural Measures
 For Ilog-Hilabangan River Basin



Flood Hazard map



Preparedness Plan and FEWS

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Figure 5.3
 Proposed Structural Measures and
 Non-structural Measures
 For Tagoloan River Basin

