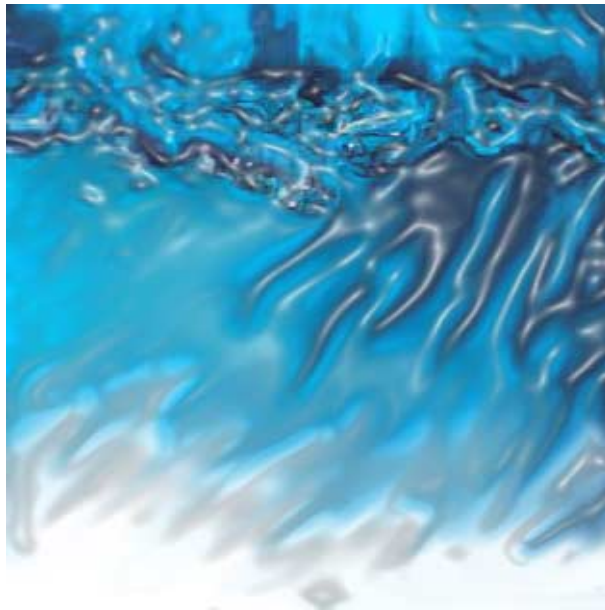


THE SECONDARY WATER RESOURCES PROJECT STUDY

**POVERTY AND FLOODS**  
**Volume 1 MAIN REPORT**



March 2003

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## 1. INTRODUCTION

Poverty and Floods was one of the sessions that discussed issues concerning flood in the Third World Water Forum in Kyoto, Japan, in March 2003. This session was jointly organized by Japan's Ministry of Land, Infrastructure and Transport (MLIT), Japan International Cooperation Agency (JICA), and the Asian Development Bank (ADB) based on the results of several meetings and four regional workshops held in preparation for the Third World Water Forum.

In the Third World Water Forum, Mr. Hidetomi Oi, JICA Senior Advisor, was assigned as Chairman of the Session on Poverty and Floods, and Mr. Senichi Kimura, JICA's Director of the Second Social Development Study Division, was a member of the Discussion Panel. Three out of five case studies involving projects implemented with JICA's cooperation were chosen and presented by the JICA counterpart in each country. JICA also acted as the core of the Preparatory Committee that gathered more than 240 participants, contributing to the successful conclusion of the Session.



**Photo-1 Chairman Hidetomi Oi (JICA Senior Advisor)**

## 2 BACKGROUND OF THE SESSION ON POVERTY AND FLOODS

The session on Poverty and Floods was one of the ten sessions on flood-related issues. However, it was the only session that discussed poverty in relation to floods. The schedule of the ten sessions are shown in Table 1 below.

**Table 1 Schedule of Sessions on Flood Issues in the Third World Water Forum**

Session Name	Date	Organization
Opening Plenary: Floods	18 March, 10:00-12:00	IF Net Preparatory Unit
Sediment-related Issues	18 March, 12:30-15:15	Sediment-related Issues Committee
<b>Poverty and Floods</b>	<b>18 March, 12:30-15:15</b>	<b>River Bureau, MLIT; JICA and ADB</b>
Urban Flood Risk Mitigation	18 March, 12:30-18:30	Netherlands Water Partnership (NWP), Disaster Mitigation Institute (DMI)
Integrated Flood Management People, Flood and Vulnerability in South Asia	18 March, 12:30-18:30	WMO, Bangladesh Unnayan Parishad (BUP)
The Flood Control Measure over the Kamo River in Kyoto, a Historical City	18 March, 15:45-18:30	Kyoto Prefectural Government
Flood Mitigation	18 March, 15:45-18:30	Water in Rivers Secretariat
Flood Warning Dissemination	19 March, 8:45-11:30	DHI Water & Environment
International Flood Network (IF Net)	19 March, 8:45-11:30	Water in Rivers Secretariat
Integrated Flood Management in Deltas and Lowland River Regions	19 March, 8:45-11:30	Ministry of Transport, Public Works and Water Management, The Netherlands
Urban Floods Risk Mitigation	19 March, 8:45-11:30	Netherlands Water Partnership (NWP), Disaster Mitigation Institute (DMI)
Floods Wrap-up Plenary	19 March, 12:30-15:15	IF Net Preparatory Unit

The Water and Poverty Initiative (WPI) is a partnership of many leading international organizations coordinated by the ADB to share interests and commitment to poverty reduction through better water management. MLIT and JICA had decided to join the WPI program and to hold the Session on Poverty and Floods with the ADB as co-host.

JICA, MLIT and ADB cooperated with each other in holding meetings or workshops in the Asian region. Preparatory meetings or workshops were held on different occasions, as shown in Table 2 below.

**Table 2 Schedule of Preparatory Meetings/Workshops on Poverty and Floods**

	<b>Topic</b>	<b>Date</b>	<b>Location</b>	<b>Remarks</b>	<b>Participant</b>
1	Kick-off Meeting	February 2002	Manila, Philippines	ADB planned the “Water & Poverty Initiative” and the first meeting on Poverty and Floods.	JICA Representative Office, Philippines
2	Coordination Meeting on Water & Poverty	May 2002	Manila, Philippines	ADB presented the progress of preparation.	JICA Representative Office, Philippines
3	Meeting on the Poverty and Floods session	July 2002	Tokyo, Japan	Confirmed the Poverty and Floods session by JICA, ADB and MLIT	JICA, ADB, MLIT and Consultant
4	Meeting on Water and Poverty	September 2002	Dhaka, Bangladesh	ADB held Workshop for Case Studies on Water and Poverty. Four cases on JICA projects were presented.	JICA, MLIT and Consultant
5	Meeting on Poverty and Floods	October 2002	Manila, Philippines	JICA, ADB and MLIT held a Workshop	JICA, MLIT and related Officials from Manila
6	Meeting on Poverty and Floods	January 2003	Beijing, China	Participants nationwide. The presentation of case studies was in Chinese.	Consultant attended the Workshop.
7	Meeting on Poverty and Floods	January 2003	Ho Chi Minh, Vietnam	Participants nationwide. Brainstorming was adopted; discussions in Vietnamese.	Consultant attended the Workshop.

The session on Poverty and Floods was held at Room D of Kyoto International Conference Hall on March 18, 2003 as shown in Table 3 below.

**Table 3 Agenda of Session on Poverty and Floods (18 March 2003)**

<b>Time</b>	<b>Duration (min)</b>	<b>Format and Topic</b>	<b>Speaker/Participant</b>	<b>Organization</b>
12:30 – 12:40	10	Opening Remarks	Session Chairman	JICA
12:40 – 14:00	80	Presentation of five case studies	Presenters	Philippines, Indonesia, Bangladesh, China, Vietnam
14:00 – 14:30	30	Panel Discussion	Panel members from MLIT, JICA, ADB and IWHR (PRC)	MLIT, JICA, ADB and IWHR
14:30 – 15:00	30	General Discussion (Q&A)	Session participants and presenters	
15:00 – 15:15	15	Wrap-up	Session Chairman	JICA

### **3. SUMMARY OF THE POVERTY AND FLOODS SESSION**

#### **3.1 Opening Remarks**

The Session began with the introduction of Chairman Hidetomi Oi, JICA's Senior Advisor, by Mr. Marshall Silver, Consultant of ADB.

As Chairman Oi said, the session aims to formulate appropriate means of reducing vulnerability of the poor to the negative impacts of flood.

The objectives of the Session are:

- (1) To examine the impacts of floods, both positive and negative, on people living in flood-prone areas, taking into consideration the wide range of different geographic, climatic, socio-economic, and cultural conditions represented in the Asian region;
- (2) To examine the effectiveness of current flood protection and mitigation measures in terms of (i) higher and better use of natural resources within a river basin; (ii) enhanced economic development; (iii) improved living standards; and (iv) reduced flood hazard and risk for people living in floodplains;
- (3) To identify the best Asian regional practices for managing floods to mitigate their negative impacts and to enhance their positive impacts;
- (4) To provide basic concept for improved flood management with a view to reducing the vulnerability of the poor to floods; and
- (5) To strengthen regional networks linking organizations responsible for formulating policies and practices concerned with flood management and poverty reduction.

#### **3.2 Presentation of Case Studies**

Five case studies involving projects in the Philippines, Indonesia, Bangladesh, China and Vietnam were presented. The case study regarding the project in Bangladesh was

presented in the Asia-Pacific Regional Consultation Workshop on Water and Poverty in Dhaka last September 2002. On the other hand, the Regional Consultation Workshop on Poverty and Floods was held in Manila in October 2002 and case studies regarding projects in the Philippines and Indonesia were presented. Case studies involving projects in China and Vietnam were presented in Beijing and Ho Chi Minh in January 2003, respectively.

The summary of each presentation is given below.

- (1) The case study regarding the Flood Damage Restoration Works with Structures in Ormoc City in the Philippines illustrates the necessity of rapid rehabilitation of flood control works following a disastrous flash flood in a steeply sloped river after a torrential rain. The restoration was designed to provide protection from floods larger than what occurred in November 1991 that left 8,000 dead and missing. All construction works were completed in August 2001 and Ormoc City residents now enjoy relief from the threat of flash flood disasters, producing measurable local poverty alleviation and contributing to the development of the regional economy.
- (2) The case study regarding the Sustainable Management of the Brantas River Basin in Indonesia illustrates the effectiveness of flood protection and mitigation in promoting a balanced regional development and its sustainable management. It is a case study on how economic development contributed to poverty alleviation. The development project consisted of multipurpose dams, river improvement works, irrigation systems, drainage systems, and other mainly structural flood management measures. The focus of most newly built components of the project in recent years has shifted to nonstructural measures, including for example the integration and improvement of river basin management systems and the implementation of flood forecasting and warning systems to mitigate or prevent future flood disasters.
- (3) The case study regarding the Flood-Proofing and Livelihood Improvement in Bangladesh illustrates the importance of flood-proofing as a complementary measure to structural flood protection to reduce risk and vulnerability of poor people. In Bangladesh, floods are a recurring phenomenon that necessitates *living with floods* as a way of life. Most farmers have no other means of livelihood and are highly vulnerable to flooding. Flood mitigation projects include small-scale flood control works complemented by training and social support systems to generate new means of producing income, and improvement of living conditions through better primary health care, promotion of self-reliance, local participation in community decision-making, and flood-proofing of houses. Poverty alleviation is an integral part of a project that builds on the participatory approach, and includes self-managed savings and credit programs, cost-sharing, and institutional building.
- (4) The case study regarding “Lessons Learned from Operation of Flood Detention Basins in China” illustrates the potential for reducing the cost of flood control measures while also enhancing environmental conditions and the safety of poor people living in flood-prone areas. In the past 50 years traditional areas used for flood retention basins have been given over to agriculture, aquaculture, and many other types of rural development incompatible with the former nature of the natural wetlands of these flood control basins. The government is currently undertaking a major effort to

reestablish 98 of these former wetland flood detention areas along the Changjiang River, the Yellow River, the Huai River and the Hai River to store excess floodwaters and to reduce floodwater peaks. The total area of these rehabilitated flood detention areas will be 35,000 square kilometers with a natural storage area of 98 million cubic meters. The major problem facing the government in reestablishing these traditional flood retention basins is to mitigate the impacts of controlled flooding on the 18 million people currently living within these basins. This case study considers the government's plans and actions to mitigate the impacts of this nonstructural flood mitigation measure through development of the local economy, better flood management planning, construction of flood resistant infrastructure, and improvement of the capacity of local officials and households to recover from the negative impacts of controlled flooding within flood retention basins in the shortest period of time.

- (5) The case study regarding "Living with Floods in the Mekong River Delta of Viet Nam" illustrates the benefits of incorporation in the flood management strategy of low-tech measures and traditional coping techniques to enhance safety and improve incomes in a large area subject to annual flooding lasting several months. One of the favored low-impact options being developed for living with floods in moderate flooding areas is providing low cost loans to households to raise their individual houses on piles above the highest expected flood water level. Another strategy in deep flooding areas is to build elevated earthen homesteads above the highest flood water level for entire villages, either as satellite villages or as linear areas along flood evacuation roads. This case history describes the positive and negative perceptions of these and other nonstructural methods for keeping people safe from annual flooding from the perspective of the flood impacted households themselves. Also discussed was the formulation of a self-funding Water Disaster Self-Reliant Fund to provide the most disadvantaged individuals and households with means to resume their livelihood and for local government to recover from floods in the shortest possible period of time at the end of the cycle of annual flooding in the Mekong Delta.

### 3.3 Panel Discussion

Discussed by the Discussion Panel were poverty and flood issues based on the policy of each organization and the experience of panellists. Panel members are listed in Table 4 below.

**Table 4 Discussion Panel Members**

	<b>Name</b>	<b>Position</b>	<b>Organization</b>
1	Shun-ichi Maeda	JICA Expert for Water Resources Policy	MLIT
2	Senichi Kimura	Director	JICA
3	Ian B. Fox	Principal Project Specialist	ADB
4	Cheng Xiaotao	Director	Institute of Water Resources and Hydropower Research, IWHR

The comments of panellists are summarized below.

- Physical solutions for floodwater include drainage that can change wetlands into productive agricultural lands, resulting in a flood-protected area with better transportation facilities, better housing, and less water-borne diseases.
- Lessons learned from the case study regarding projects in China and Vietnam can contribute to the reduction of poverty by conserving the positive impacts of floods.
- The gap between the rich and the poor is reflected in the flood management strategy. To reduce vulnerability of the poor, the flood management strategy should consider the means of reducing the gap.

During the discussion, Mr. Senichi Kimura of JICA recommended the pro-poor approach to projects, as follows:

- To prioritize projects, aiming at poverty reduction in the project screening process;
- To promote more participation of the poor in decision-making, from project formulation to project implementation; and
- To promote projects that can give maximum benefits to the poor.



**Photo-2 Panel Discussion**

### **3.4 Comments of the Audience**

Questions and comments of participants were accepted and responded by the panellists. Some of the comments are summarized in the main conclusions and recommendations, including the action plans proposed and agreed upon by the session participants. Conclusions are incorporated in the Theme Paper on Poverty and Floods.

Comments of the audience regarding the draft conclusions of the session are listed below.

- The recommendation regarding government control on changing land-use modes should be a strong outcome of the session.
- To target the amount of reduction of flood-induced poverty to be planned from Third World Water Forum to the next WWF.
- Efforts to better clarify and quantify the economic impacts of floods on the poor through better data collection and information gathering.
- The poor must be involved in the planning, implementation and management of flood control programs and projects.
- To study environmental causes that increase the frequency and magnitude of floods.
- Nonstructural methods of flood preparedness should be emphasized over structural methods of flood control.
- Knowledge on the biological impacts of a flood is an important issue for the poor.
- Capacity building for design, construction, operation and maintenance is necessary on the community level.



**Photo-3 Audience at the Poverty and Floods Session**

### **3.5 Actions and Recommendations**

Chairman Hidetomi Oi wrapped-up the session by summarizing conclusions and recommendations. He also proposed that the draft Theme Paper should contain the following:

- In the selection of projects, priority should be placed on projects that will contribute more to poverty alleviation, by including “poverty alleviation” in the criteria for project selection.
- In the decision-making process of projects, opinions of the poor should be appropriately reflected, so as to minimize the adverse impact and to maximize the beneficial impact of projects for the poor.
- Likewise, in the design of projects, livelihood improvement, job creation and other pro-poor elements should be considered, in order for the poor to benefit from the projects as much as possible.
- Different approaches should be adopted according to the condition of flood prone areas: High priority areas should be identified through the regional and river basin planning for a high standard of flood protection; while in other areas the provision of protection of essential sources of livelihood, as well as maintenance of the benefit of positive impacts of floods to agriculture, aquaculture, etc., should be considered.
- Flood containment with a high standard of protection is recommended for urban and densely populated areas. Other areas should adopt domestic flood-proofing methods to maximize the beneficial impact of floods.
- The advantage of traditional means of coping with frequent, low-intensity floods developed by communities should also be considered.
- Flood vulnerability analysis should be the starting point of preparation and operation for a flood mitigation and management plan.
- In view of the ever-increasing vulnerability to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to local conditions.

## **4. SESSION REPORT TO THE PLENARY ON FLOOD ISSUES**

After the session on Poverty and Floods, a session report was prepared by the co-hosts (JICA, MLIT and ADB) and submitted to the Secretary of the Third World Water Forum. The report was presented by Mr. Marshall Silver in the Plenary on Flood Issues.

The summary of discussion, action plan and recommendation was finalized considering the comments of the Plenary and submitted as a session report to the secretariat of WWF3 as follows;

- Flood vulnerability of the poor has been increasing as a result of the cycle of population growth, environmental deterioration and the increase in number of poor people living in high flood risk areas.
- The lack of capacity to limit the negative impact of floods remains a major burden for developing countries; mainly due to limited resources and the unlimited need for these resources to address pressing issues in all sectors of development.
- Thus, despite the achievements made to date, flooding has been increasing in terms of frequency, damage and vulnerability of the poor, aggravating poverty conditions and hampering the social and economic development of communities, regions, or countries.

#### Main Points Raised at the Session on Poverty and Floods

- Learning to “live with floods” based on local conditions - for both positive and negative impacts.
- Better data collection and information gathering is needed to quantify impacts on the poor.
- Capacity building at the grassroots for design, construction, operation and maintenance.
- Preparedness, including capacity building, flood insurance and ongoing maintenance.
- Appropriate structural measures together with non-structural measures.
- From now to the next WWF, how much flood induced poverty do we plan to reduce.

#### Conclusions/Recommendations

- In the selection of projects, priority should be placed on projects that will contribute more to poverty alleviation, by including “poverty alleviation” in the criteria for project selection.
- In the decision-making process of projects, the opinions of the poor should be appropriately reflected, to minimize the adverse impact and to maximize the beneficial impact of flood projects for the poor.
- Likewise, in the design of projects, the improvement of livelihood, job creation and other pro-poor elements should be considered, in order for the poor to benefit from the projects as much as possible.
- Different approaches should be adopted for the poor according to the conditions of the flood prone area. High priority areas should be identified through regional and river basin planning for a high standard of flood protection; while, in other areas the provision of protection of essential sources of livelihood, as well as the maintenance of benefits derived from positive impacts of floods to agriculture, aquaculture, etc., should be considered.
- In view of the ever-increasing vulnerability of the poor to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to the local conditions.

## Session Report

**SESSION CODE: FLOD - 03**

**Reporter/Rapporteur: Marshall Silver**

**Contact E-mail : marshallsilver@yahoo.com**

### 1. Key Issues

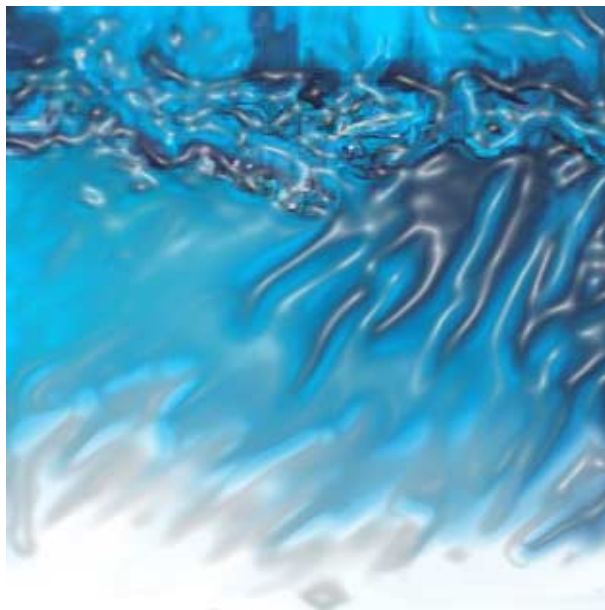
- Millions of people suffer from floods every year through loss of life, property, means of livelihood, social services and access to vital infrastructure. These adverse impacts affect the poorest segments of the society most severely
- Flood vulnerability of the poor has been increasing as a result of the cycle of population growth, environmental deterioration and the increase in the number of poor living in high flood risk areas
- The lack of capacity to limit the negative impact of floods remains a major burden for developing countries; mainly due to limited resources and the unlimited need for these resources to address pressing issues in all sectors of development
- Thus, despite achievements made to date, flooding has been increasing in terms of frequency, damage and vulnerability of the poor; aggravating poverty conditions and hampering the social and economic development of communities/regions/countries

### 2. Actions and Recommendations

- In the selection of projects, priority should be placed on projects, which will contribute more to poverty alleviation, by including “poverty alleviation” in the criteria for project selection.
- In the decision-making process of projects, opinions of the poor should be appropriately reflected, so as to minimize the adverse impact and to maximize the beneficial impact of the projects for the poor.
- Likewise, in the design of projects, livelihood improvement, job creation and other pro-poor elements should be considered, in order for the poor to benefit from the projects as much as possible.
- Different approaches should be adopted according to the conditions of flood prone areas: High priority areas should be identified through regional and river basin planning for a high standard of flood protection; while in other areas providing protection of essential sources of livelihood, and maintaining the benefit of positive impacts from floods for agriculture, aquaculture, etc.
- The advantage of traditional means of coping with frequent, low-intensity floods developed by communities should also be considered.
- Flood vulnerability analysis should be the starting point of preparation and operation for flood mitigation and management plan.
- In view of the ever increasing vulnerability to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to local conditions.

THE SECONDARY WATER RESOURCES PROJECT STUDY

**POVERTY AND FLOODS**  
**Volume 2      DATA BOOK**

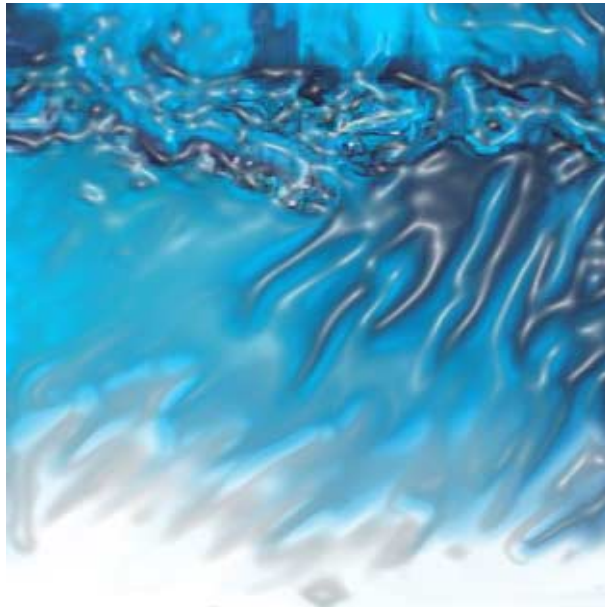


March 2003

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# **1. PRESENTATION PAPER**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

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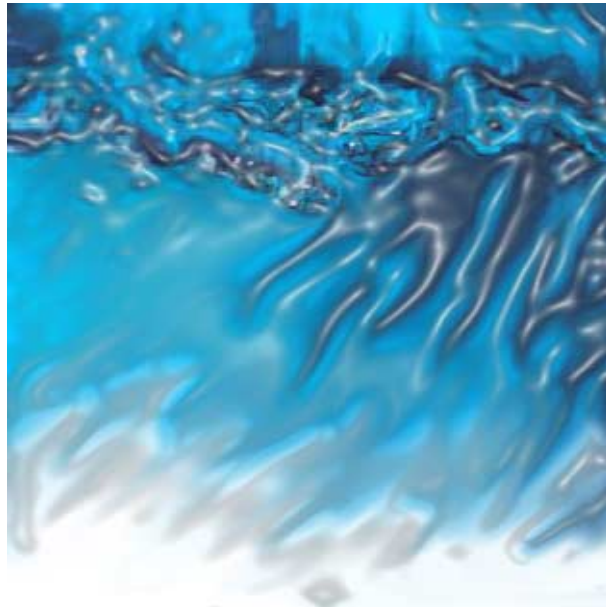
## **(1) CHAIRMAN'S SPEECH**

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### **Chairman's Speech**

**Mr. Hidetomi OI**

*Senior Advisor,  
Institute for International Cooperation, JICA,  
Japan*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

## Session: “POVERTY AND FLOODS” in the Cross-Cutting Issue of “Floods”

Organized and Sponsored  
By

Ministry of Land, Infrastructure and  
Transportation, Japan (MLIT)  
Japan International Cooperation Agency (JICA)  
Asian Development Bank (ADB)

1

### Session Purposes

To formulate appropriate means of reducing  
vulnerability of the poor to floods by learning  
lessons from:

- ◆Regional Workshops : Bangladesh, the  
Philippines, China and Vietnam
- ◆Case studies : Philippines, Indonesia,  
Bangladesh, China and Vietnam

2

### Objectives of the Session

“Poverty and Floods” session, one of the 13 sessions under the issue of “FLOODS”, has the following objectives:

- ◆ To examine the impacts of floods, both positive and negative;
- ◆ To examine the effectiveness of current flood protection and mitigation measures; .
- ◆ To identify the best practices;
- ◆ To provide basic concept for improved flood management with a view to reducing the vulnerability of the poor to floods; and
- ◆ To strengthen regional networks

3

### Operation Plan of the Session

- 1) Presentation of 5 Case Studies  
in the Philippines, Indonesia,  
Bangladesh, China, and Viet Nam.
- 2) Panel Discussion
- 3) Q&A and General Discussion
- 4) Wrap Up

4

## Submission Flow of Session Statement

“Poverty and Floods” Session Statement



“Floods” Wrap Up Session



WWF3 Secretariat



Ministerial Conference

5

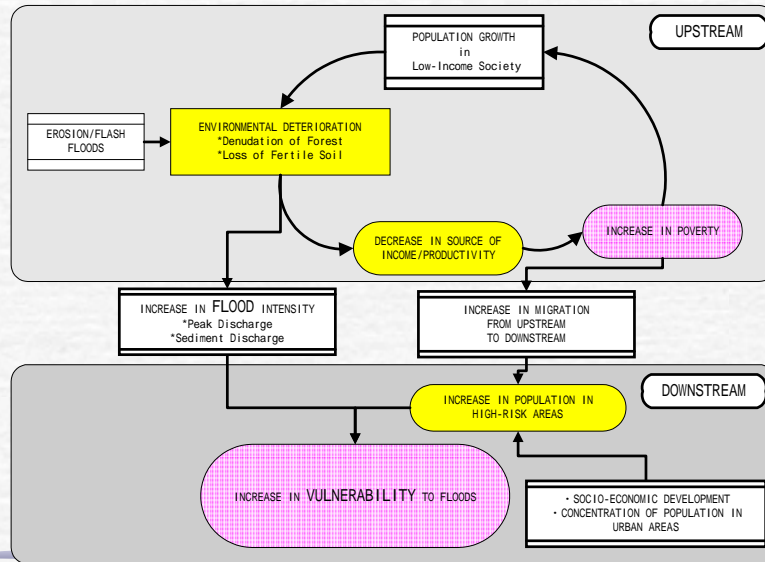
## Regional Workshops

WORKSHOP	DATE	VENUE	SUMMARY OF OUTCOMES
Asia-Pacific Regional Consultation Workshop On Water and Poverty	22 – 26 September 2002	Dhaka, Bangladesh	<ul style="list-style-type: none"> <li>In applying the existing policies/strategies, focus should be on reducing impact of floods on the poor.</li> <li>In adopting new policies/strategies, their impact on the poor should be assessed and considered.</li> <li>All stakeholders including the poor and women should be involved in all development projects.</li> <li>Flood Proofing with Livelihood Improvement can be a model for the pro-poor approach which aims at poverty reduction through variety of activities to be proposed based on socio-economic survey on flood - poverty linkage</li> </ul>
Regional Consultation Workshop on Poverty and Floods	17-18 October 2002	Manila, Philippines	<ul style="list-style-type: none"> <li>Traditional FMM have been effective for poverty reduction. However, flood loss/damage is increasing as vulnerability increases by concentration of population especially the poor in areas at risk</li> <li>FMM should be more effective through integrated approach (hard + soft, flood mitigation + water use + environment conservation) with the basin as a unit.</li> <li>FMM should be more pro-poor through inclusion of poverty reduction components, targeting poorer societies, and conducting social/economic survey prior to project planning.</li> </ul>
Asia-Pacific Regional Workshops on Poverty, Floods, and Gender: National Consultation on the Impact of Floods, Drought, and Other Water Disasters on the Poor	9-11 January 2003	Beijing, People's Republic of China,	<ul style="list-style-type: none"> <li>Floods Mitigation Should be Consistent With Aqua-Agricultural Development</li> <li>Flood Proofing is Very Effective Measure for Farmland Flood Management.</li> <li>There is potential to develop effective and affordable flood damage insurance for crops and property,</li> </ul>
Asia-Pacific Regional Workshops on Poverty, Floods, and Gender: National Consultation on the Impact of Floods, Drought, and Other Water Disasters on the Poor in Viet Nam's Mekong Delta	20-22 January 2003	Ho Chi Minh City, Viet Nam,	<ul style="list-style-type: none"> <li>“Living with floods” can be a basic principle for flood risk reduction and poverty alleviation in areas like Mekong Delta where deep and extended flooding is a perennial phenomenon, to minimize the negative impact and maximize the positive impact of flood.</li> </ul>

6

Session Title: <2-8-7> Poverty and Floods

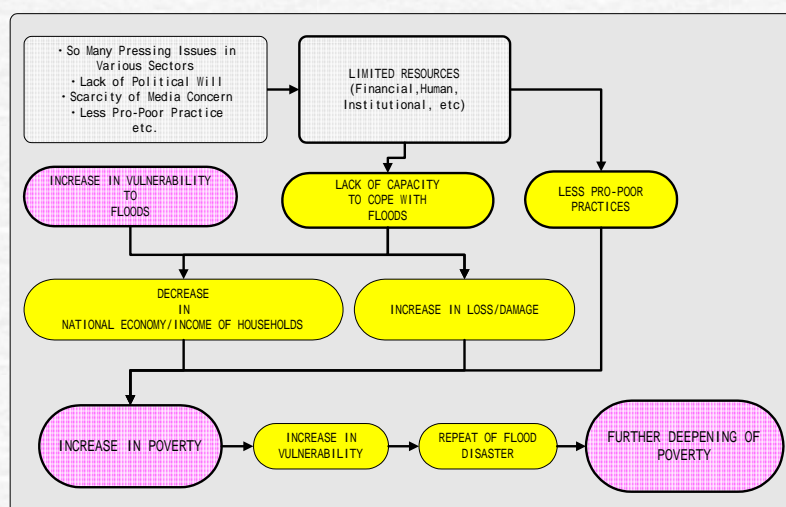
## INCREASE IN VULNERABILITY TO FLOODS



7

Session Title: <2-8-7> Poverty and Floods

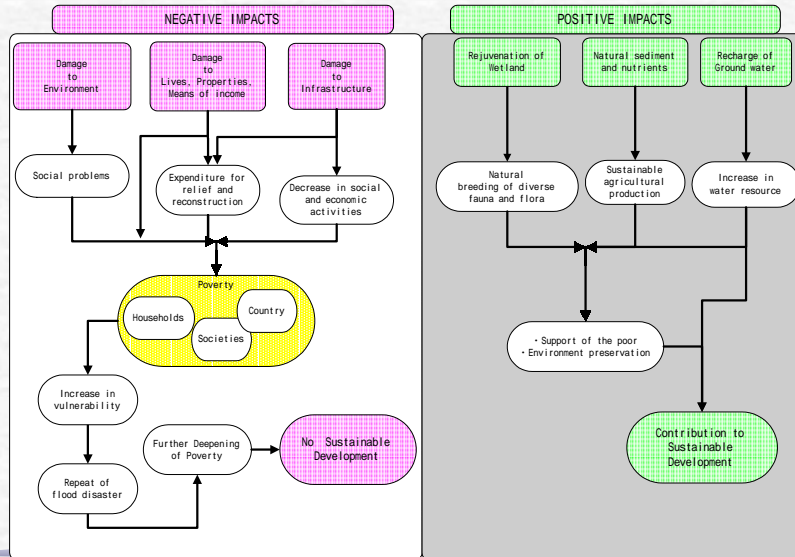
## FLOODS – VULNERABILITY – POVERTY LINKAGE



8

Session Title: <2-8-7> Poverty and Floods

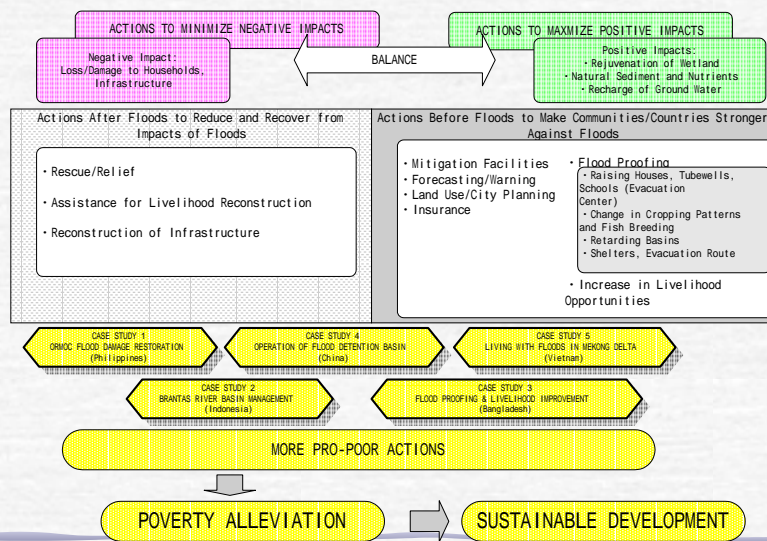
## NEGATIVE AND POSITIVE IMPACTS OF FLOODS



9

Session Title: <2-8-7> Poverty and Floods

## ACTIONS OF FLOOD MITIGATION AND MANAGEMENT FOR POVERTY ALLEVIATION



10

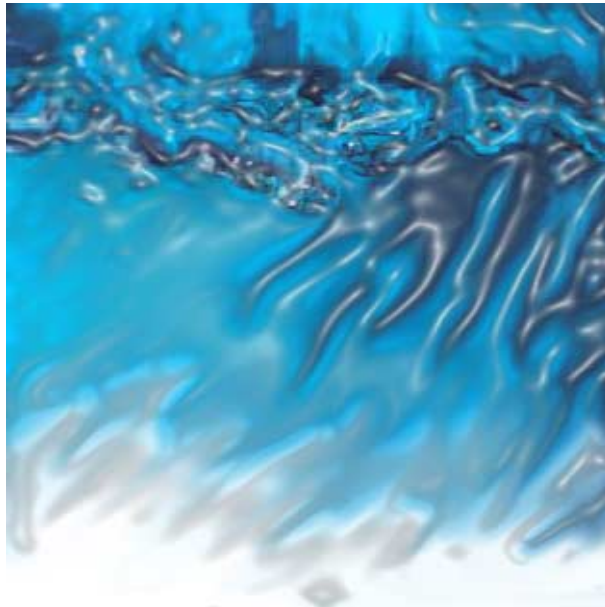
## IN CONCLUSION

- ◆ Poverty specific discussion and conclusion;
- ◆ From rhetoric to concrete actions; and
- ◆ Importance and timeliness of the session  
“Poverty and Floods”

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## **(2) CASE STUDY**

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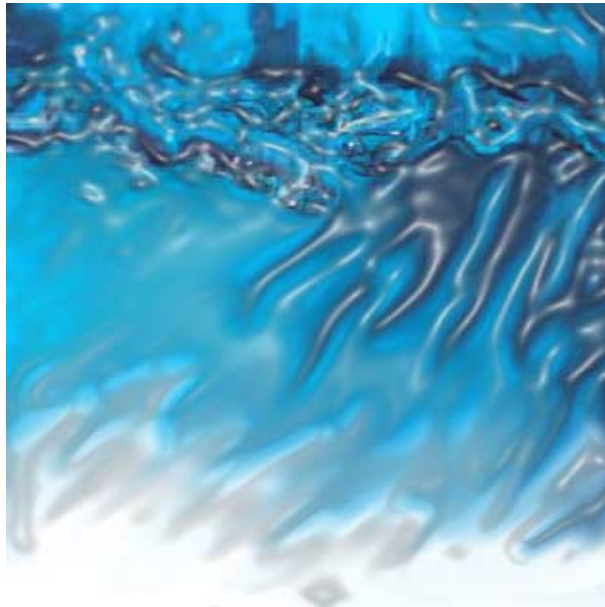


**THE SECONDARY WATER RESOURCES PROJECT STUDY**

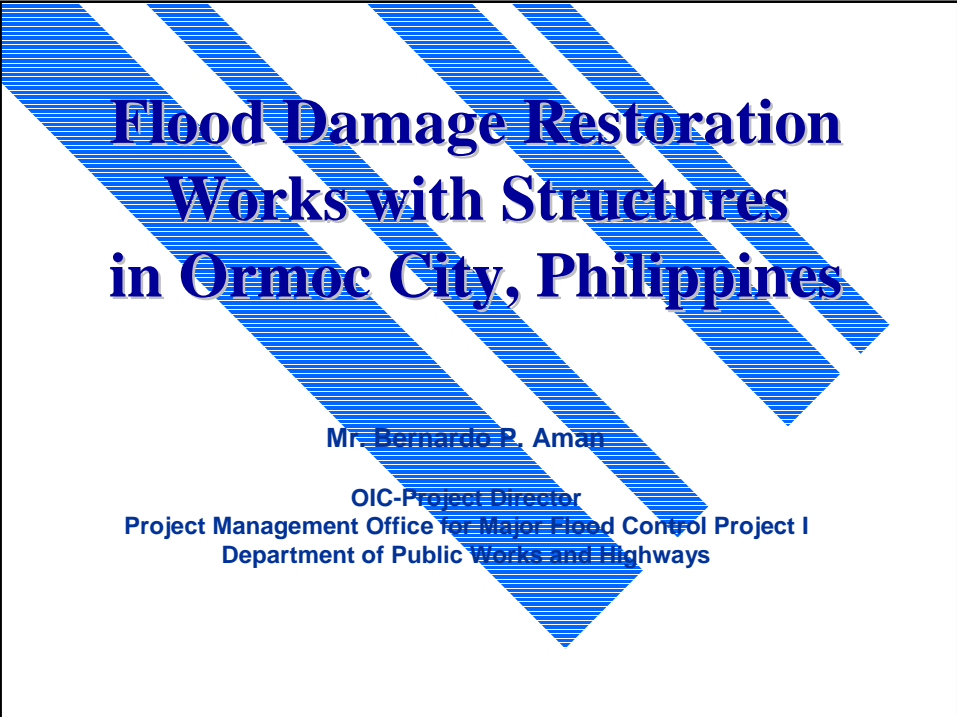
# Case Study-1, Flood Damage Restoration Works with Structures in Ormoc City, Philippines

**Mr. Bernardo P. Aman**

*OIC-Project Director,  
Project Management Office for Major Flood Control Project I,  
Department of Public Works and Highways,  
Philippines*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**



# **Flood Damage Restoration Works with Structures in Ormoc City, Philippines**

**Mr. Bernardo P. Aman**  
OIC-Project Director  
Project Management Office for Major Flood Control Project I  
Department of Public Works and Highways

**Project Management Office for Major Flood Control Project I**  
**Department of Public Works and Highways**

## Location



Philippine Islands

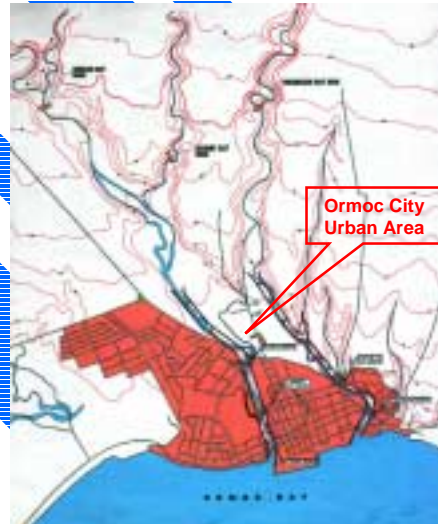


Ormoc City in Leyte, Visayas

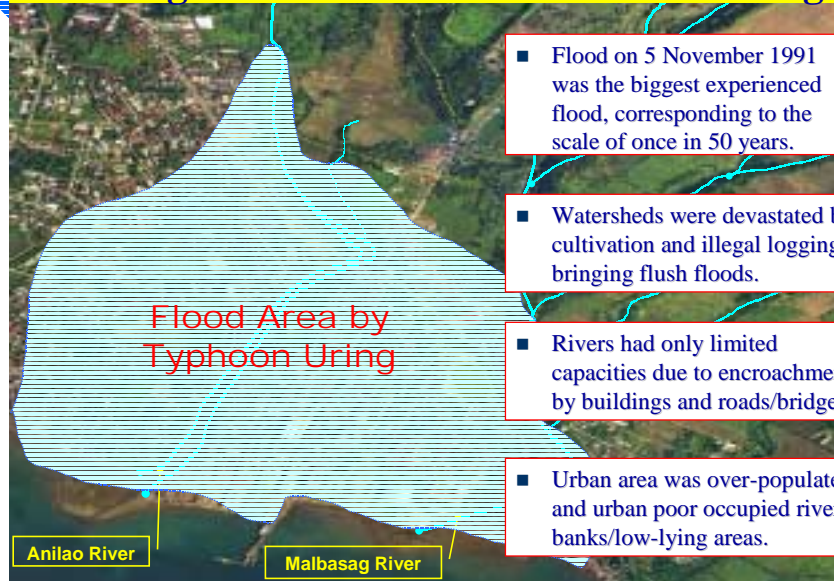


## Ormoc City was ---- on 5 November 1991

- Ormoc City is situated between two rivers: Anilao River and Malbasag River.
- Ormoc City is 464.3 km<sup>2</sup> with its area, while urban area is only 3.8 km<sup>2</sup> on the deltaic land of the two rivers.



## Typhoon Uring on 5 November 1991 brought the most disastrous flood damage.



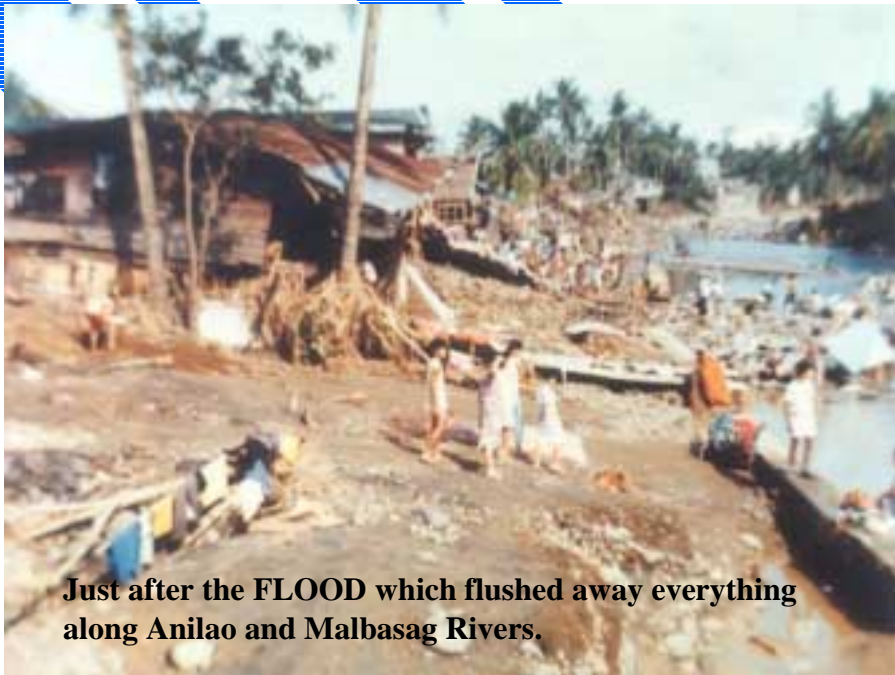
- Flood on 5 November 1991 was the biggest experienced flood, corresponding to the scale of once in 50 years.
- Watersheds were devastated by cultivation and illegal loggings bringing flush floods.
- Rivers had only limited capacities due to encroachment by buildings and roads/bridges.
- Urban area was over-populated and urban poor occupied river banks/low-lying areas.

*On 05 November 1991, Typhoon Uring brought torrential rain and flush flood hit the city core of Ormoc.*



**Flood water swept over the City's core area of 4 km<sup>2</sup>.  
with the depth of 1.5 m to 2.5 m.**





**Just after the FLOOD which flushed away everything along Anilao and Malbasag Rivers.**



**Deep Flood Inundation in Low-lying Area**

## Damage in 1991 Flood

(caused by Typhoon Uring)

- **7,922 persons death/missing**
- **13,760 houses destroyed (2,850 totally & 10,910 partially)**
- **More than US\$23 million worth of damage to properties and infrastructures.**
- **Most of the victims were the urban poor who had dwelled on river banks and flood-prone area !**

## Project Implementation

- Project was implemented by the Republic of the Philippines with the Japanese Grant-Aid Program through JICA.
- DPWH acted as the Executing Agency and its Project Management Office for Major Flood Control Projects (PMO-MFCP) is responsible for actual implementation
  - Design to construction, and
  - Maintenance and operation thereafter.





**The desire and will of the people is further manifested in the speedy and smooth relocation/resettlement of informal dwellers.**



Statue of Engineer worked for the Project



Typical House of Resettler



Town Street and Houses

**Resettlement Area in Barangay Lao (Outskirt of Ormoc City)**

## **Project Benefits**

- ✓ On 18 February 2001, floodwater of a typhoon of the same magnitude as Typhoon Uring that caused the “Ormoc Tragedy of 1991” was satisfactorily disposed by the Project.

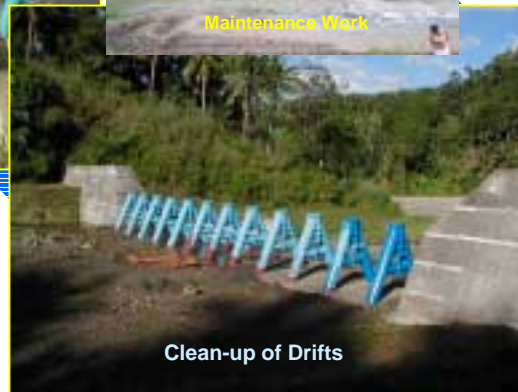
## Operations and Maintenance

- A Flood Mitigation Committee was organized including the City, Barangay (County), NGOs, DPWH-4<sup>th</sup> LED and DPWH-PMO-MFCP.
- Actual operation and maintenance work is undertaken by the Technical/Monitoring Section of the Office of City Engineers.
  - Vegetation control;
  - Removal and disposal of garbage in the rivers;
  - Declogging of lined canals and culverts;
  - Repair/restoration/replacement of project facilities.
- Budget for 2002 is US\$ 74 thousand.

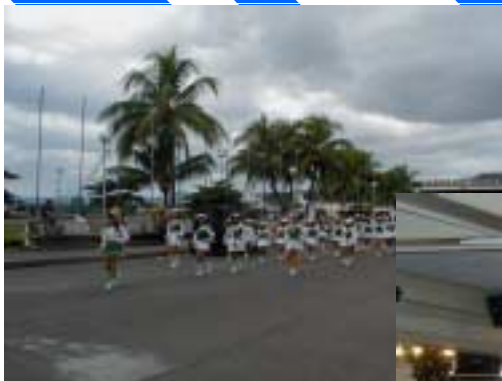
## Maintenance of River: Cleaning and Removing Wastes



## Maintenance of Slit (Sabo) Dam



## River Festival and Seminar for O&M



Ormoc City Mayor and Chairman:  
Mr. Calmero J. Locsin in the Seminar





**Painting contest on the river bank in the River Festival on Dec. 4, 2003**



**Winning paint in the River Festival on Dec. 4, 2002.**



**River becomes a part of people's life.**



**Malbasag River Mouth after Project**

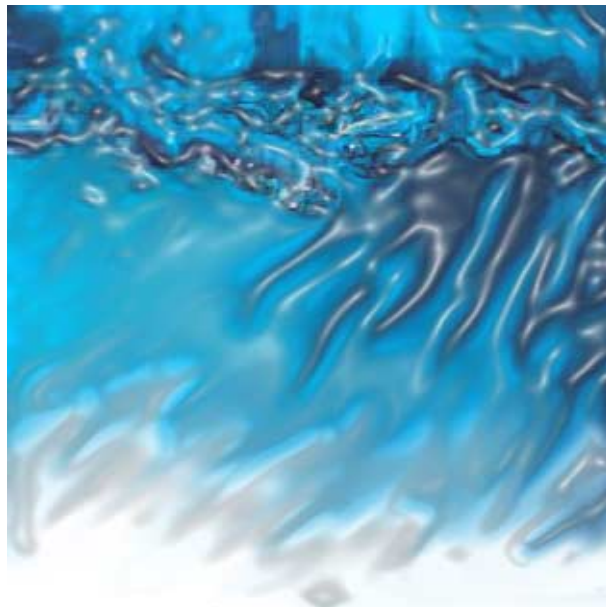
## Concluding Statements

- It is clarified among the residents that if this project was not implemented, another destruction could have happened during those heavy rains, resulting in the devastation of river environment.
- It is well understood that the early involvement of people in realizing the project structures as well as preparing the operation and maintenance program has resulted in a smooth implementation of the Project and facilitation of expeditious institutional set-up/budgets for efficient conduct of O&M activities. In fact, the organization of Flood Mitigation Committee for the O&M of the flood control facilities is the first practice in the Philippines, further it actually proves a well understanding on maintenance works.
- All indications lead to the conclusion that project works and their maintenance activities can attain the sustainability of flood control works, conservation of river environment and alleviation of poverty for the area, as it radiates its effects to the region and the national economy as a whole.

# Case Study-2, Sustainable Management of the Brantas River Basin in Indonesia

**Usman Rusfandi**

*President,  
Jasa Tira Public Corporation, Indonesia*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**



The map displays the Brantas River Basin, a major water resource in East Java. Key features include the Brantas River flowing from the south towards the north, where it empties into the Madura Strait. Numerous dams and water control structures are marked, including Bening Dam, Glatk Dam, Wonorejo Dam, Tulungagung Gate, Mrican Barrage, Selorejo Dam, K. Kanto Dam, Lahor Dam, and Sengguruh Dam. Irrigation areas such as Warujayeng, Lodojo, and Pajajaran are also indicated. The map includes labels for major cities like Surabaya, Malang, and Kediri, as well as geographical features like Mt. Kelud and Mt. Wilis. The title is overlaid in large, bold, red capital letters.

# SUSTAINABLE MANAGEMENT OF THE BRANTAS RIVER BASIN IN THE REPUBLIC OF INDONESIA

by

Achmad RUSFANDI Usman  
Brawijaya University, Indonesia

KYOTO, 18 March 2003

# SUSTAINABLE MANAGEMENT OF THE BRANTAS RIVER BASIN

## EAST JAVA PROVINCE, INDONESIA

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### Page-1 MAP OF FLOOD CONTROL STRUCTURES IN THE BRANTAS RIVER



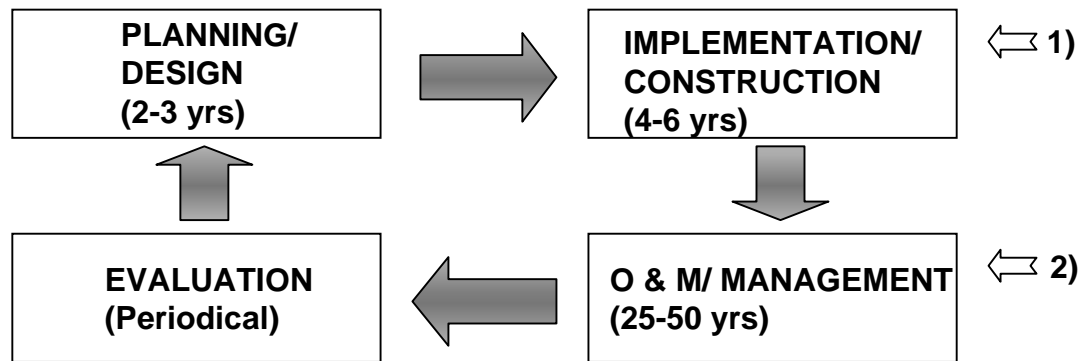
1. INDONESIA CONSISTS OF ABOUT **17,000 ISLANDS**. AND THE NUMBER OF RIVER ARE ABOUT **5,500 RIVERS**. THE MAJOR RIVERS ARE ABOUT **90 RIVERS**, INCLUDING THE BRANTAS RIVER BASIN
2. TECHNICAL DATA'S OF THE BRANTAS RIVER ARE AS FOLLOWS
  - . THE LENGTH OF THE RIVER IS ABOUT **320 KM**
  - . CATCHMENT AREA IS ABOUT **12,000 SQ KM**
  - . AVERAGE ANNUAL RAINFALL IS ABOUT **2,000 MM**
  - . AVERAGE ANNUAL RUN OFF IS ABOUT **12 BILLION M<sup>3</sup>**

## Page-2 INTEGRATED DEVELOPMENT OF THE BRANTAS RIVER BASIN



1. INTEGRATED DEVELOPMENT OF THE BRANTAS RIVER BASIN WAS STARTED IN 1961 THROUGH A SERIES OF MASTER PLANS. BASIC CONCEPT OF THE DEVELOPMENT WAS **“ONE RIVER, ONE PLAN, ONE COORDINATED MANAGEMENT”**
2. THE MAIN OBJECTIVE OF EACH MASTER PLAN WAS,
  - Ø MASTER PLAN I (1961) - FLOOD CONTROL
  - Ø MASTER PLAN II (1973) - IRRIGATION  
(SUPPORTED NATIONAL FOOD PRODUCTION)
  - Ø MASTER PLAN III (1985) - WATER SUPPLY  
(DRINKING WATER AND INDUSTRY )
  - Ø MASTER PLAN IV (1998) - WATER RESOURCES MANAGEMENT  
(O&M OF INFRASTRUCTURES )
3. THE RESULTS OF DEVELOPMENT WERE: FLOOD CONTROL (UP TO 50 YEAR RETURN PERIOD), IRRIGATION ( 345,000 HA ), ELECTRICITY (900 MILLION KWH/ YEAR ), RAW WATER FOR DRINKING WATER ( 200 MILLION M<sup>3</sup>/ YEAR ). RAW WATER FOR INDUSTRY (120 MILLION M<sup>3</sup>/ YEAR), RECREATION, FISHERY, ETC.

### Page-3 DEVELOPMENT CYCLE OF THE BRANTAS RIVER BASIN



1) Period of investment

2) Period to get benefits

1. DEVELOPMENT CYCLE CONSISTS OF : **PLANNING . IMPLEMENTATION . O&M (RIVER BASIN MANAGEMENT) . EVALUATION**. AS SHOWN IN THE ABOVE DIAGRAM. RIVER BASIN MANAGEMENT NEEDS A LONGEST PERIOD COMPARED TO THE OTHER ACTIVITIES. THE SUCCESSFUL OF DEVELOPMENT IS, WHEN ALL OF THE ACTIVITIES HAS BEEN IMPLEMENTED PROPERLY, OTHERWISE THE BENEFITS WILL REDUCE.
2. ON THE OTHERHAND, NOT MANY PEOPLE TAKES CARE TO THE WATER RESOURCES MANAGEMENT. MOST OF THE PROJECT MANAGERS ONLY THOUGHT ABOUT TARGET OF THE PROJECT AND PROMOTED A NEW PROJECT. PEOPLE DID NOT UNDERSTAND THAT THE BENEFITS OF THE PROJECT ARE ON THE CAPABILITY TO MANAGE THE FINISHED STUCTURES.
3. THE EXAMPLE IS LIKE THIS : THE HYDROPOWER PROJECT WAS DESIGNED TO PRODUCE ELECTRICITY AMOUNTS TO 600 MILLION KWH/ YEAR LIFE TIME 25 YEARS. BECAUSE OF POOR MANAGEMENT AND DEGRADATION OF ENVIRONMENT, AFTER 5 YEARS COMPLETION THE ENERGY PRODUCTION IS ONLY 300 MILLION KWH/ YEAR. THEN, THE QUESTION: **“BASED ON THIS NEW CONDITION, IS THE PROJECT FEASIBLE ?”**
4. IN PRACTICE, THERE ARE MANY CASES SIMILAR TO THE ABOVE EXAMPLE, AS A RESULT A LOT OF INVESTMENT DID NOT GET BENEFITS BUT THE SUFFER LOSS PROJECT.
5. THE PROBLEM WAS CAUSED BY LACK OF BUDGET FOR O&M, LACK OF MANAGEMENT SKILLS AND LACK OF INSTITUTION RESPONSIBLE TO MANAGE FINISHED STRUCTURES.
6. IN THE CASE OF THE BRANTAS RIVER BASIN, IN 1990 GOVERNMENT OF INDONESIA ESTABLISHED A CORPORATION (STATE OWN COMPANY), NAMELY JASA TIRTA PUBLIC CORPORATION. THE CORPORATION HAS AN AUTHORITY TO COLLECT MONEY FROM THE BENEFICIARIES AND TO USE IT TO COVER COST OF WATER RESOURCES MANAGEMENT IN THE RIVER BASIN.

## Page-4 WATER QUANTITY MANAGEMENT AND FLOOD CONTROL



1. IN ORDER TO CONTROL FLOODS MONITORING OF DISCHARGE WAS CONTROLLED BY EQUIPMENT CALLED FLOOD FORECASTING AND WARNING SYSTEM (FFWS), AS SHOWN IN THE PICTURE.
2. BASED ON EXPERIENCES IT WAS NEEDED INTEGRATED OPERATION BETWEEN TECHNICAL ASPECTS (PHYSICAL STRUCTURES) AND ADMINISTRATIVE ASPECTS (FLOOD FORECASTING, FLOOD WARNING AND FLOOD FIGHTING).
3. UP TO THE YEAR 2002, FLOODS IN THE BRANTAS RIVER CAN BE MANAGED PROPERLY.

## Page-5 IMPACT OF FLOOD CONTROL PROJECT

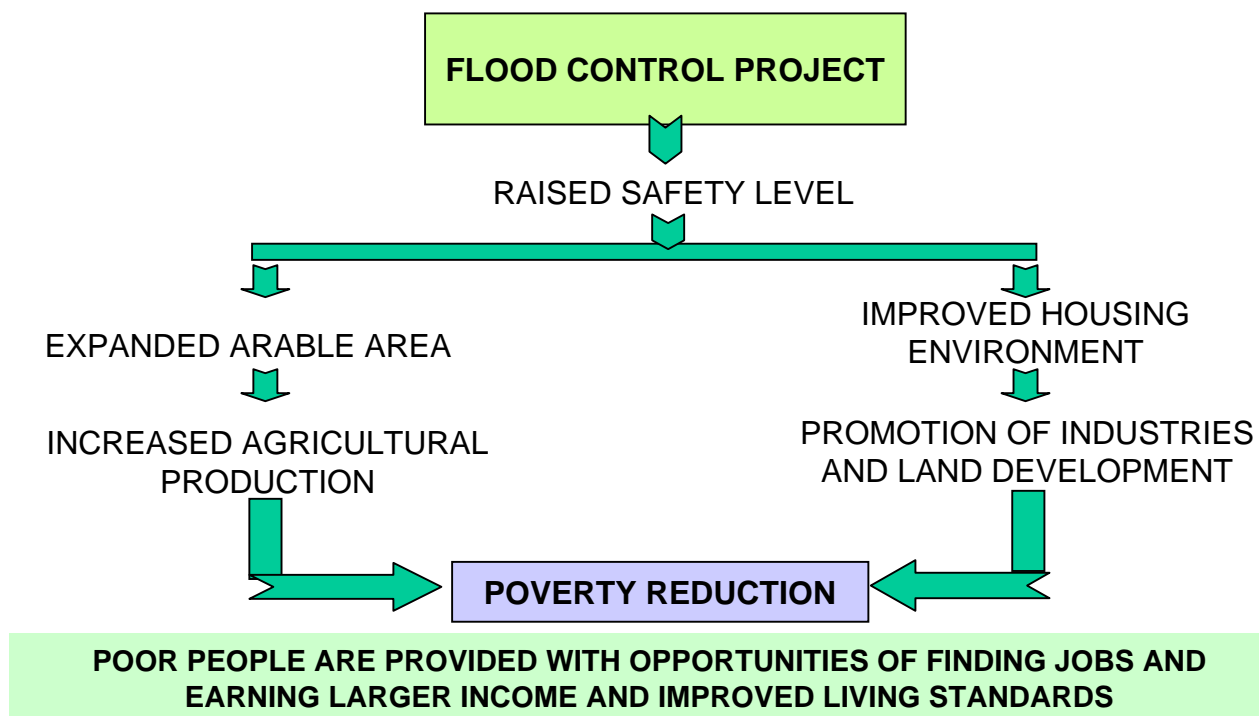


Table - Rice Production in the Brantas River Basin

(Unit-ton/ ha)

	1965	1970	1980	1990	1993	1999
All Indonesia	3.48	3.95	3.29	4.30	4.38	4.25
Brantas River Basin	3.69	4.55	4.62	5.43	5.67	5.22

FROM THE ABOVE DATAS IS SHOWN THAT RICE (PADDY) PRODUCTION IN THE BRANTAS RIVER BASIN WAS HIGHER THAN ALL INDONESIA IN ON AVERAGE.

## Page-6 ECONOMIC EVALUATION

Table - Performance of infrastructures in the Brantas river basin.

Year	1991	92	93	94	95	96	97	98	99	00
Irrigation (1.000 ha)	345	345	345	345	345	345	345	345	345	345
Electricity (1,000,000 kWh)	324	845	907	828	948	883	554	1023	1014	945
Drinking Water (1,000,000 m3)	20	138	124	128	144	152	177	199	207	205
Industrial Water (1,000,000 m3)	23	132	145	127	135	133	134	123	123	125
Flood Control	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)

\*) 50 year return period flood can be managed

1. ECONOMIC EVALUATION HAS TO BE DONE BEFORE AND AFTER CONSTRUCTION.. ECONOMIC LIFE TIME OF WATER RESOURCES INFRASTRUCTURES USUALLY ABOUT 25 TO 50 YEARS. DURING THIS PERIOD, THE OWNER HAS TO GET BENEFITS FROM THE STRUCTURES. ACCORDING TO THE EXPERIENCES IN INDONESIA, BENEFITS OF STRUCTURE DECREASES BEFORE AT THE END OF LIFE TIME IT MEANT THE PROJECT WAS LOSS. ESPECIALLY THE STRUCTURES EFFECTED BY ENVIRONMENTAL CONDITION, SUCH AS DAMS, RIVER CHANNELS, DRAINAGE CANALS, QUALITY OF WATER, ETC.
2. IN THE CASE OF THE BRANTAS RIVER BASIN, THE STATE OWN COMPANY RESPONSIBLES TO SUSTAIN BENEFITS OF THE STRUCTURES. ECONOMIC EVALUATION HAS BEEN DONE EVERY YEAR AS SHOWN IN THE TABLE ABOVE .THE FIGURES SHOWS THAT UP TO YEAR 2000, THE BENEFITS CAN BE SUSTAINED.

## Page-7 CONCLUSIONS

1. FLOOD MANAGEMENT ACTIVITIES IN THE BRANTAS RIVER CONSISTS OF TECHNICAL ASPECTS AND ADMINISTRATIF ASPECTS..

FLOOD CONTROL IS ONE OF THE MAIN OBJECTIVE OF THE BRANTAS RIVER BASIN DEVELOPMENT.

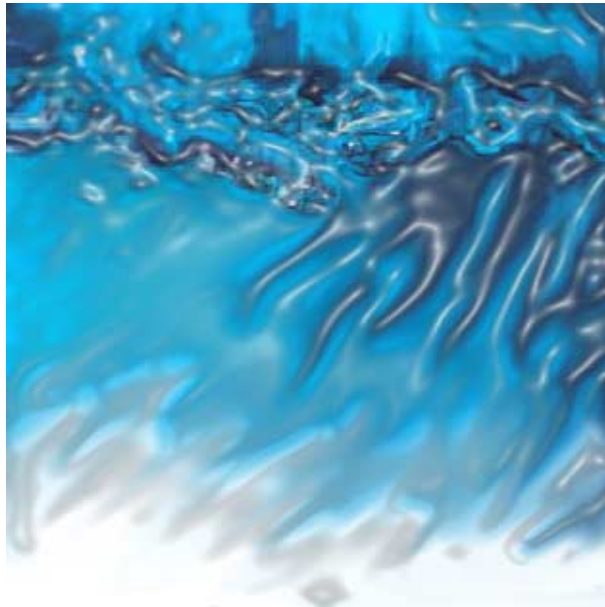
2. WATER RESOURCES DEVELOPMENT HAS TO BE DONE AS INTEGRATED MANNERS LOOKING FROM THE SPRING OF THE RIVER DOWN TO ESTUARY AS AN UNITY. THIS CONCEPT CALLED **“ONE RIVER, ONE PLAN, ONE COORDINATED MANAGEMENT”**, EVENTHOUGH FOR THE INTERNATIONAL RIVER. (THIS CONCEPT IS IN LINE WITH - UN CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURCES, NEW YORK, 21 MAY 1997).
3. O&M HAS AN IMPORTANT ROLE TO GET THE SUCCESS OF THE DEVELOPMENT. UNFORTUNATELY NOT MANY PEOPLE TAKE CARE TO THIS ACTIVITIES. AS A RESULT BENEFITS OF THE DEVELOPMENT TENDS TO DECREASE.
4. IN THE CASE OF THE BRANTAS RIVER BASIN, IN YEAR 1990, A STATE OWN COMPANY HAS ALREADY BEEN ESTABLISHED TO MANAGE THE BRANTAS RIVER BASIN AND HAS AN AUTHORITY TO COLLECT MONEY FROM THE BENEFICIARIES.
5. UP TO THE PRESENT, PERFORMANCE OF THE STRUCTURES CAN BE SUSTAINED.

**THANK YOU**

# Case Study-3, Flood Proofing and Livelihood Development in Bangladesh

**Md. Zahangir Alam**

*Project Director,  
Local Government Engineering Department,  
Bangladesh*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# PRESENTATION ON FLOOD PROOFING AND LIVELIHOOD DEVELOPMENT IN BANGLADESH

Md. Zahangir Alam  
Project Director  
Local Government Engineering Department.  
Bangladesh

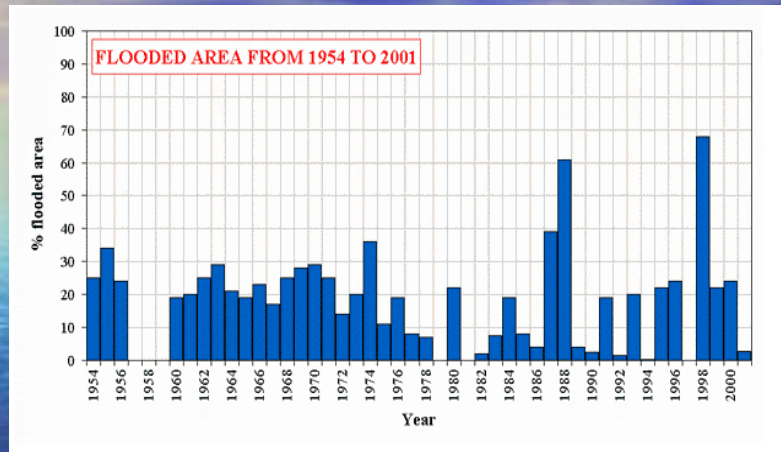
The 3<sup>rd</sup> World Water Forum  
March 16-23, 2003, Japan

## GEOGRAPHICAL LOCATION

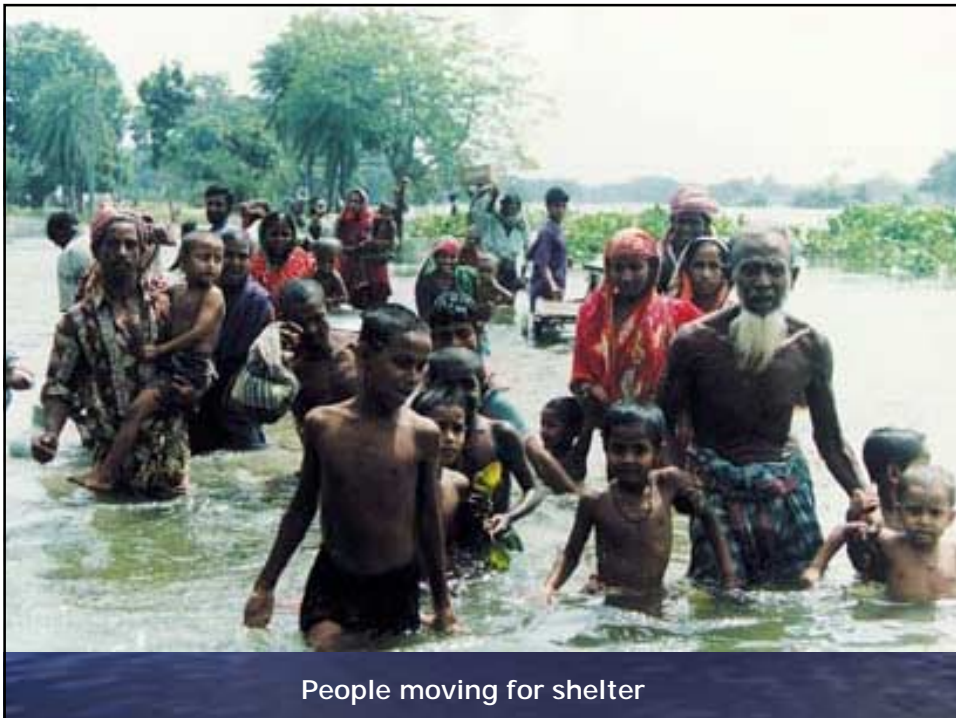


- The country is bordered by India on the west, north and the northeast, Myanmar on the southeast and the Bay of Bengal on the south.
- It has a landmass of 148,393 sq. km.

## Overview of Flood in Bangladesh



Floods are a recurrent phenomenon in Bangladesh. Nearly 20 percent of its area is inundated even in a year of normal precipitation. About two-thirds of the country could be affected in a year of severe flooding.

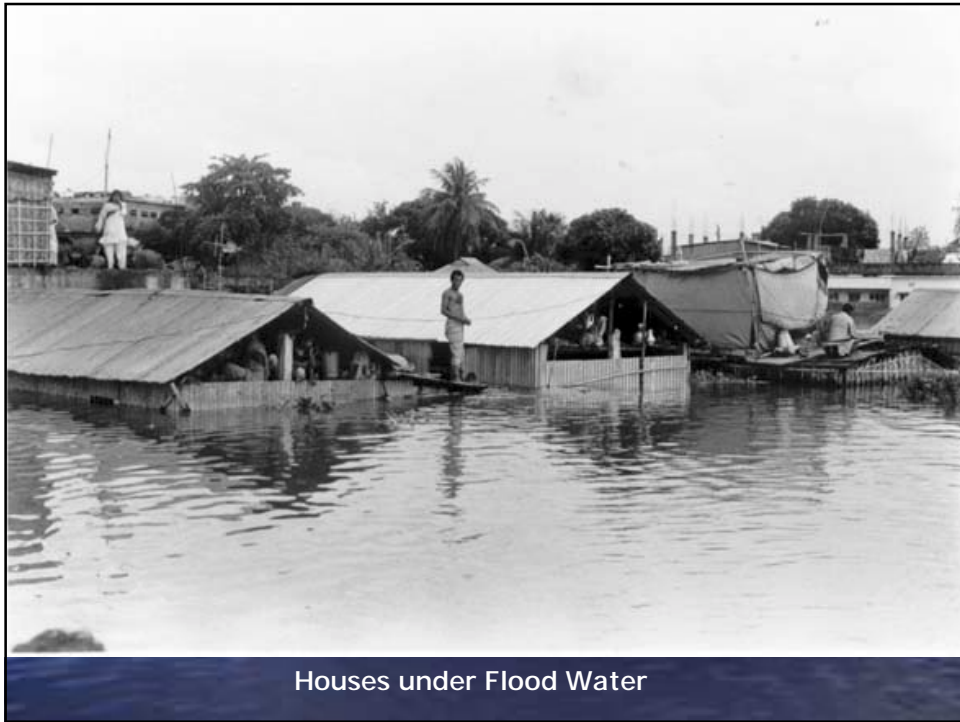




Mother crossing the road  
with her child.



Railway Track Inundated



Houses under Flood Water



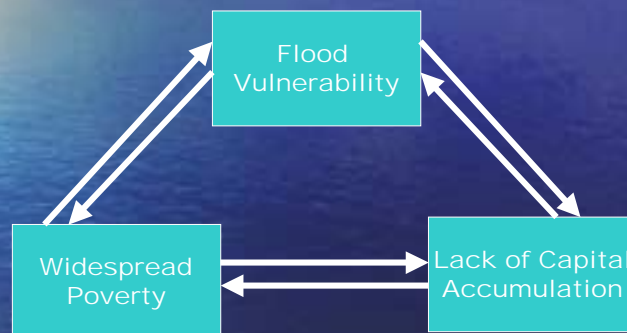
Road Communication Disrupted

## RELATION BETWEEN FLOODS & PROVERTY

- ❖ Agriculture related activities ( Farmer, Share-cropper & Agri-labour ) are the main occupation in the rural Bangladesh. But during flood these people lose their income source due to submergence of farm land which makes them more poorer.
- ❖ The widespread poverty issue is a direct outcome of insufficient opportunities for income generation, low level of economic activities & productivity and large health expenditure.
- ❖ The widespread poverty is the only barrier for capital accumulation and livelihood development.
- ❖ The lack of capital accumulation, of course, is the major causing for vulnerability to flood.

## VICIOUS CYCLE

The rural development in Bangladesh is seriously hindered by the vicious cycle, exists between the widespread poverty, lack of capital accumulation and flood vulnerability.



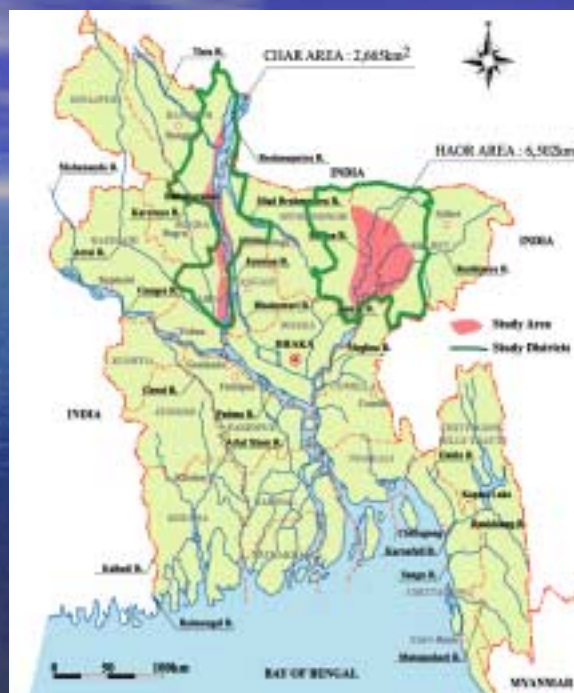
## JICA ASSISTED STUDY ON RURAL DEVELOPMENT FOCUSING ON FLOOD PROOFING

Implementing Agency : LGED

Study Duration : December 2000 to June 2002

Study Area : Char Areas of Four Districts (Gaibandha,  
Kurigram, Sirajgonj, Jamalpur)  
Haor Areas of Four Districts (Kishoregonj,  
Netrokona, Hobigonj, Sunamgonj)

### STUDY AREA



## OBJECTIVE OR GOAL OF RURAL DEVELOPMENT IN FLOOD PRONE AREAS

For implementing a support of Livelihood Development, an improvement of Living Environment and a Small Scale Flood Disaster Mitigation, 4 Specific Objectives or Goals are fixed up :

- ❖ To protect human lives and properties from severe flood.
- ❖ To facilitate the improvement of living environment with Flood Proofing.
- ❖ To support the livelihood development by providing training, education and other services together with Flood Proofing.
- ❖ Enhancement of people's capacity to make decisions on their own for development projects through their active participation.

## Problem Identified by Study Team

**The JICA Study Team identified the following problem structures in the Flood Prone Areas:**

- Lack of Livelihood
- Poor Social & Living Environment
- Chronic Flood Disaster

**Based on the Study, following components are recommended for comprehensive Rural Development :**

- A Support of Livelihood Development
- An Improvement of Living Environment
- A Small Scale Flood Disaster Mitigation in combination with structural and non-structural approach

## **DEVELOPMENT PLAN FOR MODEL PROJECTS**

### **Algar Char Gram : ( Char Area)**

#### **1. Flood Proofing and Improvement of Living Environment**

- a. Homestead Rising (61 houses)
- b. Raising of school ground as sheltering place (4500 m<sup>2</sup>)
- c. Raising of hand tubewells (five units) and new construction (one unit)
- d. Flood Warning and Evacuation system establishment

#### **2. Support Service for Livelihood Development**

- a. Home gardening promotion with nutrition education
- b. Poultry promotion
- c. Skill training on hand weaving
- d. Mulberry plantation and cocoon production (long-term vision)

#### **3. Savings and Credit Scheme :**

- a. Compulsory savings
- b. Surcharges or user fees
- c. Insurance and loan

## **Gurai Gram ( Haor Area)**

### **1. Flood Proofing and Improvement of Living Environment**

- a. Wave protection (brick masonry retaining wall 1756 m length and 2.75 m height.
- b. Raising hand tubewells (27 units) and new construction (19 units)
- c. Flood Warning and Evacuation System established

### **2. Support Service for Livelihood Development**

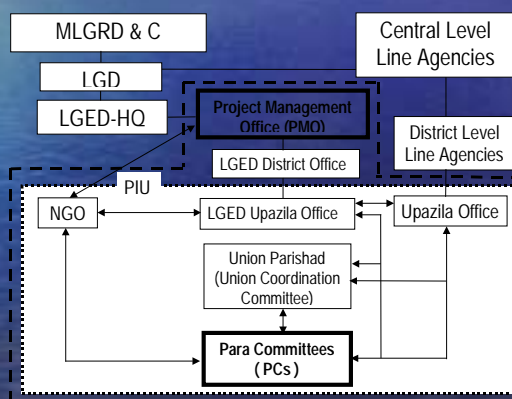
- a. Home gardening promotion with nutrition education
- b. Poultry (duck) promotion
- c. Fish Culture promotion
- d. Nursery development for social forestry
- e. Entrepreneurship development for paraboiling plant operation.

### **3. Saving and Credit Scheme :**

- a. Compulsory savings
- b. Surcharges or user fees
- c. Insurance and loan

## IMPLEMENTATION ARRANGEMENT

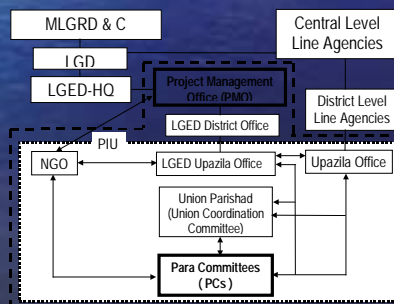
For ensuring the coordinated implementation of the project, the Study Team recommended to establish a Project Management Office (PMO) in LGED HQ in Dhaka.



## IMPLEMENTATION ARRANGEMENT

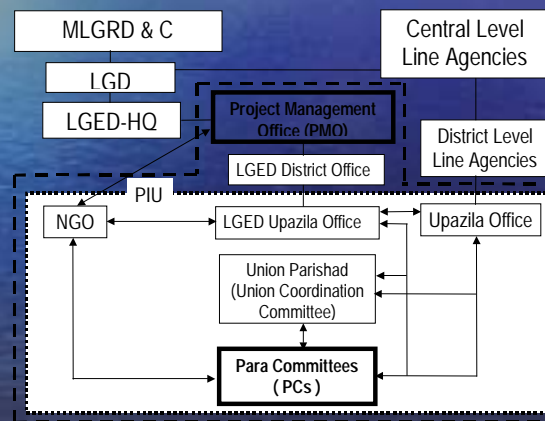
Under close guidance and supervision of PMO, the LGED district offices in the project areas will be responsible for day-to-day activities with assistance from LGED upazila(sub-district) offices.

The LGED upazila office, in cooperation with NGO facilitator, would assist local people to establish Para Committee consists of the representative of the small village areas.



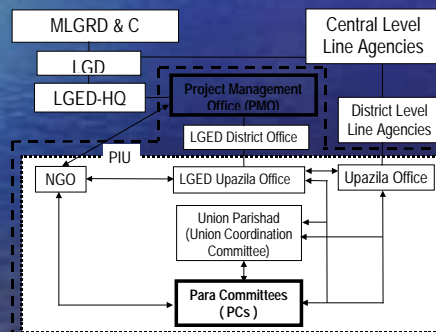
## IMPLEMENTATION ARRANGEMENT

To provide technical support and guidance, a Project Implementation Unit (PIU) will be established at the Upazila level. PIU will be composed of the LGED Upazila Office, Upazila Administration, Other Upazila level Government Offices, Union Parishad, Para Committee and NGOs.



## IMPLEMENTATION ARRANGEMENT

Para Committee (PC) will be responsible for operation & maintenance (O&M) arrangements for structural flood control measures, flood warning and evacuation system, livelihood projects and cost sharing in cash & in kind for construction works and the establishment of the saving and credit schemes.



FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Homestead Rising by Earthwork

FEW ACTIVITIES OF US\_AID  
SUPPORTED FLOOD PROOFING  
PROJECT



Reconstructing the  
House after Platform  
Raising

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Slope Protection by CC Block in Haor Area

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Flood Shelter Cum Primary School

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Home Gardening

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Home Gardening in the Slope

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Raised Latrine

FEW ACTIVITIES OF US\_AID SUPPORTED FLOOD PROOFING PROJECT



Training Program on Health Care

## Conclusion :

The people living in the flood prone areas suffers a lot every year and their economic and social development is hindered seriously due to the losses causes by flood. But adequate intervention for flood mitigation yet not been there.

Government, NGOs and Development Partners may come forward with more support to stand beside those distress people.

LGED has taken up two flood proofing model projects (one in char and other in haor) with the assistance from JICA. With the experiences of those model projects, LGED has intention to implement a complete flood proofing and livelihood supporting project for the entire areas to mitigate flood disaster and poverty.

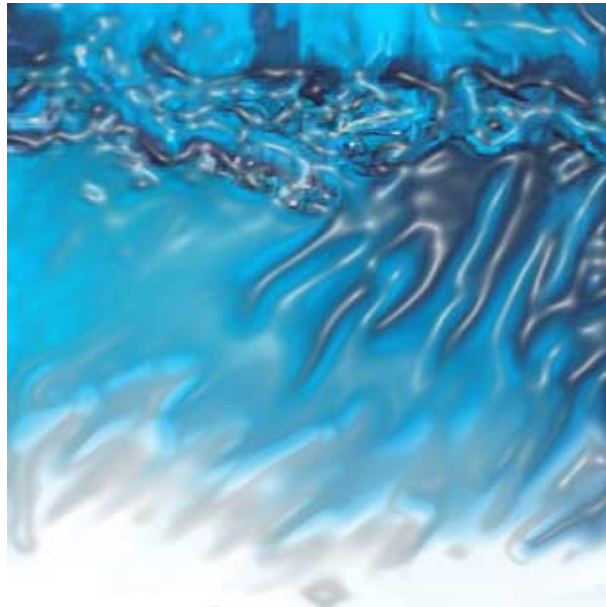
We believe that this type of program of flood proofing and livelihood supporting will be very much effective to cut off the vicious cycle between the widespread poverty, lack of capital accumulation and flood vulnerability in other developing countries.



# Case Study-4, Lessons Learned From Operation of Flood Detention Basins in China

**Dr. Huang Jinchi**

*Flood and Drought Disaster Mitigation Research Center  
Ministry of Water Resources  
Peoples Republic of China*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**



## Lessons Learned From Operation of Flood Detention Basins in China

**Dr. Huang Jinchi**

*Flood and Drought Disaster  
Mitigation Research Center  
Ministry of Water Resources  
Peoples Republic of China*

### Typical flood detention areas of China

River	Number of Basins	Total Area (km <sup>2</sup> )	Farmland (million ha)	Population (million persons)	Storage capacity (million m <sup>3</sup> )
Yangtze	40	11,866	0.55	5.69	63.7
Yellow	6	9,169	0.61	4.71	7.8
Huaihe	27	3,912	0.24	1.62	8.6
Haihe	25	9,560	0.57	4.14	17.0
Total	98	34,507	1.96	1.62	97.1

**Diversion discharges of  
key flood detention basins  
indicate their significant  
role in flood control**

**Diversion discharge of key  
flood detention basins**

<b>River</b>	<b>Discharge in river (m<sup>3</sup>/sec) (1)</b>	<b>Diversion discharge (m<sup>3</sup>/sec) (2)</b>	<b>Ratio (%) (2)/(1)</b>
Beijindi, Yellow	22,300–30,000	7,500–10,000	34
Jingjiang, Yangtze	80,000	20,000	25
Dujiatai, Hanjiang	18,400	4,000	22
Mengwa, Huaihe	5,000	1,620	32
Xiaoqinghe, Yongding	4,000	1,500	38

## 7 major river basins of China



## Water disasters and poverty in flood detention basins



Frequent flood inundation



Environmental degradation



Increasing population

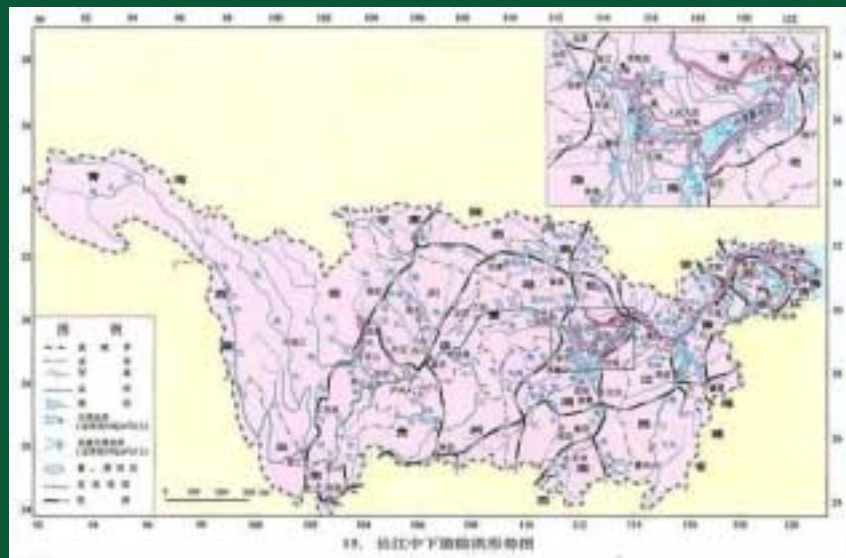


Inadequate economic development

# Flood Retarding Areas

# Yangtze River Basin

The map displays the Yangtze River Basin, a major river system in China. The river originates in the west and flows eastward, eventually emptying into the East China Sea. The basin covers a vast area, including several provinces. The map features a legend with symbols for various geographical features, such as rivers, lakes, and urban areas. A scale bar is provided at the bottom left, indicating distances in kilometers. An inset map in the top right corner shows a detailed view of the river's lower reaches and the surrounding urban areas.



# Yellow River Basin



Flood detention areas → 5  
but only 1 has ever been  
used (Dongpinghu Lake)

Population → 1.7 million;  
evacuation will be needed

1982 operation →  
maximum discharge at  
Huayuankou station was  
15,300 m<sup>3</sup>/sec

# Huaihe River Basin

- Flood retarding basins → 27
- Total storage capacity → over 17 billion m<sup>3</sup>
- Population → 4.9 million
- Affected area → over 9,560 km<sup>2</sup>



## Haihe River Basin

Flood retarding areas

→ 25

Total storage capacity

→ over 17 billion m<sup>3</sup>

Population

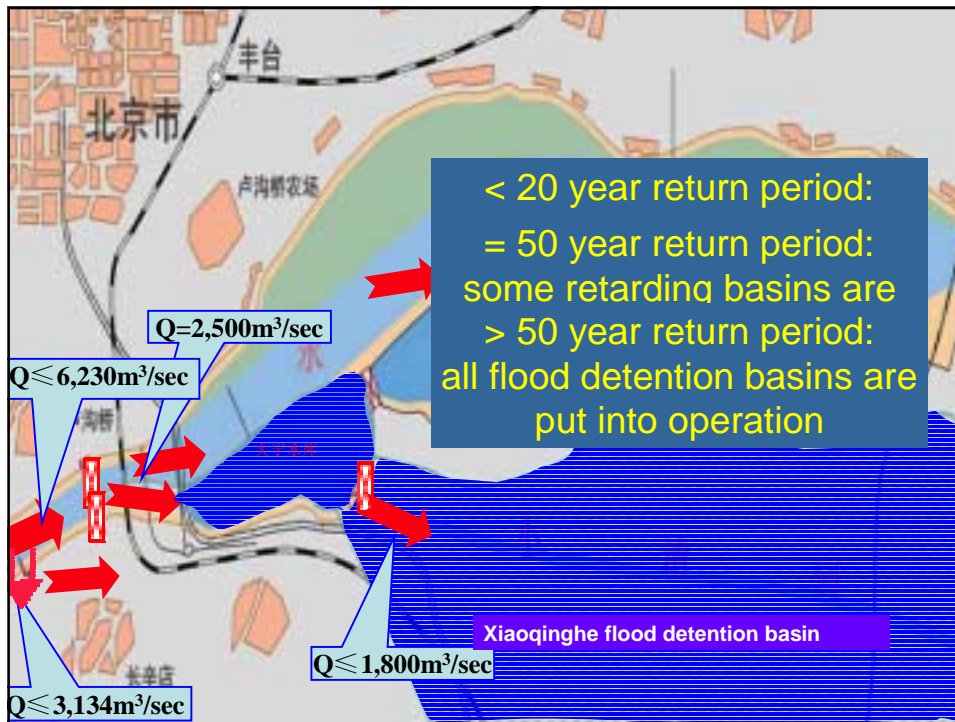
→ 4.9 million

Affected area

→ over 9,560 km<sup>2</sup>



**Careful planning is  
essential for detention  
basin operation**



## Required safety facilities

### Haihe River Basin example

- over 2,320,000 m<sup>2</sup> of flooded area
- 310,000 m<sup>2</sup> of safe houses
- 751km of evacuation roads
- 23% of population in flood detention basins guaranteed safety



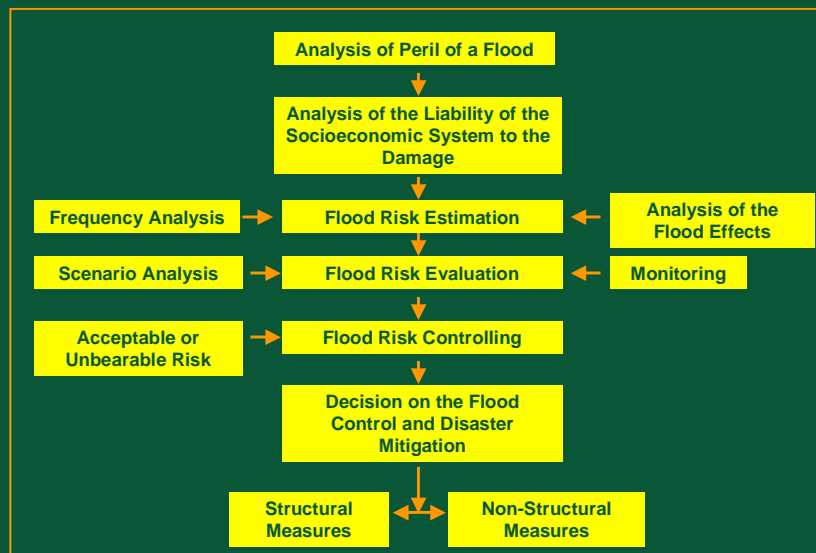
Safe area

## Flood early warning capacity

- Numerical modeling
- Information network
- Testing and verification
- Training for warning decision makers
- Warning announcements



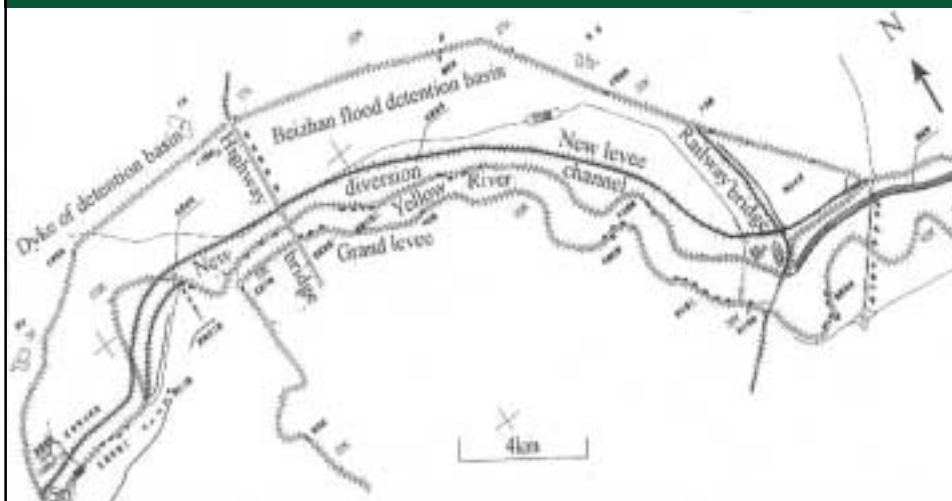
## Post-flood recovery and flood insurance program



## Post-flood recovery and flood insurance program

- **Insurance** is a water disaster risk sharing strategy for the entire community
- **Fundamentals of water disaster insurance**  
*“A successful water disaster insurance system must build a mechanism to encourage local stakeholders, including administrative agencies and the private sector, to take all measures necessary to reduce water disaster damage as much as possible”*

## Combining flood diversion and flood detention to reduce impacts



The decision to flood or not to flood detention basins has political and social impacts

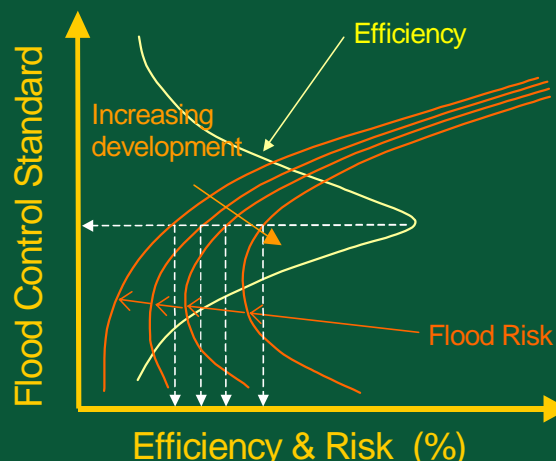
## Changing land use mode can provide permanent benefits

- Partial flood detention during extreme flood events
- Waste water treatment using new technologies
- Permanent change in land use mode



## Need for appropriate flood control strategy

- Careful decision making
- Evaluating all flood risks



## **Management of flood detention areas is complex**

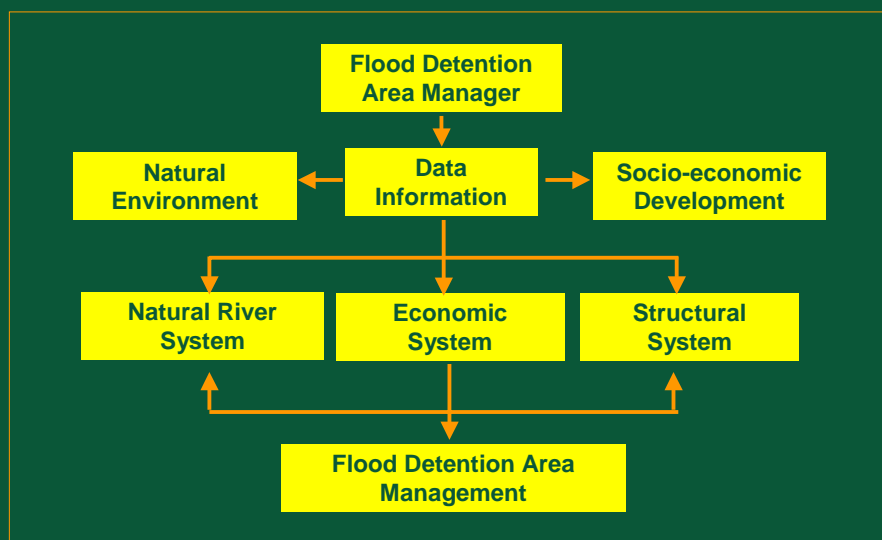
- different management aspects have to be considered together
- management of multiple objectives is required
- river system cannot fulfill all of its functions all of the time; or even at the same time





- the physical, chemical and biological processes in a river system are complex
- many competing management measures are available
- coordination between agencies and affected population is essential

## Principles of flood detention basin management



## Conclusion

Efficient multi-stakeholder management and use of flood detention basins are traditional flood coping mechanisms that are being revived in China

**The challenges are daunting.  
The rewards will be impressive.**

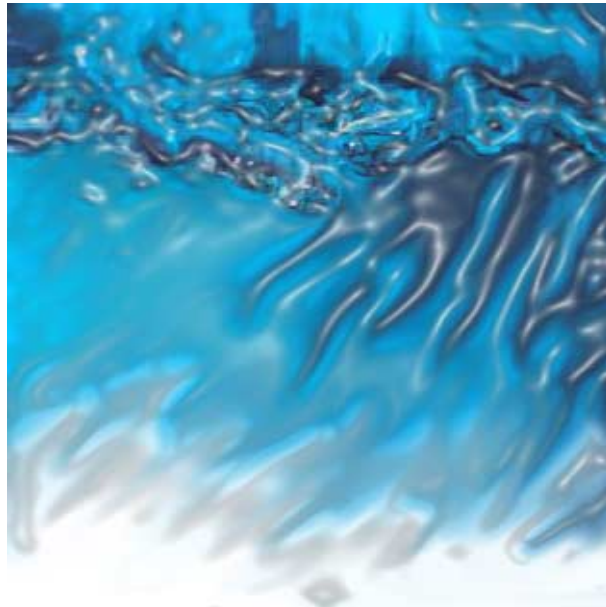
# Case Study-5, Living with Floods in the Mekong River Delta of Viet Nam

**Dang Quang Tinh**

*Central Committee for Flood and Storm Control*

**Pham Thanh Hang**

*United Nations Development Programme-Viet Nam*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**



## Living with Floods in Viet Nam's Mekong River Delta

**Dang Quang Tinh**

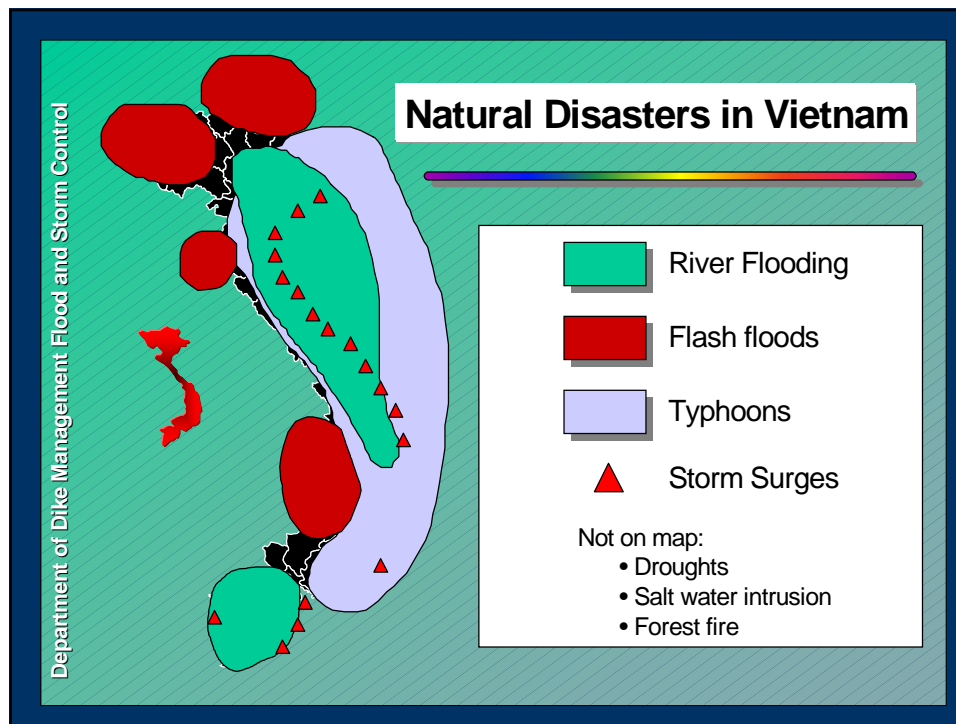
*Central Committee for Flood and Storm Control*

**Pham Thanh Hang**

*United Nations Development Programme-Viet Nam*

## About the Mekong River Delta of Viet Nam

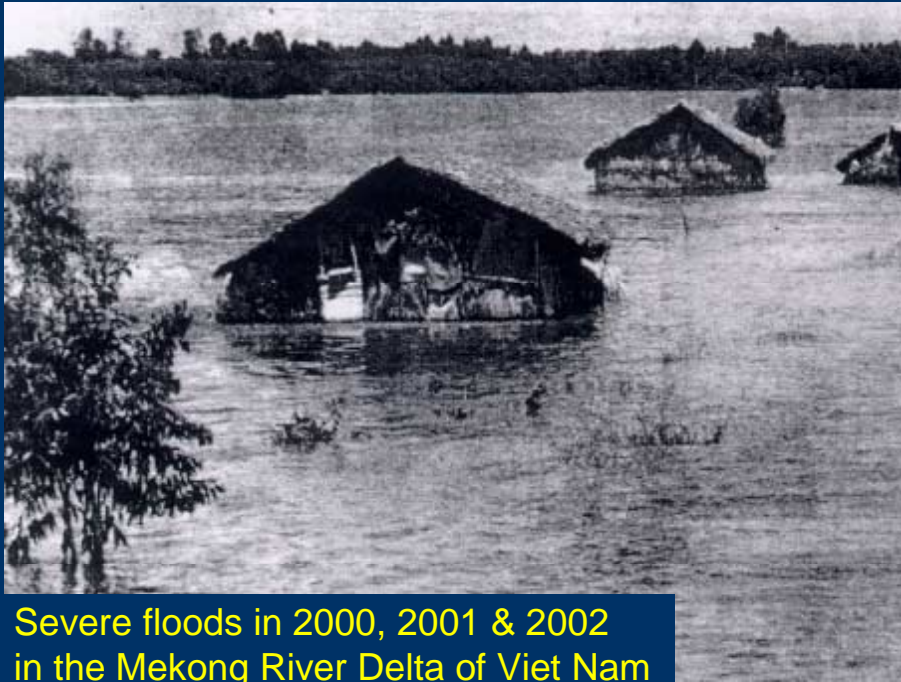
- Land: 4 million ha
- Cultivated land: approx. 3 million ha
- Population: 16 million
- Supplies more than 50% of staple food and 60% of fish production for entire nation
- Accounts for 27% of total Viet Nam's GDP



## People's Perception of Floods



- Floods are a natural feature
- Floods have both positive and negative impacts
- People do not consider floods; per se, as disasters. It is a disaster when there is no flood, or an early or a big flood.



## “Living with Floods” Concept

- To “co-exist” with floods to maximize benefits and mitigate negative impacts
- Practiced by people for years through different coping mechanisms
- Government’s main strategy for disaster mitigation in the Mekong River Delta of Viet Nam since late 1990s





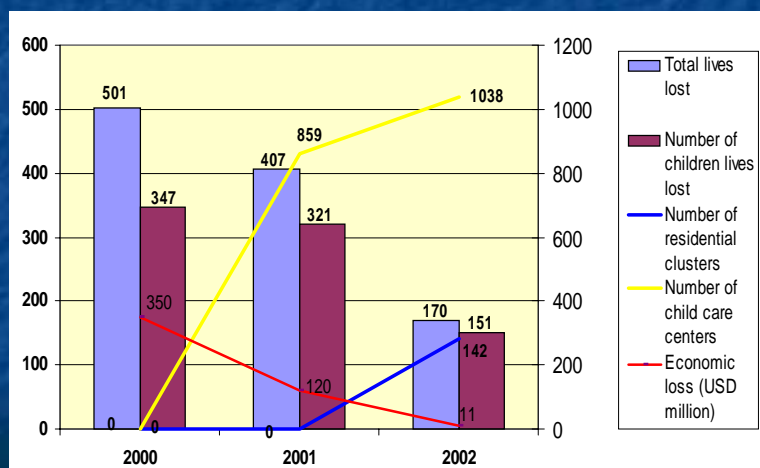
AOnh: Quang Tri, 2001

Model of school on stilts

## Government Measures for Living with Floods

- Building residential clusters
- Building flood proof housing
- Building dykes and boundary embankment
- Shifting of crop calendar
- Improving flood release capacity
- Establishing child care centers
- Conducting child safety training

## Initial Progress



## Lessons Learned

- Quality of infrastructure investment
- Need for social and environmental facilities
- Awareness raising and participation of people are essential
- Targeting the poorest of the poor
- Integrated and coordinated planning in Lower Mekong Basin is crucial
- Child care center model as a cost-effective and non-structural measure

## Floods and Poverty



- Flood disasters increase poverty and vulnerability of the poor
- Floods disasters set back hard won development efforts; And
- Floods do challenge the progress toward achieving the Millenium Development Goals (MDGs).

## Floods Challenge the MDGs

- Flood disasters cause poverty and slow poverty reduction rate in the Mekong Delta
- Floods contribute to low literacy and net enrollment rates, particularly among girls
- Extremely low rate of access to clean water
- Water-borne diseases & limited access to health care
- Increased migration and vulnerability to HIV/AIDS
- Poor women suffer the most during floods



## New Initiatives for “Living with Floods”

- ICT for early warning and information sharing  
[www.undp.org.vn/dmu](http://www.undp.org.vn/dmu)
- Establishment of a self-reliant disaster fund
  - UN-NGOs joint disaster assessment to capture social and ecological impacts
  - Sound methodology to calculate economic loss and coping mechanisms by the people – the basis for involving insurance companies
  - Importance of Pro-poor policies and programs in Disaster reduction
- Application of disaster-resistant building codes

## How to Move Forward

- Foster inter agency collaboration of National actors
- Use the Natural Disaster Mitigation Partnership (NDM-Partnership) to build partnership among Government, Donors and NGOs

[www.undp.org.vn/dmu/ndm-partnership](http://www.undp.org.vn/dmu/ndm-partnership)

- Collaboration with BP, Microsoft and Price Waterhouse Cooper as an example of public-private partnership for human safety and well-being and corporate social responsibility

Thank You

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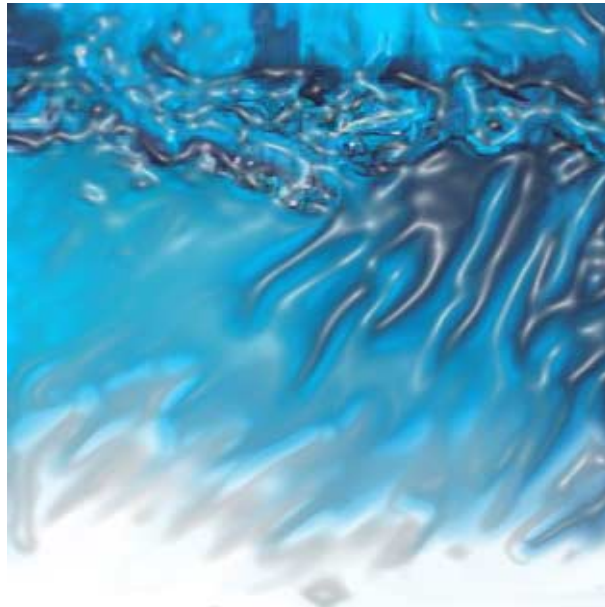
### **(3) PANEL DISCUSSION**

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Panel Discussion, Chairman

**Mr. Hidetomi OI**

*Senior Advisor,  
Institute for International Cooperation, JICA,  
Japan*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

## Session: “POVERTY AND FLOODS” in the Cross-Cutting Issue of “Floods”

### General Discussion

1

### Key Issues

- ◆ Millions of people have been suffering from floods every year by loss of lives, properties, means of life, and access to vital infrastructure and services. These adverse impacts affect the poorest segments of the society most severely .
- ◆ The vulnerability has been progressing as a result of the vicious cycle of population growth, destitution, environmental deterioration and the increase in population especially the poor at high-risk areas.
- ◆ The lack of capacity to limit the impact of floods remains a major burden for developing countries mainly due to limited resources while there are many pressing issues in various sectors.
- ◆ Thus, despite of achievements made so far, flooding has been increasing in terms of frequency and damage as the vulnerability progresses, aggravating the poverty situation and hampering the social and economic development of communities/regions/countries.

2

### Actions and Recommendations (1/2)

- ◆ In the selection of projects, priority should be placed on projects, which will contribute more to poverty alleviation, by including “poverty alleviation” in the criteria for project selection.
- ◆ In the decision-making process of projects, opinions of the poor should be appropriately reflected, so as to minimize the adverse impact and to maximize the beneficial impact of the projects for the poor.
- ◆ Likewise, in the design of projects, livelihood improvement, job creation and other pro-poor elements should be considered, in order for the poor to benefit from the projects as much as possible.
- ◆ Different approaches should be adopted according to the conditions of flood prone areas: a high standard protection for urban and other highly populated developed areas; and relatively limited protection by flood proofing etc. for other areas, maximizing beneficial impact of floods.

3

### Actions and Recommendations (2/2)

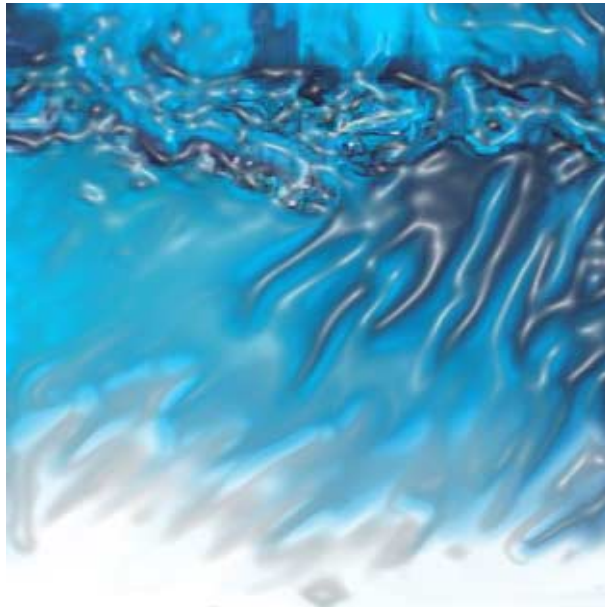
- ◆ The advantage of traditional means of coping with frequent, low-intensity floods developed by communities should also be considered.
- ◆ Flood vulnerability analysis should be the starting point of preparation and operation for flood mitigation and management plan.
- ◆ In view of the ever increasing vulnerability to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to local conditions.

4

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## **(4) COMMENTS OF PANELIST**

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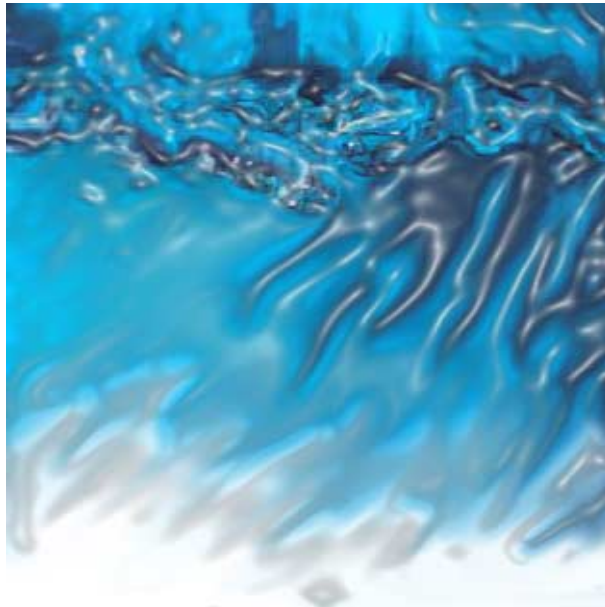


**THE SECONDARY WATER RESOURCES PROJECT STUDY**

## Panel Discussion, Panel Member-1

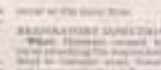
**Shun-ichi Maeda**

*JICA Expert for Water Resources Policy,  
The Ministry of Land, Infrastructure and Transport (MLIT)  
Japan*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

## MAEDA Shunichi



A map of the Danube River basin, showing the river's course from the Alps in the west to the Black Sea in the east. Major cities like Vienna, Budapest, and Belgrade are marked. The map also shows the river's tributaries and the surrounding geographical features.



## Tulungagung Prefecture Ngrowo River Basin



## Change in the Land Use

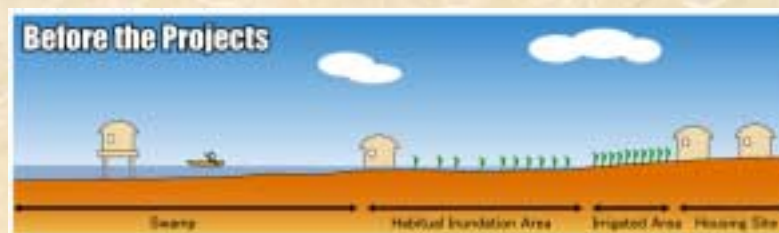


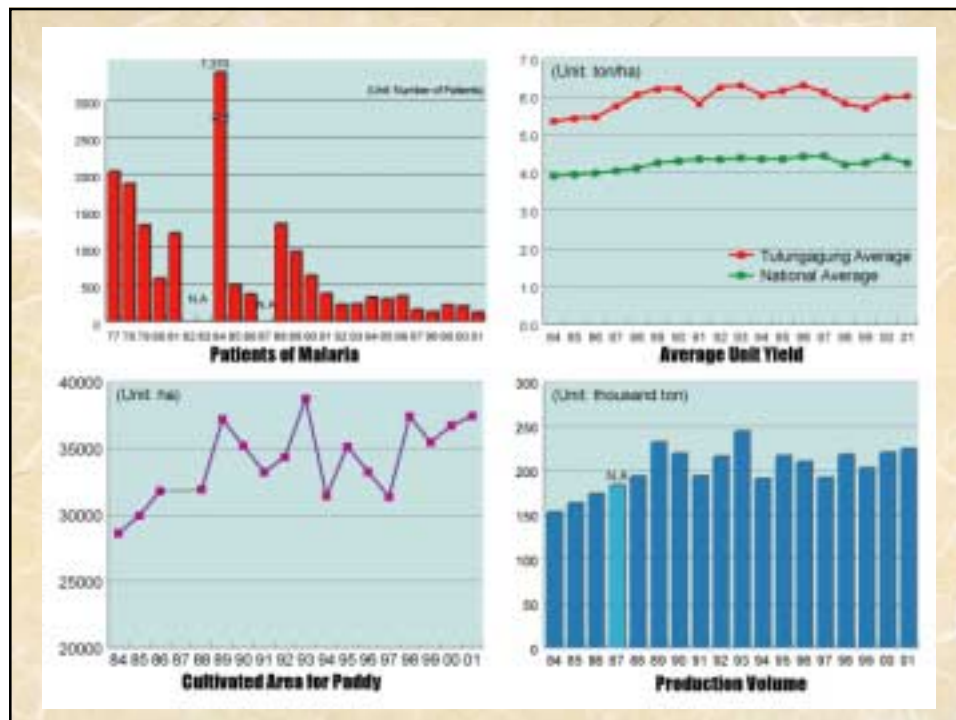
**Bening Swamp  
(Before the Projects: 1959)**

**Fertile Paddy Field  
(After the Projects: 2002)**

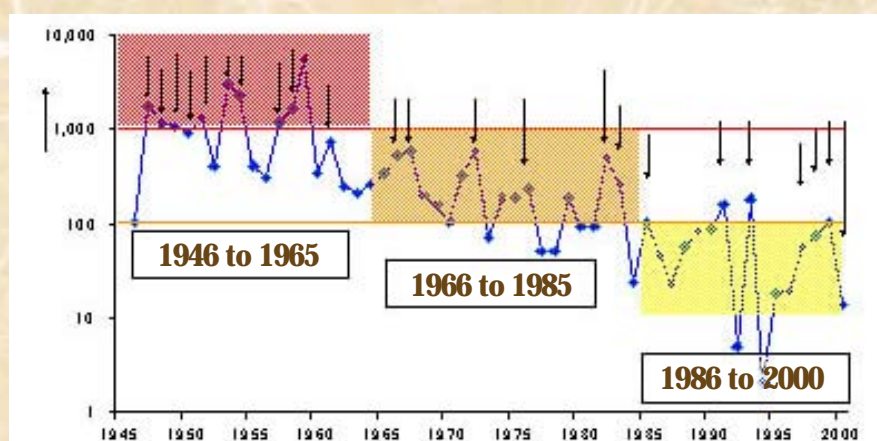


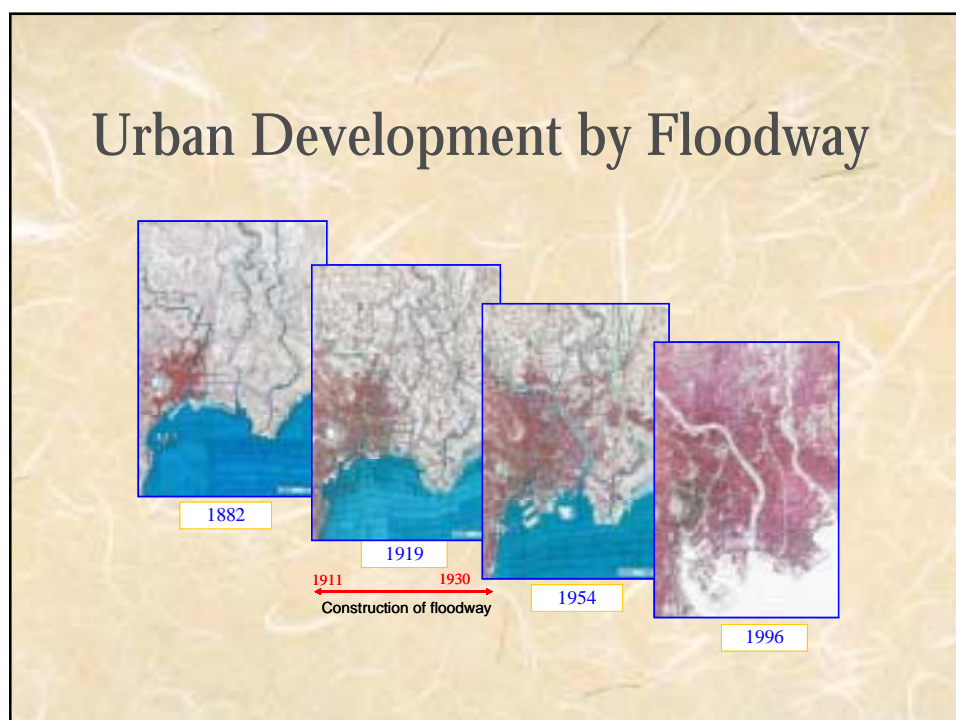
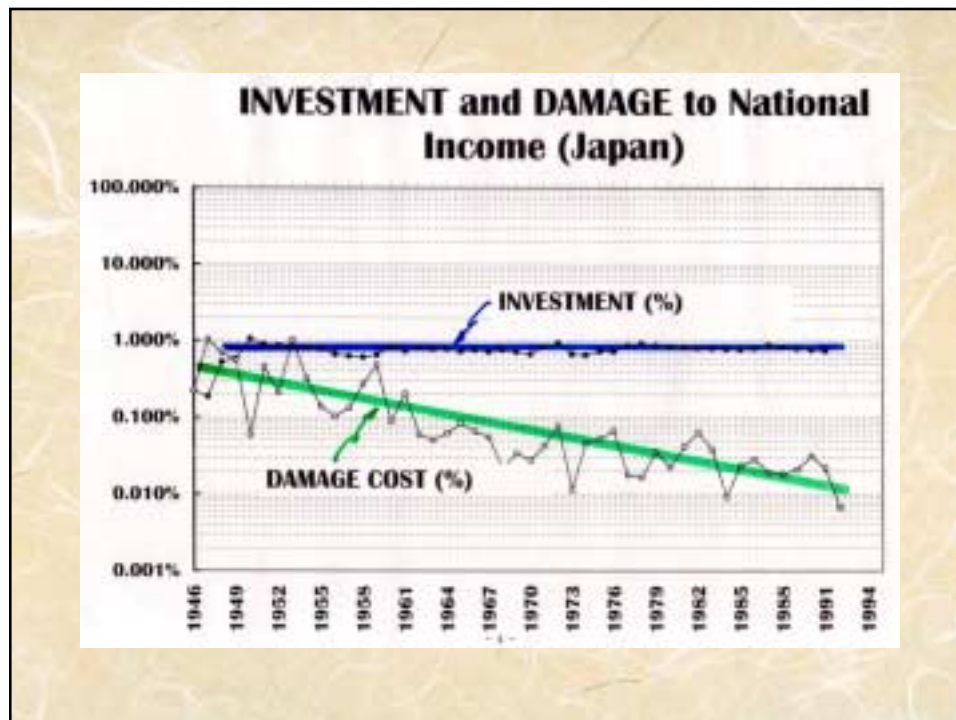
## Change in the Land Use



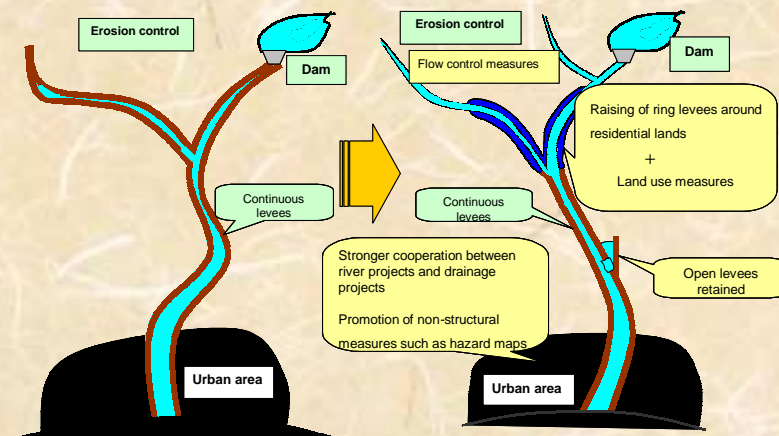


## Decrease the Number of Fatalities





## Comprehensive Flood Control Concept



## Conclusion

- The flood, as the most damaging natural disaster, is an important problem to be solved to ensure sustainable development and poverty alleviation.
- Well-planned and continuous flood control contributes to regional development and poverty alleviation.
- Appropriately selecting and combining measures (structural and non-structural measures) in accordance with environmental/social conditions in each basin is essential.
- It is necessary to make clear the effect of the projects regarding poverty alleviation including baseline data collection.

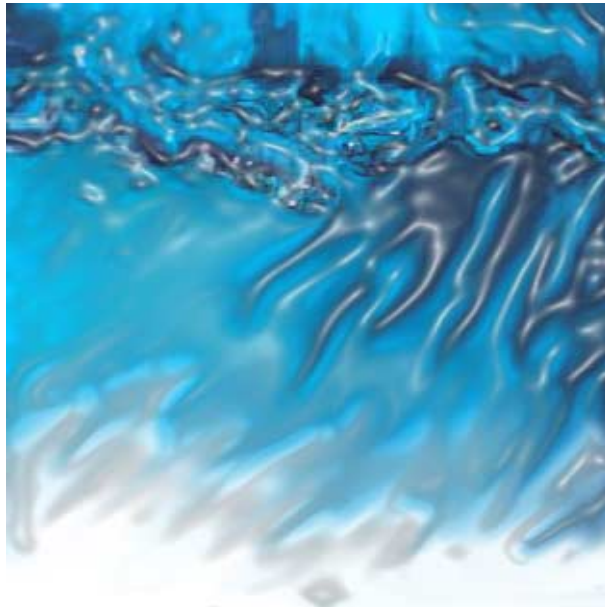
## Panel Discussion, Panel Member-2

**Senichi Kimura**

*Director*

*Japan International Cooperation Agency (JICA)*

*Japan*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# Message from JICA on Poverty and Floods

Senichi Kimura

Director of 2nd Social Development Study Division  
Social Development Study Department  
Japan International Cooperation Agency (JICA)

## Consideration for the Socially Vulnerable, the Poor, and Gender Issues

1. To prioritize projects which aim at poverty reduction in project screening process
2. To understand the situation of the socially vulnerable, the poor, and gender issues (social analysis) prior to project delivery
3. To promote the participation of the socially vulnerable, the poor, and women in decision making and contributing to improvements in their social status
4. To contribute to improving the lives of the socially vulnerable, the poor, and women
5. To employ technologies taking into account the socially vulnerable, the poor, and women

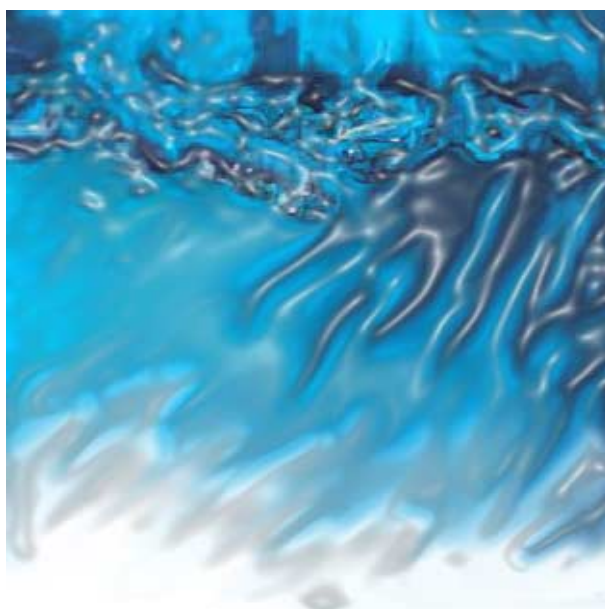
### More Pro-poor Approach

1. To prioritize of projects, which aim at poverty reduction in project screening process
2. To promote more participation of the poor in decision making, from project formulation to project implementation
3. To promote projects in order that the poor can get maximum benefit

## Panel Discussion, Panel Member-3

**Ian B. Fox**

*Principal Project Specialist  
Asian Development Bank (ADB)  
Philippines*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# Reducing the Vulnerability of the Poor to the Negative Impacts of Floods

Ian B. Fox  
Principal Project Specialist  
Asian Development Bank

ADB



## Floods: what we know

- mostly caused by natural phenomena
- recurrent, widely varying in severity, and largely unpredictable
- only disastrous when people and property are in the way

ADB

## Engineering approach falls short

Flood control projects encourage further investment and development in flood-prone areas, requiring even larger control works

ADB

## Crisis management...



When flood control structures are the primary line of defense, flood management becomes crisis management.

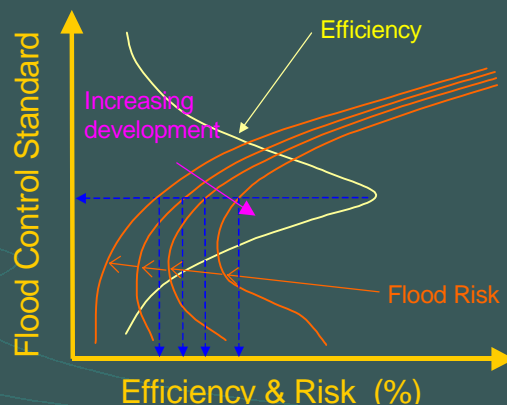


Songhua River, 1998

ADB

## Adopting an appropriate flood control standard

- **Appropriate flood control standard gives optimum economic efficiency while balancing flood risk against flood magnitude.**
- **Flood risk includes the combined effects of:**
  - *Design and construction risks*
  - *Flood inundation risk*
  - *Structural failure risk*
  - *Other risks*



ADB

## Who suffers most

1. Poor people in cities and rural areas living near rivers and in floodplains	<ul style="list-style-type: none"> <li>• Lives lost, people injured</li> <li>• Homes, possessions, crops, livestock, and other means of livelihood lost</li> <li>• Water-borne diseases spread</li> </ul>
2. People living in coastal areas prone to surges	
3. Owners of large commercial interests in floodplains	<ul style="list-style-type: none"> <li>• Businesses disrupted</li> <li>• Jobs and incomes lost</li> </ul>
4. Regional and national economy	

## Living with floods...



In the flood corridor of China's Yellow River, villages are being relocated on raised platforms



## Live with floods...

Maximize the beneficial impacts of floods and conserve wetlands.



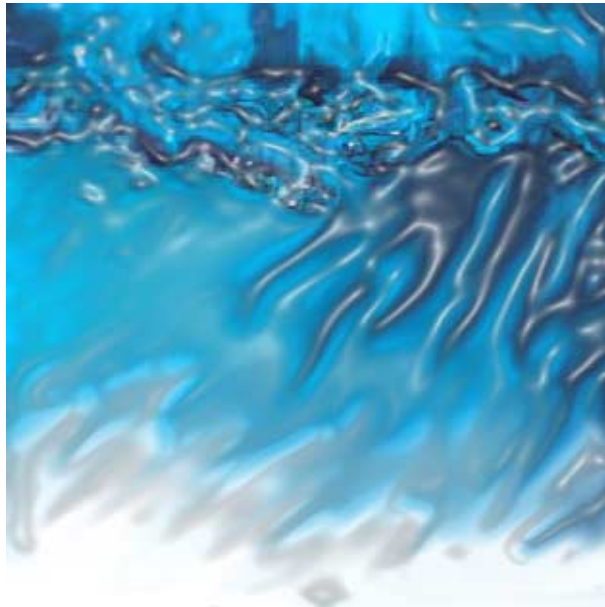
## Panel Discussion, Panel Member-4

**Cheng Xiaotao**

*Director*

*Water Disaster Mitigation Center, IWHR*

*People's Republic of China*



**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# How to formulate appropriate means of reducing the vulnerability of the poor ?

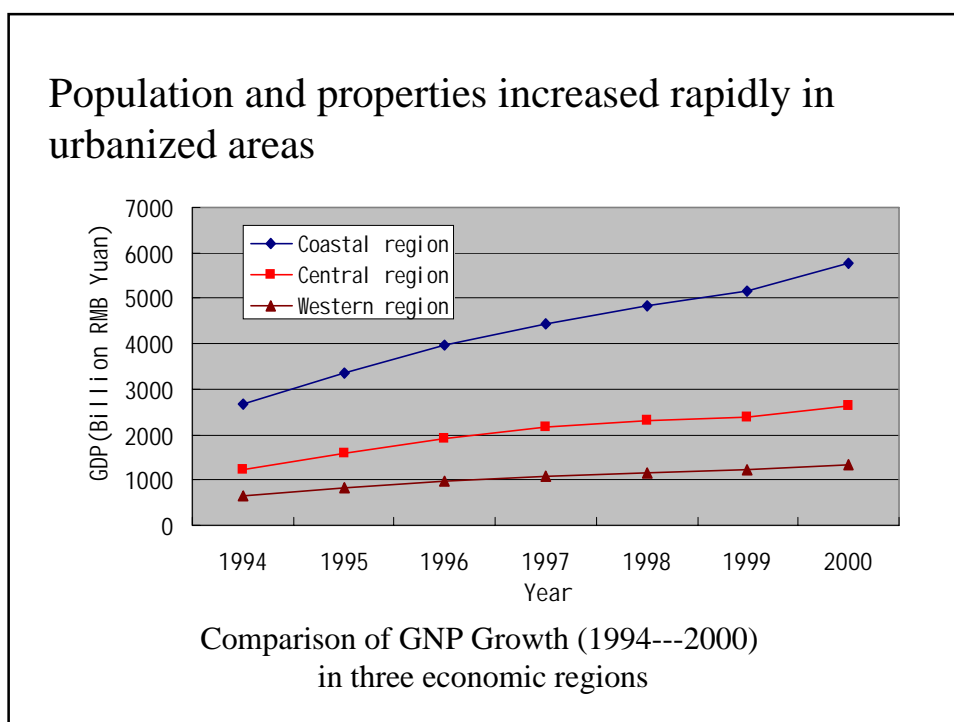
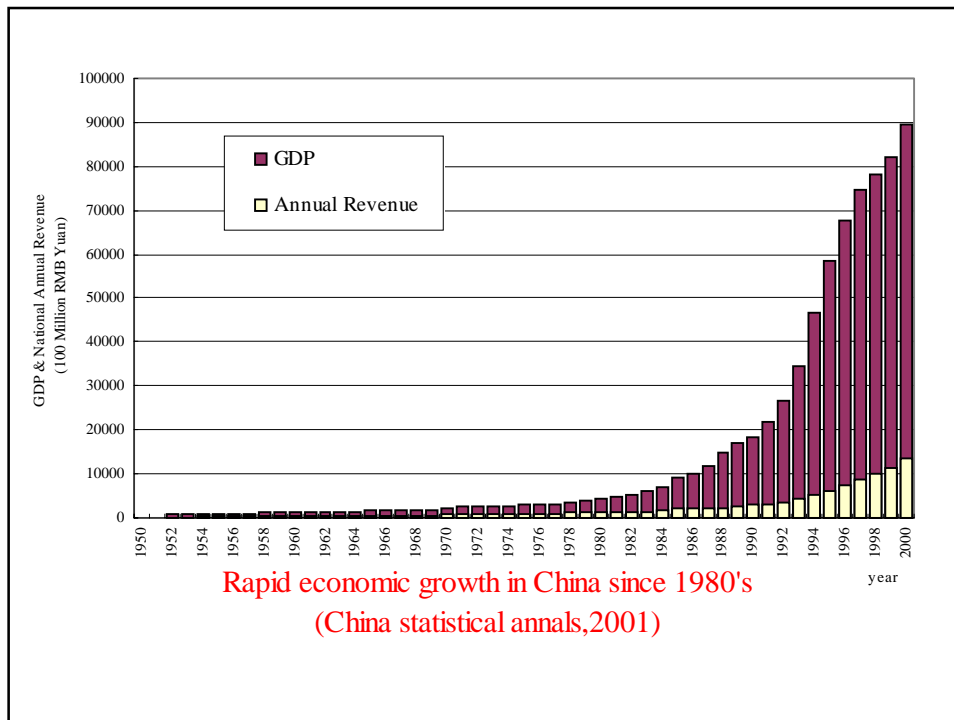
Cheng Xiaotao

Water Disaster Mitigation Center

China Institute of Water Resources and  
Hydropower Research, IWHR

March 2003, Kyoto





## **Reconsidering the current flood control measures**

- Ensuring safety: high standard of flood protection
- Reducing damages: Restriction of economic development in flood detention areas



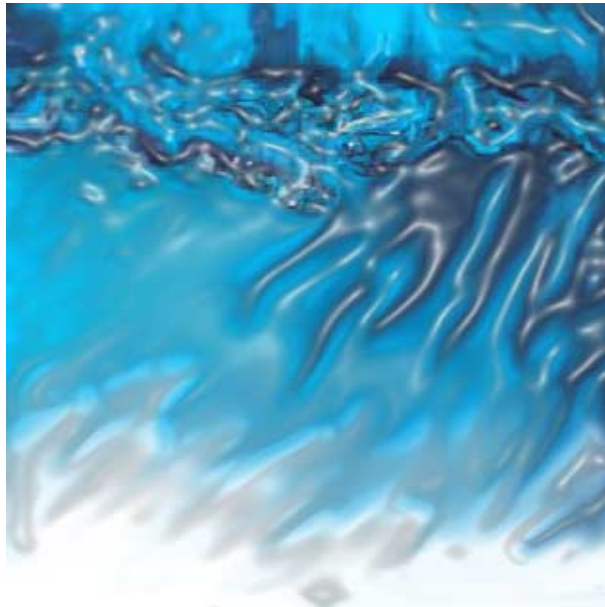
- Increased gap between Poor and Rich areas

**What kind of the flood management system should be established that is proper to reduce such gap between poor and rich areas ?**

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## **2. RECORD OF SESSION**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

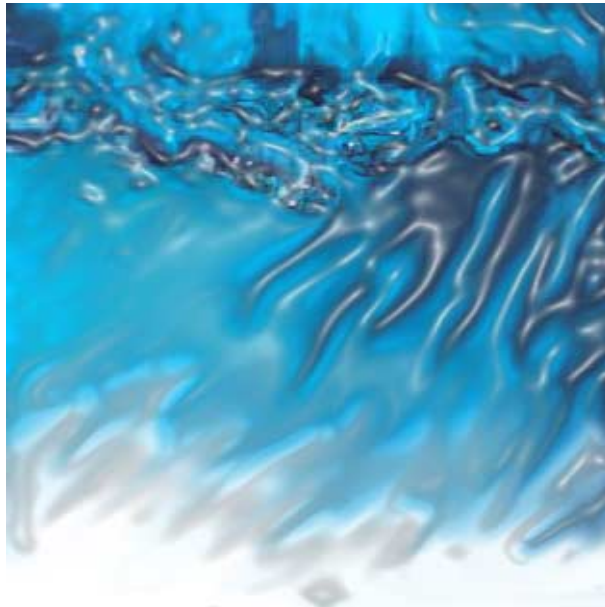
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## **(1) SESSION PLAN**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# Plan of Session

## **A. Session Time and Location**

**Day:** March 18, 2003; Tuesday

**Location:** Kyoto International Conference Hall, Room D

**Time:** 12:30 to 15:15

**Language:** English

## **B. Session Purpose**

The purpose of this session is to formulate appropriate means of reducing the vulnerability of the poor to the negative impacts of floods by drawing on lessons learned from international development cooperation in the Asian region; and from four regional workshops held on the subject of Poverty and Floods as part of the initiative for the 3<sup>rd</sup> World Water Forum.

## **C. Session Objectives**

The objectives of this session are:

1. To examine the impacts of floods, both positive and negative, on people living in flood-prone areas taking into consideration the wide range of different geographic, climatic, socio-economic, and cultural conditions represented in the Asian region;
2. To examine the effectiveness of current flood protection and mitigation measures in terms of (i) higher and better use of natural resources within a river basin; (ii) enhanced economic development; (iii) improved living standards; and (iv) reduced flood hazard and risk for people living in floodplains;
3. To identify the best Asian regional practices for managing floods to mitigate their negative impacts and to enhance their positive impacts;
4. To provide basic concept for improved flood management with a view to reducing the vulnerability of the poor to floods;
5. To strengthen regional networks linking organizations responsible for formulating policies and practices concerned with flood management and poverty reduction.

## **D. Session Composition**

The session comprises presentations of case studies from different Asian countries, each case study chosen to demonstrate good flood management practices based on mitigation of negative impacts and enhancement of positive impacts, particularly in relation to the poor. A panel discussion will follow the presentations to provide an opportunity for participants to raise questions and to enable expert representatives from different Asian regions to highlight important issues and recommendations. A wrap-up of the session will be made by the chairperson after the panel discussion to summarize the main findings and conclusions of the session.

The case studies were selected from among those presented in four regional consultation workshops organized by the session conveners in Bangladesh, Philippines, People's Republic of China (PRC), and Viet Nam. Panelists will be regional expert representatives selected by the conveners with the following recognized expertise:

- River Basin Management Specialist (Shun-ichi Maeda, JICA Expert for Water Resources Policy, Japan Ministry of Land, Infrastructure and Transportation)
- ODA Specialist (Senichi Kimura, Director, Japan International Cooperation Agency)
- Flood Management Specialist (Ian B Fox, Principal Project Specialist, Asian Development Bank (ADB))
- Flood and Drought Disaster Reduction Specialist (Cheng Xiaotao, Director, Water Disaster Mitigation Center, China National Institute of Water Resources and Hydropower Research (IWHR))

The Chairperson selected to preside over the panel discussion is Mr. Hidetomi Oi, Senior Advisor, Institute for International Cooperation, JICA.

## **E. Session Agenda**

<b>Agenda for Session on Poverty and Floods (18 March 2003)</b>				
<b>Time</b>	<b>Duration (min)</b>	<b>Format and topic</b>	<b>Speaker/Participant</b>	<b>Organization</b>
12:30 – 12:40	10	Opening Remarks	Session Chairman	JICA
12:40 – 14:00	80	Presentation of 5 Case Studies	Presenters	MLIT, JICA and ADB
14:00 – 14:30	30	Panel Discussion on the theme of “Best practices to reduce the vulnerability of the poor to the negative impacts of floods”	Panel members from MLIT, JICA, ADB and IWHR (PRC)	MLIT, JICA, ADB and IWHR
14:30 – 15:00	30	General Discussion (Q&A)	Session participants and presenters	MLIT, JICA ADB and IWHR
15:00 – 15:15	15	Wrap-Up	Session chairperson	JICA

## **F. Session Case Study Presentations**

The case studies to be presented at the session, selected from among the best presentations made at four regional Workshops held for the planning of the session, are as follows:

1. Flood Damage Restoration Works with Structures in Ormoc City, The Philippines;
2. Sustainable Management of the Brantas River Basin in Indonesia;
3. Flood Proofing and Livelihood Improvement in Bangladesh;
4. Lessons Learned from Operation of Flood Detention Basins in China;
5. Living with Floods in the Mekong River Delta of Viet Nam.

## **G. Session Plan**

### **1. Opening Announcement**

A representative of one of the convening organizations will make an opening announcement of the session and will introduce the Chairperson.

### **2. Chairperson's Functions and Address**

- (i) Introduction of panelists and case study presenters;
- (ii) Explanation of the following topics:
  - Purpose and objectives of the session;
  - Positive and negative impacts of floods on the poor;
  - Different flood management approaches adopted in accordance with different geographic, climatic, socio-economic, and cultural conditions
  - Brief description of the case studies.

### **3. Presentation of Case Studies**

- (i) The case study from the Flood Damage Restoration Works with Structures in Ormoc City in The Philippines illustrates the necessity of rapid rehabilitation of flood control works following disastrous flash flooding in a steeply sloped river after torrential rain. The restoration was designed to provide protection from floods larger than what occurred in November 1991 that left 8,000 dead and missing. All construction works were completed in August 2001 and Ormoc City residents now enjoy relief from the threat of flash flood disasters; producing measurable local poverty alleviation, and contributing to the development of the regional economy.
- (ii) The case study from the Sustainable Management of the Brantas River Basin in Indonesia, illustrates the effectiveness of flood protection and mitigation in promoting balanced regional development and its sustainable management system. It is a case study on how economic development contributed to poverty alleviation. The development project consisted of multipurpose dams, river improvement works, irrigation systems, drainage systems, and other mainly structural flood management measures. The focus of most newly built components of the project in recent years has shifted to non-structural measures,

including for example the integration and improvement of river basin management systems and the implementation of flood forecasting and warning systems to mitigate or to prevent future flood disasters.

- (iii) The case study on the Flood Proofing and Livelihood Improvement in Bangladesh illustrates the importance of flood proofing as a complementary measure to structural flood protection to reduce risk and vulnerability of poor people. In Bangladesh floods are a recurring phenomenon that necessitates *living with floods* as a way of life. Most farmers have no other means of livelihood and are highly vulnerable to flooding. Flood mitigation projects include small-scale flood control works complemented by training and social support systems to generate new means of producing income; and improvement of living conditions through better primary health care, promotion of self-reliance, local participation in community decision making, and flood-proofing of houses. Poverty alleviation is an integral part of the project that builds on the participatory approach and includes self-managed savings and credit programs, cost-sharing, and institutional building.
- (iv) The case study on “Lessons Learned from Operation of Flood Detention Basins in China” illustrates the potential for reducing the cost of flood control measures while also enhancing environmental conditions and the safety of poor people living in flood-prone areas. In the past 50 years traditional areas used for flood retention basins have been given over to agriculture, aquaculture, and many other types of rural development incompatible with the former nature of the natural wetlands of these flood control basins. The government is currently undertaking a major effort to reestablish 98 of these former wetland flood detention areas along the Changjiang River, Yellow River, Huai River, and the Hai River to store excess flood water volume and to reduce flood water peaks. The total area of these rehabilitated flood retention areas will be 35,000 sq Km with a natural storage area of 98 million cu m. The major problem facing the government in reestablishing these traditional flood retention basins is to mitigate the impacts of controlled flooding on the 18 million people currently living within these basins. This case study considers the government’s plans and actions to mitigate the impacts of this non-structural flood mitigation measure through development of the local economy, better flood management planning, construction of flood resistant infrastructure, and improvement of the capacity of local officials and households to recover from the negative impacts of controlled flooding within flood retention basins in the shortest period of time.

- (v) The case study on “Living with Floods in the Mekong River Delta of Viet Nam” illustrates the benefits of the incorporation in flood management strategy of low-tech measures and traditional coping techniques to enhance safety and improve incomes in a large area subject to annual flooding lasting several months. One of the favored low impact options being developed for living with floods in moderate flooding areas is providing low cost loans to households to raise their individual houses on piles above the highest expected flood water level. Another strategy in deep flooding areas is to build elevated earthen homesteads above the highest flood water level for entire villages; either as satellite villages or as linear areas along flood evacuation roads. This case history describes the positive and negative perceptions of these and other non-structural methods for keeping people safe from annual flooding from the perspective of the flood impacted households themselves. Also discussed is the formulation of a self funding Water Disaster Self Reliant Fund to be used to provide the most disadvantaged individuals and households with means to resume their livelihood and for local government to recover from floods in the shortest possible period of time at the end of the cycle of annual flooding in the Mekong Delta.

**4. Panel Discussion**

The Panel will discuss the draft conclusions and recommendations of the session, together with the case study findings. Questions from participants, in the form of written questions on cards, will be accepted and responded to by the panelists. Conclusions will be incorporated into the draft Theme Paper on Poverty and Floods.

**5. General Discussion**

The chairperson will encourage discussion of the points raised and of the issues identified by the panel.

**6. Wrap-Up of Summary and Conclusions**

The chairperson will wrap-up the session by summarizing the main conclusions and recommendations, including any action plans proposed and agreed to by the session participants.

## H. Session Participants

<b>Title or function</b>	<b>Name</b>	<b>Title</b>	<b>Organization</b>	<b>Country</b>	<b>Contact e-mail</b>
Chairman	Hidetomi Oi	Senior Advisor	Institute for International Cooperation, JICA	Japan	Oi.hidetomi@jica.go.jp
Case study presenter-1	Bernardo P. Aman	OIC-Project Director	Project Management Office for Major Flood Control Projects, Department of Public Works and Highways	Philippines	
Case study presenter-2	Usman Rusfandi	President	Jasa Tira Public Corporation	Indonesia	pjt@malang.wasantara.net.id
Case study presenter-3	Md Zahangir Alam	Project Director	Local Government Engineering Department	Bangladesh	Ce-lged@bangla.net
Case study presenter-4	Jinchai Huang	Director	Flood & Drought Mitigation Center, China National Institute of Water Resources and Hydro Power Research (IWHR)	People's Republic of China	hjc@iwhr.com
Case study presenter-5	Dang Quang Tinh; and Pham Thanh Hang	Head, Standing Office of the Central Committee for Flood and Storm Control; and Programme Coordinator	Ministry of Agriculture and Rural Development; and United Nations Development Programme	Vietnam	dqtinh@dmu.netnam.vn hang@undp.org.vn
Panel member-1	Shun-ichi Maeda	JICA Expert for Water Resources Policy	MLIT	Japan	shunshun@cbn.net.id
Panel member-2	Senichi Kimura	Director	JICA	Japan	Kimura.Senichi@jica.go.jp
Panel member-3	Ian B. Fox	Principal Project Specialist	ADB	Philippines	ifox@adb.org
Panel member-4	Cheng Xiaotao	Director	Water Disaster Mitigation Center, IWHR	People's Republic of China	chengxt@iwhr.com

## **I. Draft Conclusions and Recommendations**

*[The following draft conclusions and recommendations were developed based mainly on case study presentations and discussions heard at the four regional workshops held to develop input to the 3<sup>rd</sup> World Water Forum session on Poverty and Floods. It is expected that these draft statements will be added to or modified through the case study presentations and discussions to be heard during the session on Poverty and Floods in Kyoto in March.]*

Flooding, especially that experienced annually in many parts of Asia (including Bangladesh, Cambodia, India, Indonesia, Pakistan, Philippines, PRC, and Viet Nam), has both beneficial and harmful impacts. When the duration and depth of flooding are not excessive, floods rejuvenate wetlands forming the natural breeding grounds of diverse aquatic plants, fish and animals which are the fundamental sources of income and food for the poorest of the poor floodplain residents; and bring natural sediments and nutrients that are beneficial to agriculture. Floods also replenish surface reservoirs and groundwater basins, providing a reserve against dry season water shortages and drought. Such socio-economic benefits favorably impact on the society as a whole.

On the other hand, flash flooding, excessively deep flooding, and floods of long duration, can cause widespread suffering and severe household shocks, such as death by drowning of children and illness of income-producing adults. Such flooding exacerbates poverty by limiting access to income-earning activities, destroying vital infrastructure and services, and wiping out investments in agriculture, aquaculture, and personal property. These adverse impacts affect the poorest households most severely.

Although the complete elimination of flood disasters is impossible, flood damage can be mitigated through flood management which integrates considerations of integrated natural resources management, appropriate levels of economic development, reasonable levels of investment based on flood hazard, enhanced institutional capacity, and better opportunities for the poor to earn income. Specific recommendations for achieving effective flood management are as follows:

- All stakeholders, including both administrators and the general population which benefits economically, socially, and culturally from the water resources of a river basin, must have a say in how these resources are to be used and conserved. Both must also have a say in how floods should be managed to minimize their adverse impacts while also maximizing their beneficial impacts.

- Effective flood management requires a comprehensive approach that balances flood mitigation, environmental conservation, and sustainable utilization of available water resources for the benefit of all people of a nation.
- The preservation of life and the protection of the welfare of households should be given the highest priority in the design of flood protection works; flood proofing and emergency evacuation measures should accompany all structural interventions.
- The conception and design of flood protection should be based on careful analysis of risk so that the passage of greater-than-design floods can be managed in a predictable and safe way.
- Capacity building of organizations responsible for managing river basins and for raising public awareness through grassroots education for flood disaster preparedness is to be incorporated in all flood management programs as effective means of reducing risks and loss of life from floods.
- Flood containment to a high standard of protection is recommended for urban and other densely populated areas where the potential for ever larger flood induced losses is increasing due to population growth and to large investments in infrastructure and community services.
- Improper planning, design, construction, operation, maintenance, and repair of flood mitigation structures, such as reservoirs and embankments, may significantly increase the risk of floods. To preclude devastating damage caused by floods, relevant agencies should take such risks into account in the planning and design of facilities, and they should recognize the importance of providing appropriate construction, operation, maintenance, and repair.
- As much as possible, flood management should be designed and implemented to minimize adverse impacts on the natural condition in a river basin with optimum use made of balanced structural and non-structural approaches. Qualitative improvement and, where appropriate, quantitative improvement of flood mitigation and management are required to assure more substantial contribution to poverty reduction.
- Many communities have developed traditional means of coping with frequent, low-intensity floods; and flood mitigation projects implemented by governments should incorporate these traditional means where possible to minimize the adverse impacts of floods.
- There is scope in many parts of Asia to make houses less vulnerable to floods, to provide shelters from storm surges and unusually deep floods, and to

establish a network of evacuation roads for people and livestock. Similarly, in some parts of Asia, there is scope to use flood forecasting and warning systems. Where appropriate, such low-cost or low-impact flood mitigation measures should be adopted.

- There is also potential in parts of Asia to develop effective and affordable flood damage insurance for crops and property, and this should be used where suitable geographical and socio-economical conditions exist as a means of discouraging unreasonable levels of investment in flood-prone areas and of protecting the assets and livelihoods of persons living in these zones.

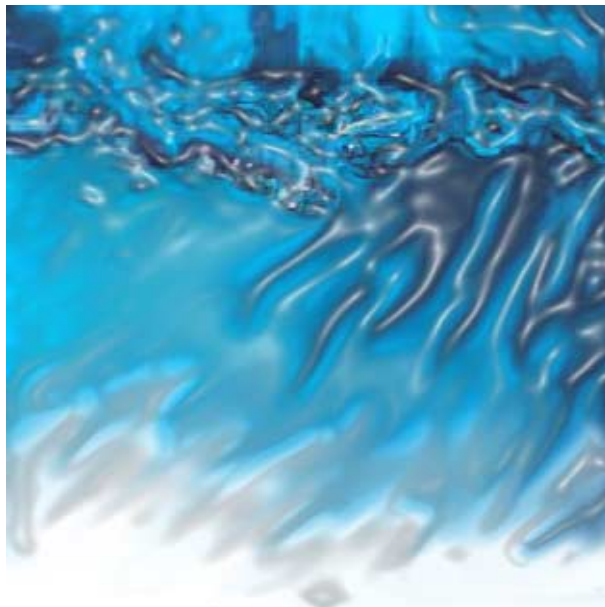
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## **(2) SESSION REPORT**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# セッションレポート ( Session Report Submitted to The 3<sup>rd</sup> World Water Forum )

<b>SESSION CODE: FLOD - 03</b>	
<b>Name of Convener(s): Japan Ministry of Land, Infrastructure and Transport (MLIT), Japan International Cooperation Agency (JICA), Asian Development Bank (ADB)</b>	
<b>DATE:</b> <b>- March 18, 2003 (12:30-15:15)</b>	<b>Session Title:</b> <b>Poverty and Floods</b>
<b>Contact information in Japan</b>	<b>Accommodation:</b> <b>Toyoko Inn Gojo Kyoto</b>
	<b>Contact No.:</b> 090-1461-9869
	<b>Contact E-mail:</b> kawakami@ctii.co.jp
<b>Reporter/Rapporteur: Marshall Silver</b>	
<b>Contact E-mail :</b> marshallsilver@yahoo.com	

## 1. Key Issues

- Millions of people suffer from floods every year through loss of life, property, means of livelihood, social services and access to vital infrastructure. These adverse impacts affect the poorest segments of the society most severely
- Flood vulnerability of the poor has been increasing as a result of the cycle of population growth, environmental deterioration and the increase in the number of poor living in high flood risk areas
- The lack of capacity to limit the negative impact of floods remains a major burden for developing countries; mainly due to limited resources and the unlimited need for these resources to address pressing issues in all sectors of development
- Thus, despite achievements made to date, flooding has been increasing in terms of frequency, damage and vulnerability of the poor; aggravating poverty conditions and hampering the social and economic development of communities/regions/countries

## 2. Actions and Recommendations

- In the selection of projects, priority should be placed on projects, which will contribute more to poverty alleviation, by including “poverty alleviation” in the criteria for project selection.
- In the decision-making process of projects, opinions of the poor should be appropriately reflected, so as to minimize the adverse impact and to maximize the beneficial impact of the projects for the poor.
- Likewise, in the design of projects, livelihood improvement, job creation and other pro-poor elements should be considered, in order for the poor to benefit from the projects as much as possible.
- Different approaches should be adopted according to the conditions of flood prone areas: High

priority areas should be identified through regional and river basin planning for a high standard of flood protection; while in other areas providing protection of essential sources of livelihood, and maintaining the benefit of positive impacts from floods for agriculture, aquaculture, etc.

- The advantage of traditional means of coping with frequent, low-intensity floods developed by communities should also be considered.
- Flood vulnerability analysis should be the starting point of preparation and operation for flood mitigation and management plan.
- In view of the ever increasing vulnerability to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to local conditions.

### 3. Session Report to Plenary of Floods Group Presented by Mr. Marshall Silver

#### Poverty and Floods - 3rd WWF - Kyoto Japan - 18 March 2003

Session: **FLOD - 03**

Date: **18 March 2003 (12:45 to 15:30)**

Location: **Room D, Kyoto International Convention Center**

Number of Participants: **240**

Session Format: **Case studies, panel discussion and audience participation**

Chair Person: **Mr. Hidetomi Oi**, Senior Adviser (JICA)

Case Study Presenters:

**Mr. Bernardo P. Aman**: OIC-Project Director (DPWH, Philippines)

**Mr. A. Rusfandi Usman**: Lecturer (Eng. Brawaijaya Univ., Indonesia)

**Mr. Md. Zahangir Alam**: Project Director (LGED, Bangladesh)

**Mr. Huang Jinchi**: Director (IWHR, PRC)

**Mr. Dang Quang Tinh**: Head (MARD, CCFSC, Vietnam)

**Ms. Pham Thanh Hang**: Programme Coordinator (UNDP, Vietnam)

Panelists:

**Mr. Shunichi Maeda**: JICA Expert (MLIT)

**Mr. Senichi Kimura**: Director (JICA)

**Mr. Ian Fox**: Principal Project Specialist (ADB)

**Mr. Cheng Xiaotao**: Director (IWHR, PRC)



## Poverty and Floods - 3rd WWF - Kyoto Japan - 18 March 2003

### Summary

#### Main Topics Discussed:

- ❑ Millions of people suffer from floods every year through loss of life, property, means of livelihood, social services and access to vital infrastructure. These adverse impacts affect the poorest segments of the society most severely
- ❑ Flood vulnerability of the poor has been increasing as a result of the cycle of population growth, environmental deterioration and the increase in the number of poor living in high flood risk areas
- ❑ The lack of capacity to limit the negative impact of floods remains a major burden for developing countries; mainly due to limited resources and the unlimited need for these resources to address pressing issues in all sectors of development
- ❑ Thus, despite achievements made to date, flooding has been increasing in terms of frequency, damage and vulnerability of the poor; aggravating poverty conditions and hampering the social and economic development of communities/regions/countries

#### Main Points Raised at the Session on Poverty and Floods:

- ❑ Learning to “live with floods” based on local conditions - for both positive and negative impacts
- ❑ Better data collection and information gathering is needed to quantify impacts on the poor
- ❑ Capacity building at the grassroots for design, construction, operation and maintenance
- ❑ Preparedness, including capacity building, flood insurance and ongoing maintenance
- ❑ Appropriate structural measures together with non-structural measures
- ❑ From now to the next WWF, how much flood induced poverty do we plan to reduce



## Poverty and Floods - 3rd WWF - Kyoto Japan - 18 March 2003

### Conclusions/Recommendations to Reduce Poverty Caused by Flooding:

1. In the selection of projects, priority should be placed on projects, which will contribute more to poverty alleviation, by including “**poverty alleviation**” in the criteria for project selection
2. In the decision-making process for projects, the **opinions of the poor** should be appropriately reflected, to minimize the adverse impact and to maximize the beneficial impact of flood projects for the poor
3. Likewise, in the design of projects, improvement of livelihood, job creation and other **pro-poor elements** should be considered, in order for the poor to benefit from the projects as much as possible
4. Different approaches should be **adopted for the poor** according to the conditions of flood prone areas: High priority areas should be identified through regional and river basin planning for a high standard of flood protection; while in other areas providing protection of essential sources of livelihood, and maintaining the benefit of positive impacts from floods for agriculture, aquaculture, etc.
5. The advantage of **traditional means of the poor** for coping with frequent, low-intensity floods - developed by communities - should be considered
6. Flood vulnerability analysis should be the starting point of preparation and operation for flood mitigation and management plans, **especially for the poor**
7. In view of the ever increasing **vulnerability of the poor** to floods in many countries, more resources should be allocated to flood mitigation and management projects of various types appropriate to local conditions



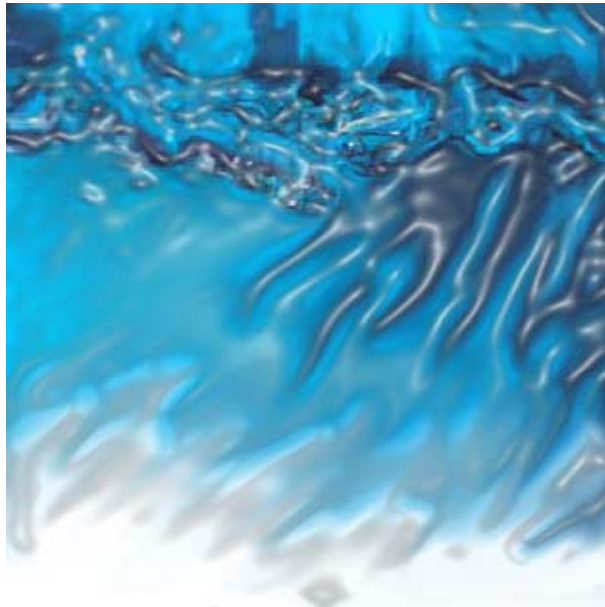
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### **(3) COMMENTS FROM PANELIST AND AUDIENCE**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

## パネリストや聴衆からの主なコメント

### 1. PANEL MEMBER'S COMMENTS

- (1) Physical solutions for flood water drainage can change wetlands into productive agricultural land
  - ☐ Results in the flood protected area are better transport, better housing, and less water-born diseases
  - ☐ Hardened flood control channels are needed in highly urbanized, high value urban areas
  - ☐ Baseline data is often lacking to show that flood control measures in alleviating poverty
- (2) Message from JICA on Poverty and floods
  - ☐ JICA strongly advocates poverty reduction in all water development projects
  - ☐ Use more pro-poor approach to the development of assistance in the water sector
- (3) Reducing the vulnerability of the poor to the negative impacts of floods
  - ☐ Not all impacts of floods are negative, and structural solutions of scaling up small scale structural solutions are not always the best way to mitigate the impacts of catastrophic floods
  - ☐ Engineering approach to flood control does not always work - due to changes in river morphology and the need for constant operation and maintenance, forever
  - ☐ Crisis management is not the best way to deal with floods
  - ☐ Movement upstream to bridge the gap between relief and recovery
  - ☐ More preparedness can lead to flood crises that can be managed
  - ☐ Maximize the beneficial impacts of floods, and conserve wetlands
- (4) How to formulate appropriate means of reducing the vulnerability of the poor to floods
  - ☐ The gap between poverty in different parts of a developing country can be extreme -
  - ☐ What flood management strategy will have the ability to best reduce the gap between the rich and the poor

## 2. COMMENTS OF THE AUDIENCE ON THE DRAFT CONCLUSIONS OF THE SESSION

- (1) Appropriate Government policies are not always in place to mitigate the impact of floods
  - ☐ The poor most often live in marginal areas such as in the flood plains of rivers
  - ☐ Such policy is often concerned with land use and land tenure in flood prone areas
  - ☐ The recommendation for Government control of changing land use modes should be a strong outcome of the session
- (2) There should be targets established for reducing the impacts of floods on poverty
  - ☐ From now to the next WWF, how much flood induced poverty do we plan to reduce
  - ☐ We should make efforts to better clarify and quantify the economic impacts of floods on the poor through better data collection and information gathering
- (3) How do we enhance the ability of the poor to maximize the positive benefits that can be achieved from floods
- (4) The poor, and all other stakeholders must participate in decision making on how to mitigate the impact of floods
  - ☐ The participatory approach must be fundamental in project preparation
  - ☐ The poor must be involved in the planning implementation, and management of flood control programs and projects
  - ☐ All flood mitigation methodologies must have a strong component for sustainability for the continued success of community based disaster management schemes
- (5) Better knowledge of the source of flooding should be a recommendation of the session
  - ☐ What is the impact of river morphology on the severity of flooding
  - ☐ What are the environmental causes that are increasing the frequency and magnitude of floods
- (6) Non-structural methods of flood preparedness should be stressed over structural methods of flood control
- (7) Knowledge of the biological impacts of a flood are an important issue for the poor
- (8) More lessons learned should be presented for the case study examples
- (9) The panel should endorse the reclamation of prior wetlands by the poor as a non-structural measure of flood mitigation and as a self help method for the alleviation of poverty through work
- (10) Lessons learned from the case studies should be incorporated into national disaster management and development policies

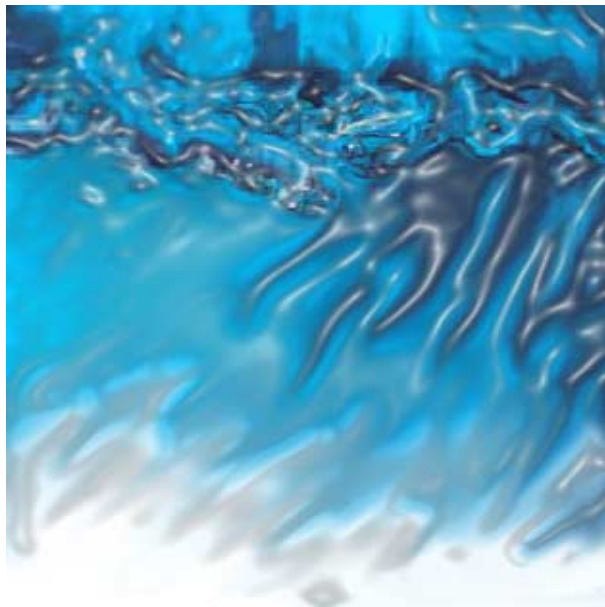
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### **3. OTHERS**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

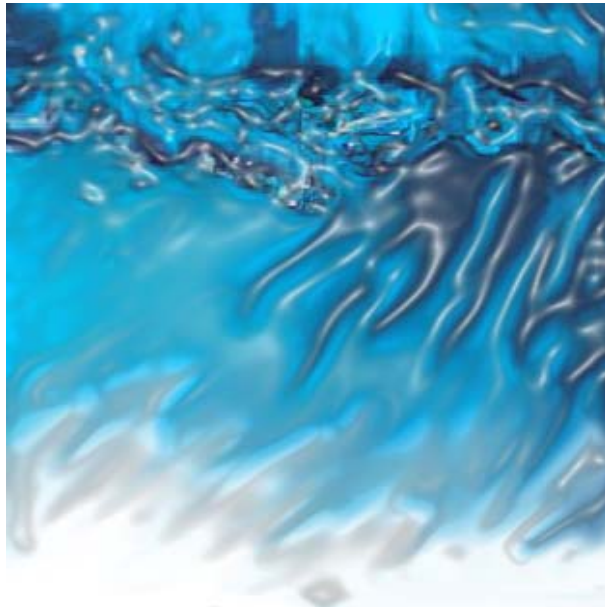
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## **(1) ACTIVITIES OF JICA ON POVERTY ALLEVIATION AND FLOOD DISASTER MITIGATION**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

The 3<sup>rd</sup> World Water Forum

Session: Poverty and Floods

March 18, 2003; 12:30 - 15:15

Kyoto International Conference Hall, Japan

## **Activities of JICA on Poverty Alleviation and Flood Disaster Mitigation**

**March 2003**

**Japan International Cooperation Agency (JICA)**

# Activities of JICA on Poverty Alleviation and Flood Disaster Mitigation



The 3<sup>rd</sup> World Water Forum

Session: Poverty and Floods

March 18, 2003, 12:30 - 15:15

Kyoto International Conference Hall, Japan

## 1. INTRODUCTION

The Japan International Cooperation Agency (JICA) has been fighting on many fronts to reduce poverty in developing countries with the ultimate goal of achieving “people-centered development” that focuses on the lives and welfare of individual human beings, not just economic growth.

Extracting knowledge from Japan’s experience that projects for flood control contributed to better living for the poor, flood control projects can be designed to improve livelihood and create jobs for the poor. JICA has provided assistance to the poor with many flood control mitigation programs which have a balance with structural and non-structural measures. This paper describes the activities of JICA on the poverty alleviation and flood disaster mitigation.

Section 2 of this paper gives a brief description of JICA. The performance of JICA on poverty alleviation and flood disaster mitigation are discussed respectively in Sections 3 and 4. JICA’s contribution to poverty alleviation and flood disaster mitigation throughout the world is exemplified in three case studies or projects as presented in Section 5. Goals and recommendations on flood control programs implemented in the future are given in Section 6, while the conclusion is in Section 7.



**Figure-1 Poverty Dwelling on Riverbank**

## 2. WHAT IS JICA

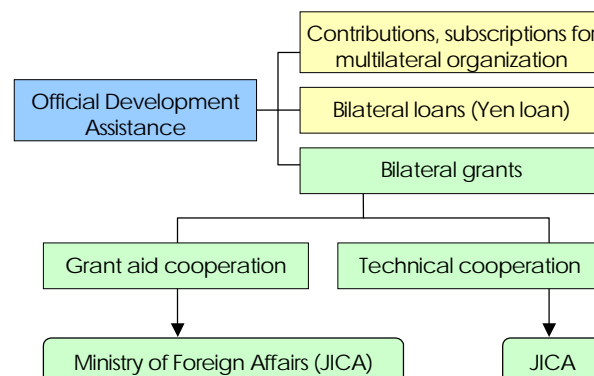
Japan under its Official Development Assistance (ODA) presently stands as the major donor to 25 developing countries in their quest for socio-economic development. The provision of economic cooperation is based on the concepts of “humanitarian and moral considerations” and “the recognition of interdependence among nations.”

There are three main categories of Japan’s ODA, namely:

- (1) Contribution and subscription to multilateral donor organization;
- (2) Bilateral Loan (generally known as “Yen Loan”); and
- (3) Bilateral Grant.

Bilateral grants are mostly provided through the Japan International Cooperation Agency (JICA), which was established in 1974. JICA is responsible for the implementation of technical cooperation and the support for grant-aid cooperation programs of the Japanese Government.

JICA has been providing developing countries with assistance for poverty alleviation and flood disaster mitigation through technical cooperation and the support for grant-aid cooperation.



**Figure-2 Responsibility of JICA under ODA**

### 3. PERFORMANCE OF JICA ON POVERTY ALLEVIATION

#### 3.1 POVERTY IN THE WORLD

There are 1.3 billion people living in poverty in the world at present. This translates to 1 person in 5 of the overall world's population, and 1 person in 3 in developing countries. Statistics compiled by the World Bank reveal that 520 million of these people are in Southeast Asia.

In 1996, the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) issued a strategy entitled "Shaping the 21<sup>st</sup> Century" that established the specific goal of "reduction by one-half in the proportion of people living in extreme poverty by 2015."

#### 3.2 POVERTY ALLEVIATION BY JICA

Since the beginning of the 1990's, JICA has been conducting activities to support poverty reduction. To promote its anti-poverty measures directly, JICA established the "Community Empowerment Program or Grassroots Technical Cooperation Project" in FY 1997 to serve as the framework of cooperation on poverty reduction to benefit the local residents.

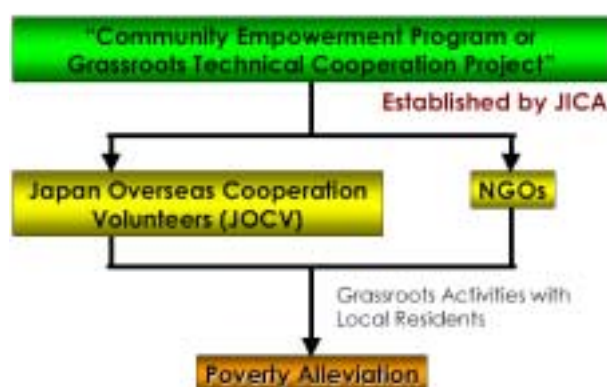


Figure-3 Poverty Alleviation

Under this initiative, JICA and NGOs cooperate at the regional level and through this collaboration, JICA has implemented a large number of projects designed to meet the needs of local communities. In addition, some 2000 members of the Japan Overseas Cooperation Volunteers (JOCV) have been dispatched since 1965 at any given time throughout the world. These volunteers are engaged in a variety of grass-root activities with the participation of local residents.

### 4. PERFORMANCE OF JICA ON FLOOD DISASTER MITIGATION

#### 4.1 FLOOD DISASTERS IN THE WORLD

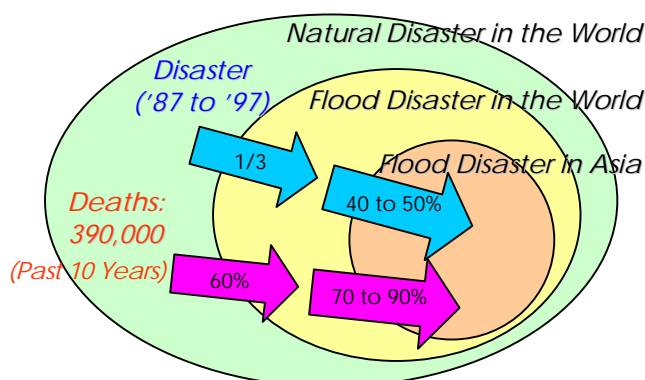
Flood disasters accounted for one-third of the natural disasters in the world in 1987-1997. Death due to natural disasters has been estimated at about 390,000 for the past 10 years, and 60% of these were caused mainly by floods. Socio-economic conditions, therefore, have suffered seriously from floods, and 40 to 50 percent of those floods and 70 to 90 percent of the dead had occurred in the Asian countries.

Furthermore, vulnerability to floods has aggravated, and additionally, poverty population has increased in flood hazard areas. The vicious cycle of population growth, environmental deterioration and poverty, as well as the widening cleavage between rich and poor, has become the cause of perennial flood disasters.

While no country is entirely safe against any flood disaster, developing countries in particular lack the capacity to prevent and prepare for it. Floods bring miseries to many developing countries, especially in Asia and specifically to the poorest and marginalized people who live in vulnerable, flood disaster areas.

There are some reasons why Asia is leading in flood damage, such as:

- (1) The geological conditions, which are unstable due to the frequent earthquakes, volcanic movements and faults in topography;
- (2) The monsoon and typhoon rains, which trigger adverse disastrous events like floods and landslides;
- (3) The short and steep rivers in Asia, which cause flush floods;
- (4) The rapid urbanization, which causes the increase of flood runoff volume and peak discharge; and
- (5) The population increase and concentration in flood prone areas.



**Figure-4 Flood Disasters in the World**

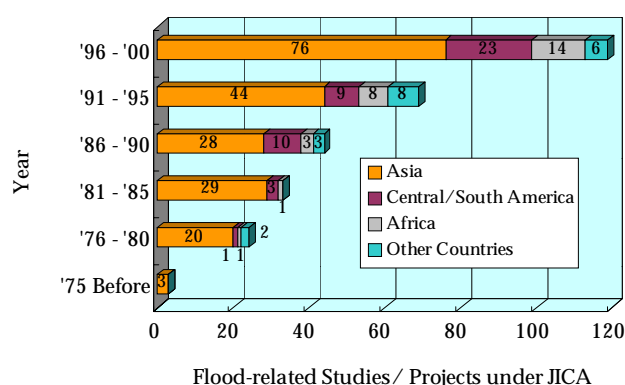
## 4.2 FLOOD DISASTER MITIGATION BY JICA

The performance of JICA concerning flood-related issues had increased due to the increase of flood disasters in developing countries for some reasons. Many poor families stay in flood prone areas, such as low-lying floodplains, river valleys regularly hit by flash floods, unstable steep lands and malaria-infested marshes. Flood disasters force people further into poverty, and poverty leads to chronic vulnerability to flood disasters in developing countries. Therefore, flood disaster mitigation is closely concerned in poverty alleviation.

JICA has been extending technical cooperation and

the support for grant-aid to the developing countries with flood mitigation projects. Since 1974, JICA had carried out 292 flood-related studies/projects under the schemes of development study, support for grant-aid program, and project-type technical cooperation.

The figure below shows the 5-year trend of these schemes in Asia, Central/South America, Africa and other countries. All schemes show an increasing trend due to the increase of flood disasters around the world. The 5-year trend presents a higher performance in Asia, while the schemes in Central/South America and Africa cover 30% in the latest 5 years from 1996 to 2000.



**Figure-5 Flood Disaster Mitigation by JICA**

## 4.3 THE TREND OF NON-STRUCTURAL FLOOD CONTROL MEASURES

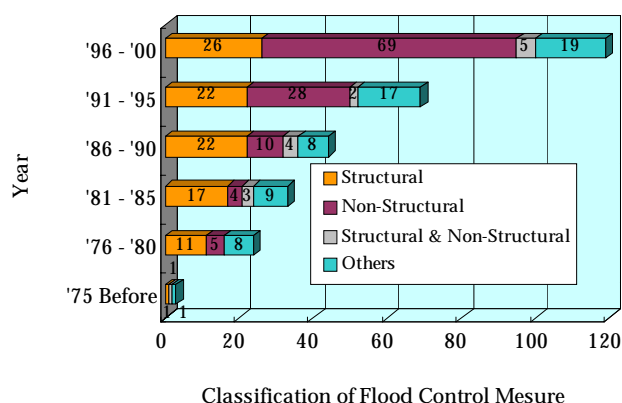
Flood control measures are classified into structural and non-structural measures. Typical structural flood control measures are dams and storage reservoirs, embankment of levee, channel improvement, floodway bypass and so on. On the other hand, non-structural measures include land-use control, flood forecasting and warning, evacuation drills, publication of hazard maps, relief activities, flood insurance and so on.

Non-structural measures are required when the following cases exist:

- (1) Structural measures are costly or not feasible, considering the Benefit-Cost ratio;
- (2) Financial constraint of the local government; and
- (3) The execution of structural measures is time-consuming.

Ideally, a combination of structural and non-structural measures is required for effective flood control, and JICA has been adopting both structural and non-structural measures to mitigate flood disasters. From 1975 to the 1980's, structural measures accounted for more than half of the flood-related projects implemented.

Non-structural measures prevailed in the 1990's and they cover more than half of the flood-related projects recently implemented. On the contrary, the annual average number of structural measures has not changed since the 1980's, so that the increase in the total number of projects is attributable to the increase of non-structural measures.



**Figure-6** Trend of Non-Structural Flood

## 5. JICA'S FLOOD CONTROL STUDIES/PROJECT THAT CONTRIBUTE TO POVERTY ALLEVIATION

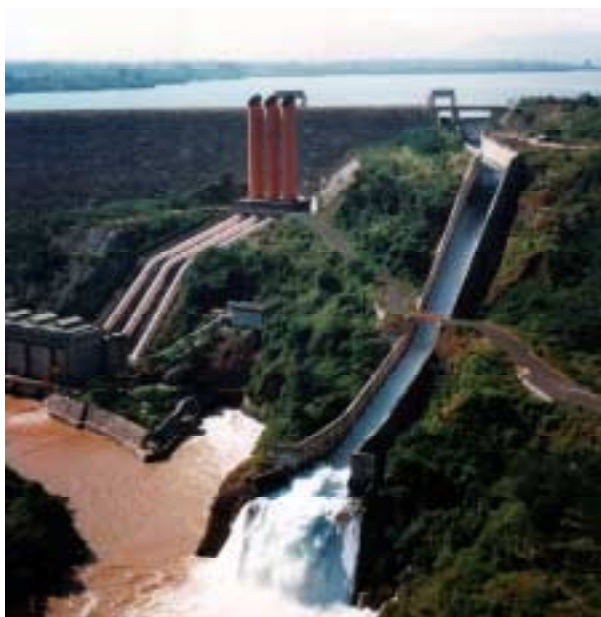
### Case-1: Comprehensive River Basin Development

The comprehensive river basin development project in Brantas, East Java, Indonesia, is a case of economic development that contributes to poverty alleviation. JICA had provided assistance for the development of the target area for more than 40 years since the period of OTCA (Overseas Technical Cooperation Agency), the original organization of JICA. The development projects consisted of multipurpose dams, river improvement works, irrigation systems, drainage systems and so on, which can be defined as structural measures.

Recently, however, the focus of projects has shifted to non-structural measures. For example, JICA now undertakes the integration and improvement of river basin management systems and the implementation of flood forecasting and warning systems to mitigate flood disasters.



**Figure-7** Wlingi Dam



**Figure-8 Karangates Dam Power Station**



**Figure-9 Brantas River Basin**



**Figure-10 Lodoyo Irrigation Canal**

During their long history of implementation, the projects have produced benefits, such as the increase of safety level against floods to a 50-year return period, electricity production of about 1.0 billion kWh per year, irrigation of 340,000 hectares of land, raw water supply of around 300 million m<sup>3</sup> per year for drinking water and industries, tourism and so on. These economic growth benefits have tremendously contributed to poverty alleviation.

### **Case-2: Post-Disaster Restoration Project**

The flood control project in Ormoc City in the province of Leyte, Philippines, is a typical case of a post-disaster restoration project. The project's objective was to develop the area by providing protection against floods larger than the one that took place in Ormoc in November 1991 accounting for 8,000 deaths and missing.

Prompt relief activities were initiated by the City Government of Ormoc, which was later on joined by other agencies of the central government, several Red Cross units, private entities, and many countries including the Government of Japan. As reported, donation from the different agencies reached a total of US\$ 5.8 million.

However, the threat of disastrous floods and the proliferation of people living along the rivers as well have not been removed. Therefore, from 1993 to 1994, a feasibility study was conducted by JICA for a flood control project in Ormoc City that will provide protection against a flood larger than the one in 1991.

With grant-aid from the Government of Japan, basic and detailed design works were carried out through JICA, and all construction works were completed in August 2001. The residents of Ormoc are now relieved from the threat of flood disaster and this

contributes to the development of the regional economy and the alleviation of poverty as well.



**Figure-11 Flood Situation**



**Figure-12 Post River Improvement**

### **Case-3: Flood Disaster Mitigation Focusing on Poverty**

Flood is a recurring phenomenon in Bangladesh. People in that country practically live with floods. Since farmers have no other means of livelihood apart from farming, they are very vulnerable to flood damage.

This case is a study on a rural development project involving flood proofing, which was implemented in perennially flooded areas of Bangladesh with the assistance of JICA. The project was especially directed towards poverty alleviation.

Flood mitigation projects in these areas require small-scale flood control programs due to financial constraint. Also, they require social approaches such as support to generate other means of income through training and education, improvement of living conditions through primary health care promotion, promotion of the idea of self-reliance and participation in the projects, and so on. Thus, the JICA study team formulated an integrated rural development plan, targeting small-scale flood mitigation and poverty alleviation.

Furthermore, to ensure the sustainability of the proposed projects, participatory approach, self-managed savings and credit programs, cost-sharing and institutional building were proposed.



**Figure-13 Flood Disaster Mitigation  
Focusing on Poverty**



**Figure-14 Participatory Approach in Rural  
Development Projects**

## 6. RECOMMENDATIONS ON FUTURE FLOOD CONTROL PROGRAMS

### 6.1 GOAL OF FLOOD DISASTER MITIGATION PROGRAM

Flood is still a major concern in the world, especially in Asia as explained before. Poor people dwelling in flood-prone areas and in flood hazard riverbanks are very vulnerable to disastrous floods.

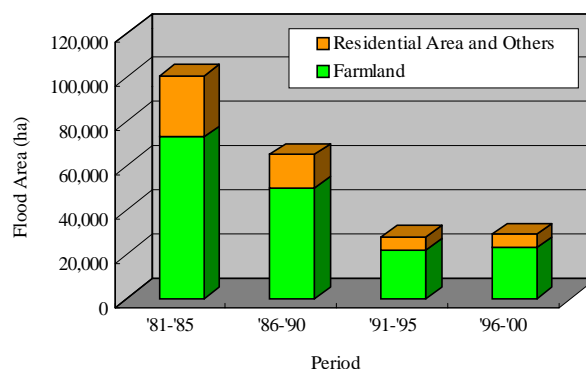
Two major goals of a flood disaster mitigation program are economic development and living condition improvement for inhabitants. Relieving the inhabitants of a river basin from the threat of devastating floods will contribute to the development of the regional economy and thus improve living conditions leading to the alleviation of poverty.

### 6.2 FLOOD DISASTERS IN JAPAN

For the realization of flood disaster mitigation in developing countries, the effectiveness of flood control in Japan is cited as an example.

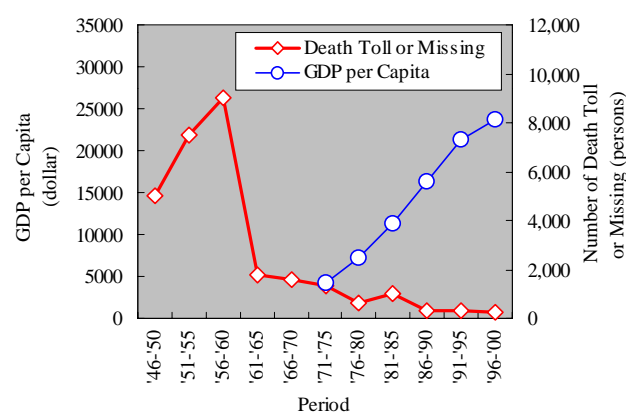
Figure 15 shows that the flooded areas in Japan have been decreasing in every 5 years because flood control projects were implemented since 1981.

On the other hand, Figure 16 presents the 5-year trend of Number of Missing and Deaths and Gross Domestic Product (GDP) per Capita in US dollars. The number of deaths or missing due to floods has been decreasing since 1960 because of the serious efforts on flood control. The flood control projects have contributed to the stability of livelihood and socio-economic development, which caused the increase of GDP per Capita from 1970 as graphically shown below. The growth of GDP per capita may have contributed to the increase of investment on flood control.



Source: Statistics of Floods, Ministry of Land, Infrastructure and Transport, Japan, 2001

Figure-15 Trend of Flood Area



Source: Statistics of Floods, Ministry of Land, Infrastructure and Transport, Japan, 2001

Figure-16 Trend of Number of Deaths or Missing and GDP per Capita

### 6.3 METHODS OF IMPLEMENTATION OF FLOOD DISASTER MITIGATION PROGRAMS

Some methods of implementation of flood disaster mitigation programs have contributed to poverty alleviation. For example, comprehensive river basin development ranging from flood control to hydropower development, supply of water for domestic and industrial uses, and irrigation, like the case of river basin management in Indonesia, are effective measures for the development of the regional economy.

Structural flood control measures, such as the case in the Philippines, are still in great demand and produce direct effects to the socio-economic activities in flood hazard areas.

These projects are the typical or conventional measures so far adopted to meet the demand of developing countries, and they promote economic development as well as the improvement of living conditions, further contributing to poverty alleviation. Moreover, structural flood control projects by riverbank improvement are getting uneconomical and unrealistic, considering the financial constraints in developing countries and also the resettlement issues involving many informal dwellers on the riverbanks due to the widening of river channels. Comprehensive flood control projects or the effective combination of structural and non-structural flood control measures should be proposed and implemented.

#### **6.4 CHALLENGE TO NEW TYPE OF FLOOD DISASTER MITIGATION METHOD**

There is a new point of view or trend, namely, the Integrated Small-Scale Flood Control and Poverty Alleviation Project like the case in Bangladesh. This trend focuses on poor people as the target and main participant, as well as the recipient, of the project.

The idea of flood mitigation that allows inundation to some extent but protects essential parts of livelihood is getting to be a more preferable solution to the increasing flood damages.

Key elements of these types of projects are: 1) participation of local people in order to establish the sense of ownership; and 2) assistance to the poor to enable them get out of the vicious cycle of widespread poverty by providing choices of means of livelihood.

Thus, it will be required to challenge a new type of integrated development plan, in both rural and urban

areas, that could handle poverty problems together with flood mitigation in the 21st century.

#### **6.5 REPORT OF WORKSHOP ON WATER AND POVERTY IN DHAKA**

The Asia-Pacific Regional Consultation Workshop on Water and Poverty was held in Dhaka, Bangladesh, on September 22-26, 2002.



**Figure-17 Workshop on Water and Poverty in Dhaka**

Some of the recommendations concerning poverty alleviation are listed below. These recommendations could be useful and adaptable to future flood control projects that aim to contribute to poverty alleviation.

- (1) Demand-driven approach should be provided for the poverty alleviation programs, where the poor themselves set the agenda and define the priorities.
- (2) Participatory approach is an agreed mechanism to make clear the needs, interests and priorities of the poor.
- (3) Partnerships are a key element for all stakeholders to play a role in poverty alleviation effectively.
- (4) Equity, with a gender focus, is the core of approach, both as an objective and as a key element of poverty alleviation.

- (5) Well-planned investment is a core component of required pro-poor actions.
  - (6) Development of institutional capacities is indispensable for the different needs and options that could be identified and turned into practical steps for the sustainable poverty reduction.
  - (7) Transparency of information and shared understanding are essential for creating partnerships and harmonizing the potentials of different stakeholders to the common purpose of decreasing poverty.
- (2) Structural measures in mitigating floods are effective in contributing to the enhancement of socio-economic conditions of people benefiting from the project. In order to obtain the maximum benefit on equitable and sustainable basis for the people, it is recommended to:
    - Adopt the comprehensive approach, integrating flood mitigation and management with water use and environmental conservation, and also combining hard and soft measures;
    - Adopt the basin approach with the whole basin as a unit even for international basins and involving all stakeholders.

## **6.6 REPORT OF WORKSHOP ON POVERTY AND FLOOD IN MANILA**

The Regional Consultation Workshop on Poverty and Floods was held in Manila, Philippines, on October 17 - 19, 2002.



**Figure-18 Workshop on Poverty and Flood in Manila**

Some of the findings and recommendations on poverty and floods are listed below.

- (1) Flood disaster is a fundamental problem in flood prone areas. Without proper flood mitigation and management, any effort on poverty reduction will not be successful.
- (3) In order to ensure flood mitigation and the management of projects to be more effective for poverty reduction, it is recommended to:
  - Incorporate social programs into the project as much as possible, or directly target the poor with poverty reduction as the primary objective of the project.
  - Give priority to poorer areas in the selection of project sites.
  - Carry out socio-economic studies in order to address poverty issues more effectively.
- (4) Other important issues mentioned particularly include the importance of information in various aspects, such as:
  - Information sharing among stakeholders and among countries in case of international river basins for cooperation in equitable water development and use. The proposed IFNet (International Flood Network) will surely contribute to flood damage mitigation through organizing cooperation among a wide range of

stakeholders all over the world.

- Information dissemination especially at the time of disaster emergency to the bottom level that need such information the most in an understandable way through the combination of IT technology and indigenous system.
- Flood hazard mapping, which is necessary as a prerequisite to all disaster management activities such as relief operation, preparedness and mitigation.
- Topics focused at the Bangladesh workshop such as participatory approach, partnership with all stakeholders, institutional and human capacity building, and gender consideration.

It was learned from the workshop that:

- (1) There is a tendency both in governments and donors that the approach of flood mitigation and management projects is shifting from the traditional one, which primarily aims at economic development of the target area, to a new one in which the project includes components in favor of or directly targeting the poor.
- (2) In spite of the success of flood mitigation and management projects in mitigating flood

disasters and in achieving economic development of target areas, poverty incidence has not always been reduced. This indicates that a flood mitigation and management project is a necessary condition but not a sufficient condition for poverty alleviation that is exacerbated by the continuous inflow of poor people into the target areas.

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## **7. CONCLUSION**

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The activities of JICA on flood disaster mitigation have been expanding from engineering measures, such as river improvement, to non-engineering measures, such as pro-poor development assistance. Considering the significance and magnitude of poverty issues in developing countries, coordinated activities among multilateral and bilateral agencies, private sectors, government agencies concerned, NGOs and local communities are needed. In this regard, JICA will further cooperate with these entities to assist developing countries in promoting their economic development, improving the living environment, and alleviating poverty.

This report is expected to serve as effective information for the Third World Water Forum in Kyoto, Japan.



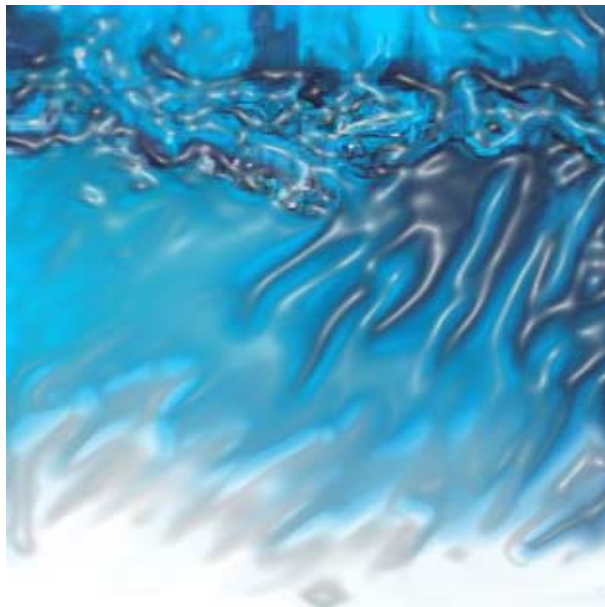
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## **(2) HANDOUT OF POVERTY AND FLOODS SESSION**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

SESSION INFORMATION  
セッションのご案内

# POVERTY AND FLOODS

## 貧困と洪水について考える!



Theme : Floods

テーマ : 洪水

Session : Poverty and Floods

セッション : 貧困と洪水

Time : 12:30-15:15, March 18

日時 : 3月18日  
12時30分～15時15分

Venue : Room D, Kyoto International  
Conference Hall

場所 : 京都国際会館 会議場 D

Convening Organizations : The Ministry of Land,  
Infrastructure and Transport,  
Japan (MLIT)

主催 : 国土交通省

Japan International  
Cooperation Agency (JICA)

国際協力事業団

Asian Development Bank  
(ADB)

アジア開発銀行



## Purpose 目的

The purpose of this session is to discuss appropriate means of reducing the vulnerability of the poor to the negative impacts of floods by drawing on lessons learned from international development cooperation in the Asian region.

このセッションでは、アジア地域における国際協力の事例を通じて、貧困層に対する洪水被害の適切な軽減方法について話し合います。

## Session Program セッションプログラム

Opening Remarks	12:30 – 12:40	開 会
Presentation of 5 Case Studies	12:40 – 14:00	事例発表
Panel Discussion on the theme of “Best practices to reduce the vulnerability of the poor to the negative impacts of floods”	14:00 – 14:30	パネルディスカッション
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Wrap-Up	15:00 – 15:15	閉 会

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川沿いに暮らす貧困層へ与えた大きな洪水被害の再発防止対策事業  
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– ヴェトナム国メコンデルタの事例



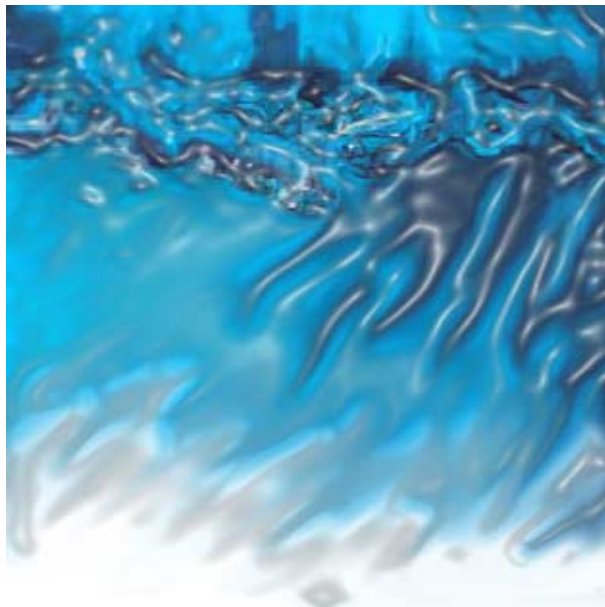
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### **(3) PHOTOS**

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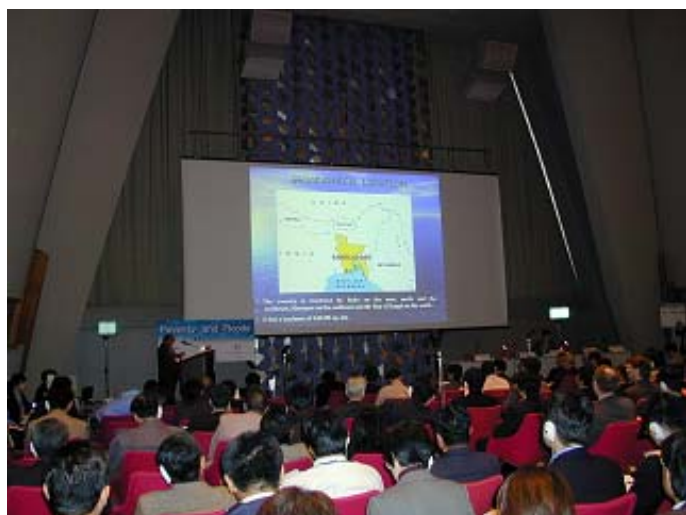
**THE SECONDARY WATER RESOURCES PROJECT STUDY**



**Photo- 1 Opening Remark by  
Chairman Hidetomi Oi**



**Photo- 2 Audience at Session 1**



**Photo- 3 Audience at Session 2**



**Photo- 4 Audience at Session 3**



**Photo- 5 Presentation of Case  
Stduy by Mr. Bernardo P.  
Aman**



**Photo- 6 Presentation of Case  
Stduy by Mr. Usman  
Rusfandi**



**Photo- 7 Presentation of Case  
Stdudy by Mr. Md  
Zahangir Alan**



**Photo- 8 Presentation of Case  
Stdudy by Mr. Jinchi  
Huang**



**Photo- 9 Presentation of Case  
Stdudy by Mr. Dang  
Quang Tinh**



**Photo- 10    Presentation of Case  
Stduy by Ms. Pham  
Thanh Hang**



**Photo- 11    General Discuession  
by Chairman  
Hidetomi Oi**



**Photo- 12    Presentation by Mr.  
Shun-ichi Maeda**



**Photo- 13    Presentation by Mr.  
Senichi Kimura**



**Photo- 14    Presentation by Mr.  
Ian B. Fox**



**Photo- 15    Presentation by Mr.  
Cheng Xiaotao**



**Photo- 16 Panel Discussion 1**



**Photo- 17 Panel Discussion 2**



**Photo- 18 Comment from  
Audience 1**



**Photo- 19    Comments from  
Audience 2**



**Photo- 20    Comments from  
Audience 3**



**Photo- 21    Comments from  
Audience 4**



**Photo- 22    Comments from  
Audience 5**



**Photo- 23    Discussion between  
Panellist and  
Audience**



**Photo- 24    Poster in front of  
Session Room**

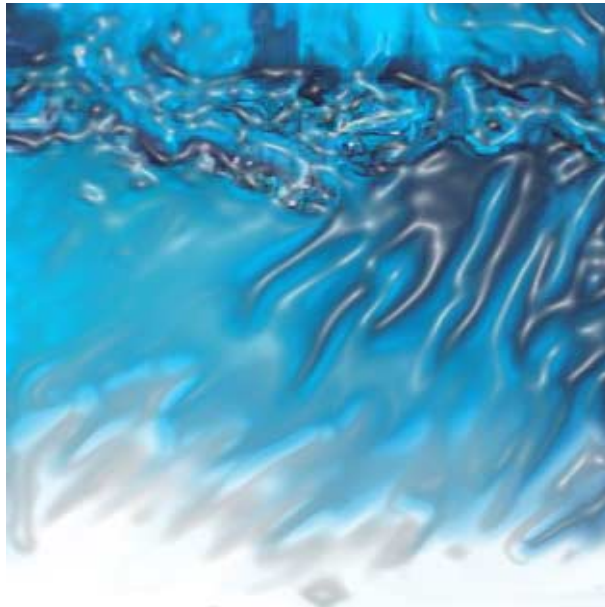
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## **(4) POSTER**

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**THE SECONDARY WATER RESOURCES PROJECT STUDY**

# POVERTY AND FLOODS

## 貧困と洪水について考える!



Theme : Floods

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Session : Poverty and Floods

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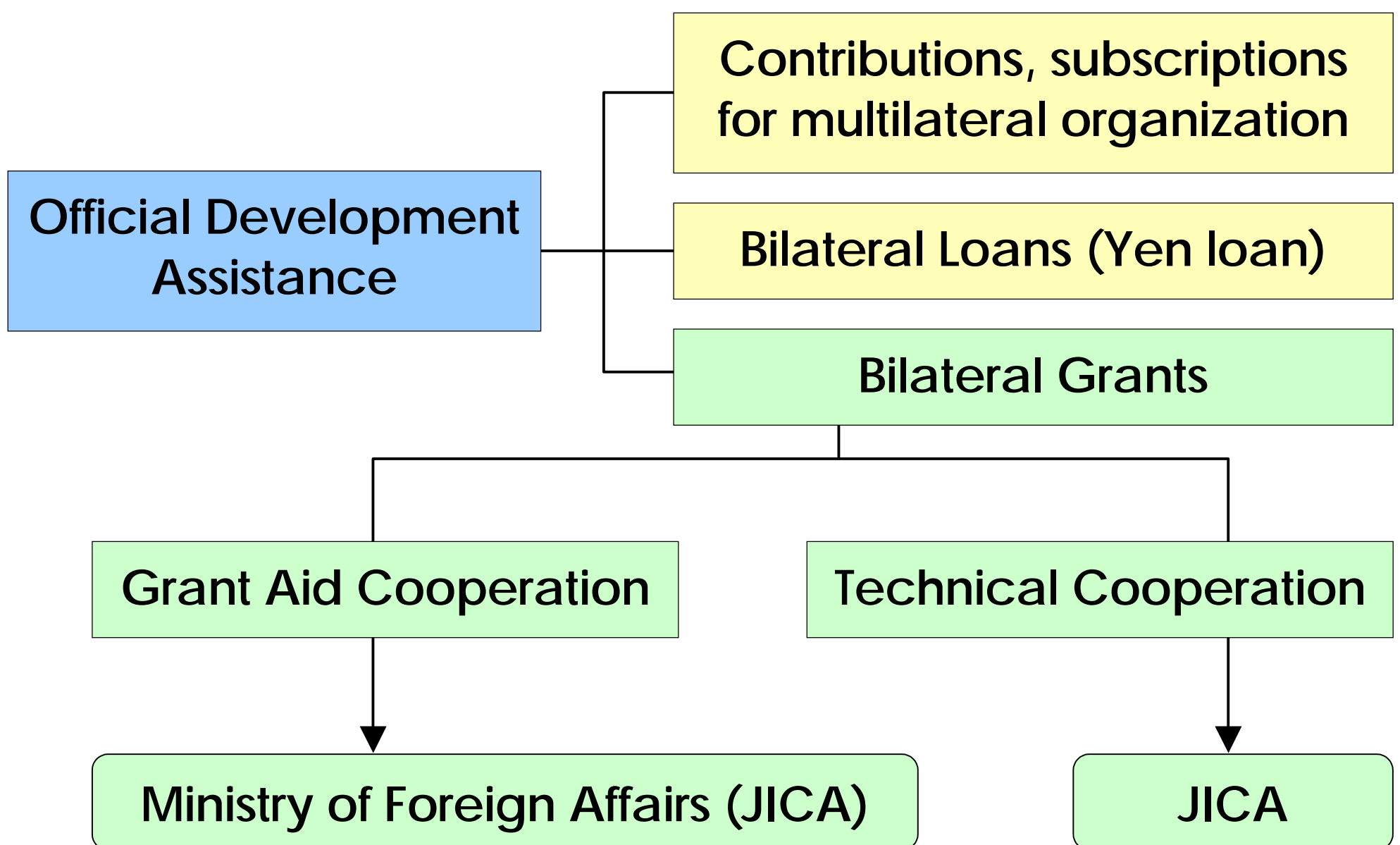


# ACTIVITIES OF JICA ON POVERTY ALLEVIATION AND FLOOD DISASTER MITIGATION



# RESPONSIBILITY OF JICA UNDER JAPAN'S ODA

Bilateral grants are mostly provided through the Japan International Cooperation Agency (JICA), which was established in 1974. JICA is responsible for the implementation of technical cooperation and the support for grant-aid cooperation programs of the Japanese Government.



## Responsibility of JICA under Japan's ODA

## POVERTY IN THE WORLD

There are 1.3 billion people living in poverty in the world at present. This translates to 1 person in 5 of the overall world's population, and 1 person in 3 in developing countries. Statistics compiled by the World Bank reveal that 520 million of these people are in Southeast Asia.

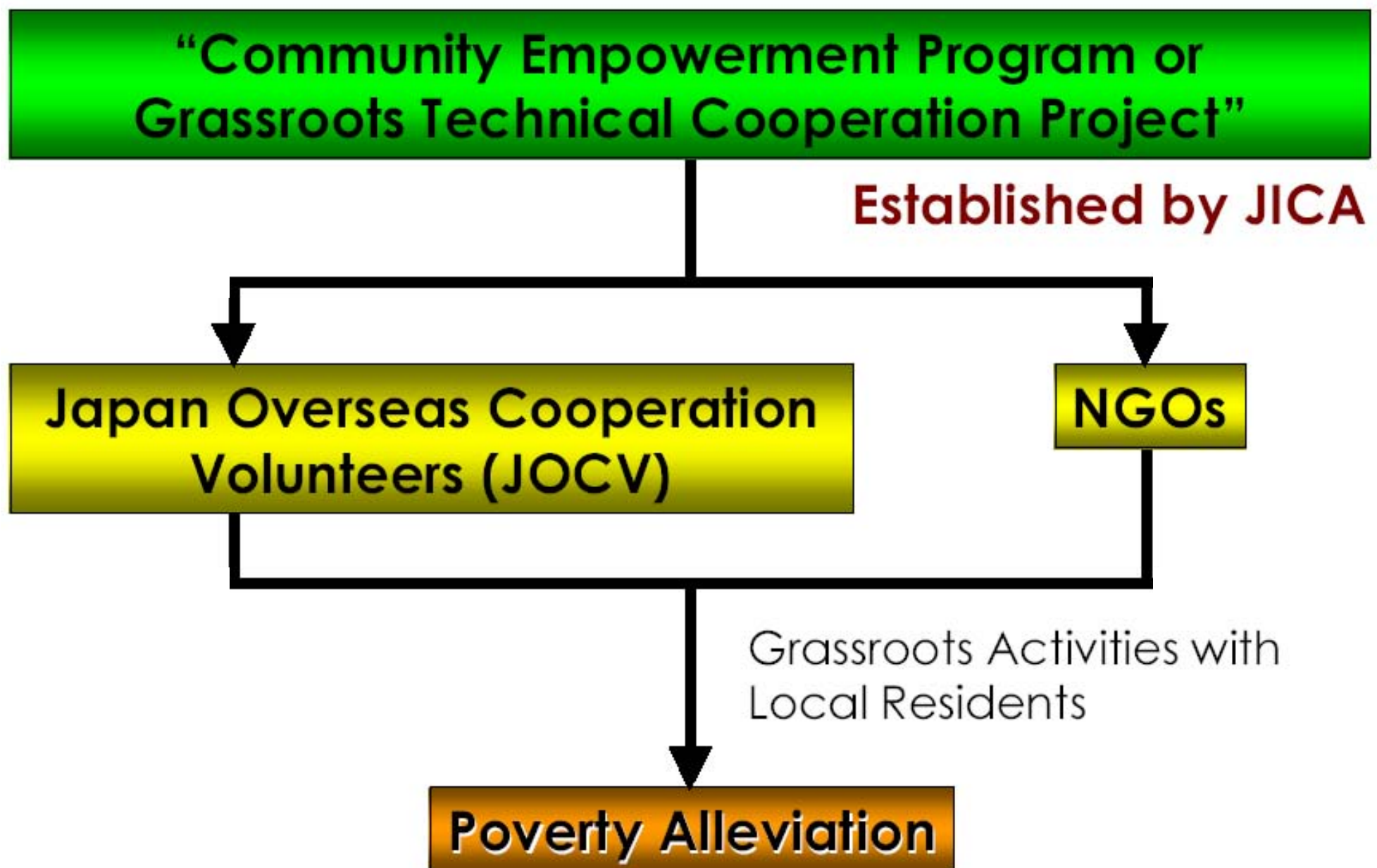


### Poverty Dwelling on Riverbank

## POVERTY ALLEVIATION BY JICA

Since the beginning of the 1990's, JICA has been conducting activities to support poverty reduction.

To promote its anti-poverty measures directly, JICA established the “Community Empowerment Program or Grassroots Technical Cooperation Project” in FY 1997 to serve as the framework of cooperation on poverty reduction to benefit the local residents.



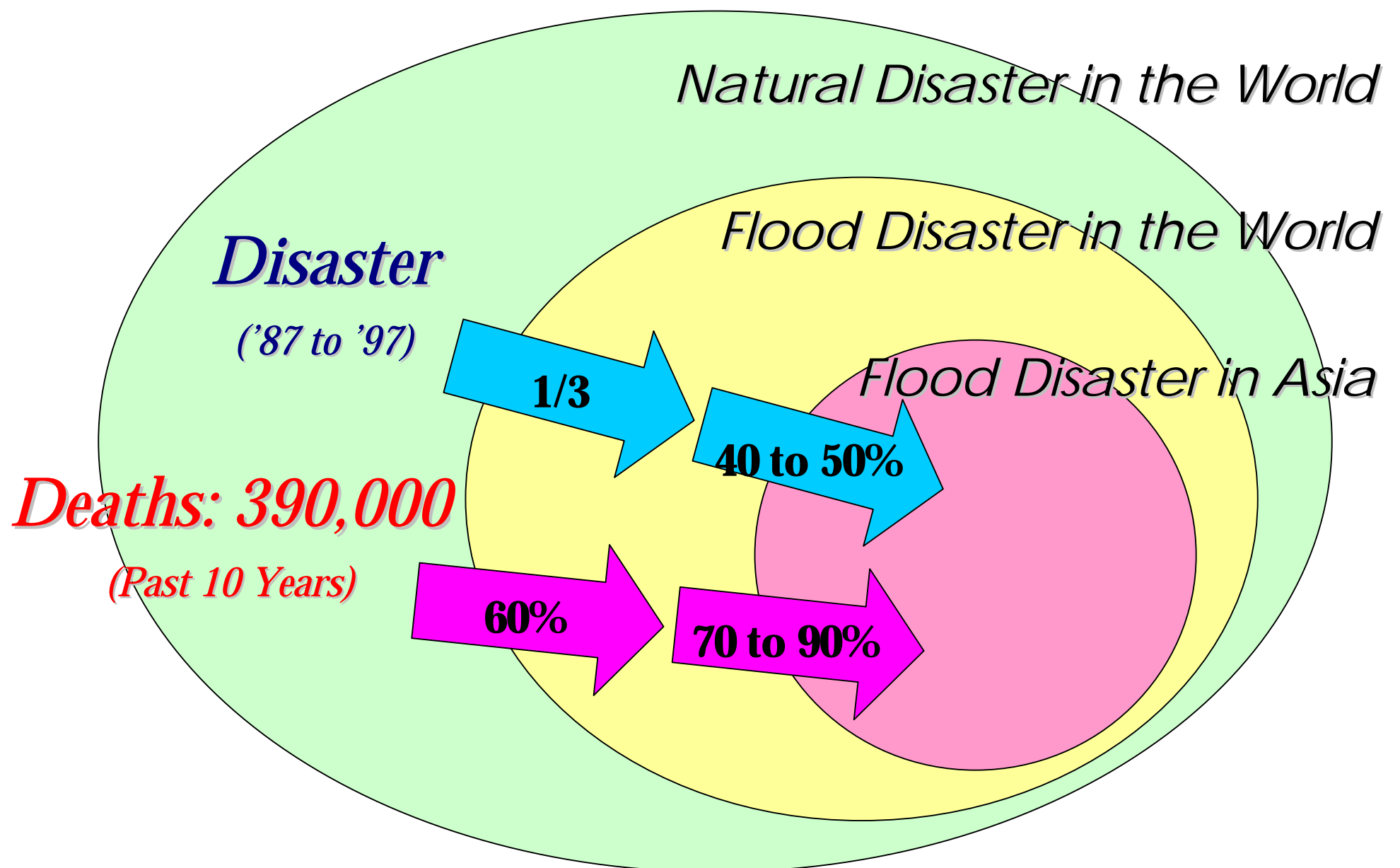
### Poverty Alleviation by JICA

## FLOOD DISASTERS IN THE WORLD

Flood disasters accounted for one-third of the natural disasters in the world in 1987-1997.

Death due to natural disasters has been estimated at about 390,000 for the past 10 years, and 60% of these were caused mainly by floods.

Socio-economic conditions, therefore, have suffered seriously from floods, and 40 to 50 percent of those floods and 70 to 90 percent of the dead had occurred in the Asian countries.



## Flood Disasters in the World

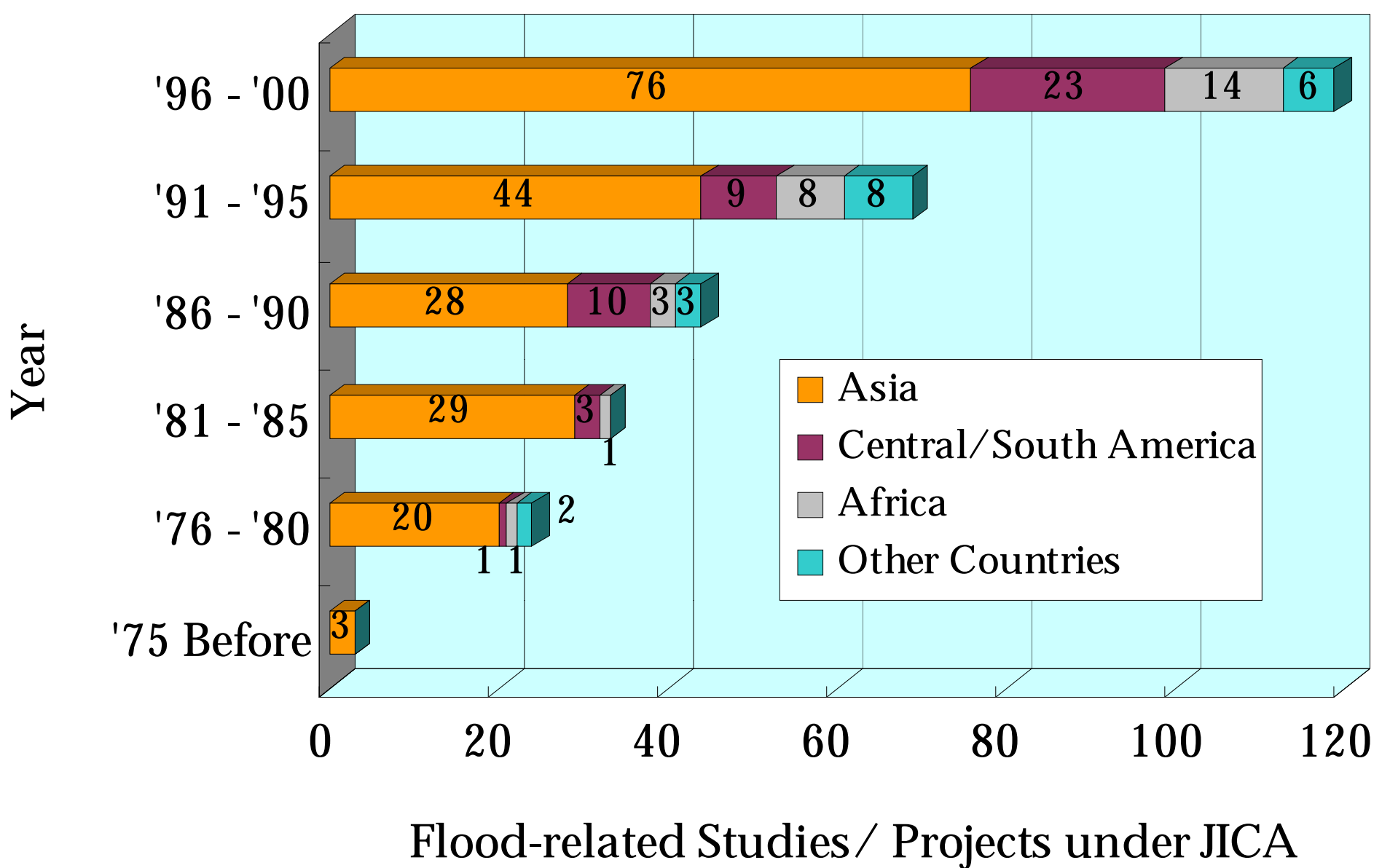


## Flood Disasters in the World

## FLOOD DISASTER MITIGATION BY JICA

Since 1974, JICA had carried out 292 flood-related studies/projects under the schemes of development study, support for the grant-aid program, and project-type technical cooperation.

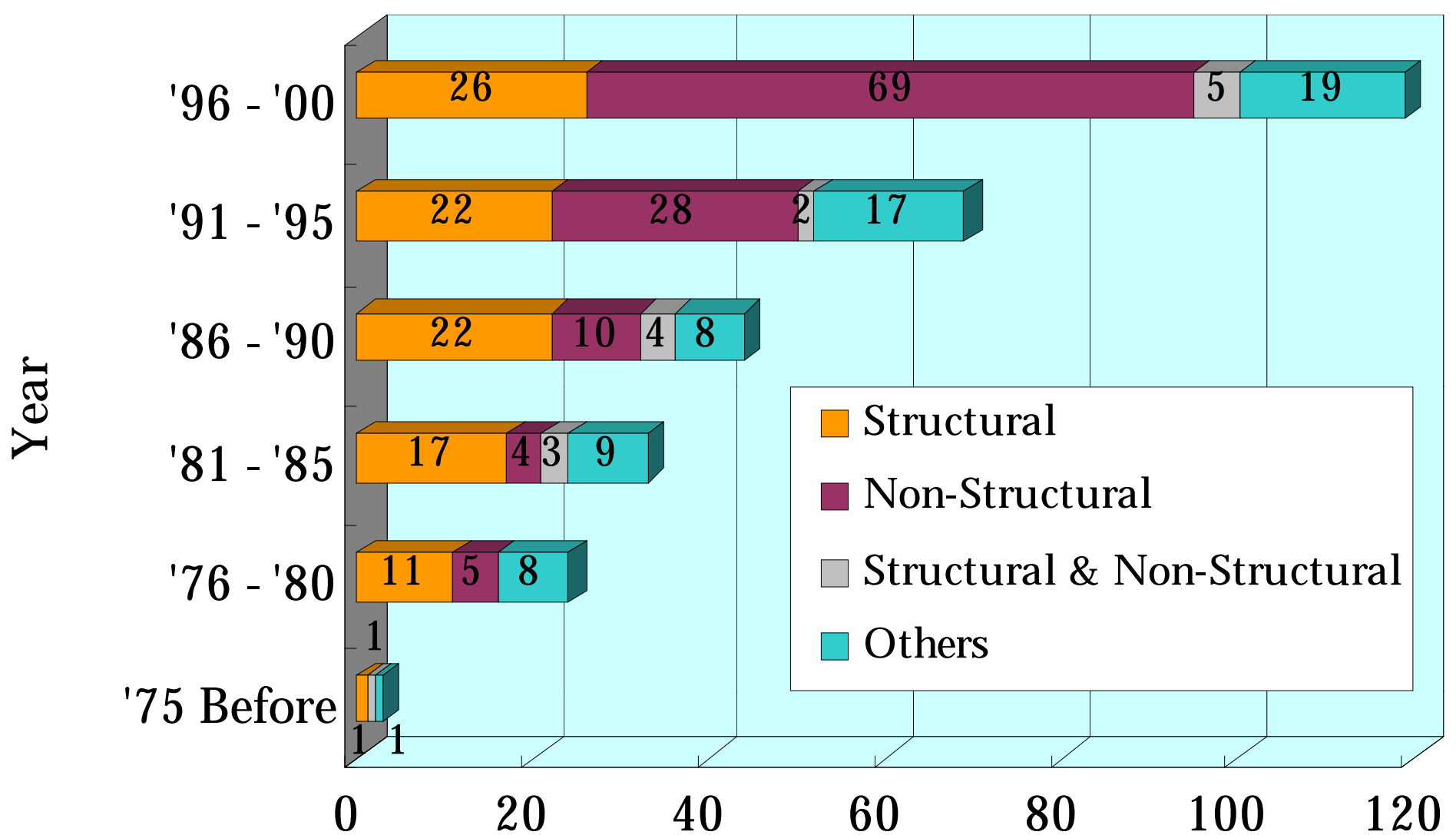
The 5-year trend presents a higher performance in Asia, while the schemes in Central/South America and Africa cover 30% in the latest 5 years from 1996 to 2000.



## Flood Disaster Mitigation by JICA

Non-structural flood control measures prevailed in the 1990's and they cover more than half of the flood-related projects recently implemented.

On the contrary, the annual average number of structural measures has not changed since the 1980's, so that the increase in the total number of projects is attributable to the increase of non-structural measures.



Classification of Flood Control Measure

## Trend of Non-Structural Flood Control Measures

# COMPREHENSIVE RIVER BASIN DEVELOPMENT WITH THE TECHNICAL ASSISTANCE OF JICA

The comprehensive river basin development project in Brantas, East Java, Indonesia, is a case of economic development.

The development projects consisted of river improvement works, irrigation systems, drainage systems and so on.



**Brantas River Basin**

The projects have produced benefits, such as the increase of safety level against floods to a 50-year return period, electricity production of about 1.0 billion kWh per year, irrigation of 340,000 hectares of land, raw water supply of around 300 million m<sup>3</sup> per year for drinking water and industries, tourism and so on.



**Lodoyo Irrigation Canal**

## POST-DISASTER RESTORATION PROJECT WITH THE ASSISTANCE OF JICA

The flood control project in Ormoc City in the province of Leyte, Philippines, is a typical case of a post-disaster restoration project.

The project's objective was to develop the area by providing protection against floods larger than the one that took place in Ormoc in November 1991 accounting for 8,000 deaths and missing.



**Flood Situation in Ormoc City**

The residents of Ormoc are now relieved from the threat of flood disaster and this contributes to the development of the regional economy.



## Post River Improvement in Ormoc City

# **FLOOD DISASTER MITIGATION FOCUSING ON POVERTY WITH THE TECHNICAL ASSISTANCE OF JICA**

Flood is a recurring phenomenon in Bangladesh. People in that country practically live with floods. Since farmers have no other means of livelihood apart from farming, they are very vulnerable to flood damage.

JICA study team formulated an integrated rural development plan, targeting small-scale flood mitigation and poverty alleviation.



## **Flood Disaster Mitigation Focusing on Poverty in Bangladesh**

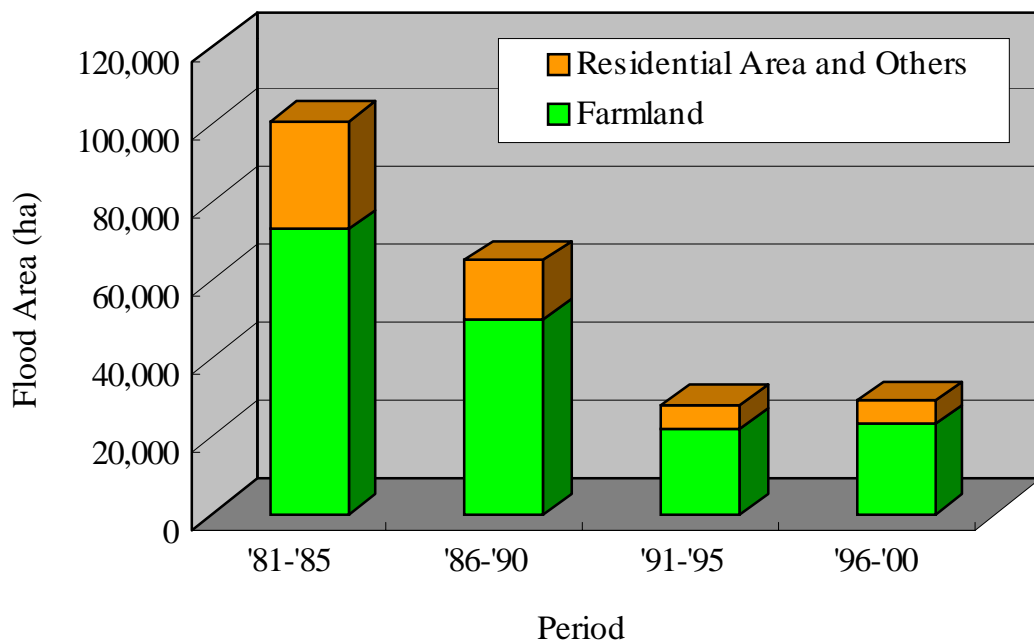
Furthermore, to ensure the sustainability of the proposed projects, participatory approach, self-managed savings and credit programs, cost-sharing and institutional building were proposed.



## **Participatory Approach in Rural Development Projects in Bangladesh**

## FLOOD CONTROL IN JAPAN

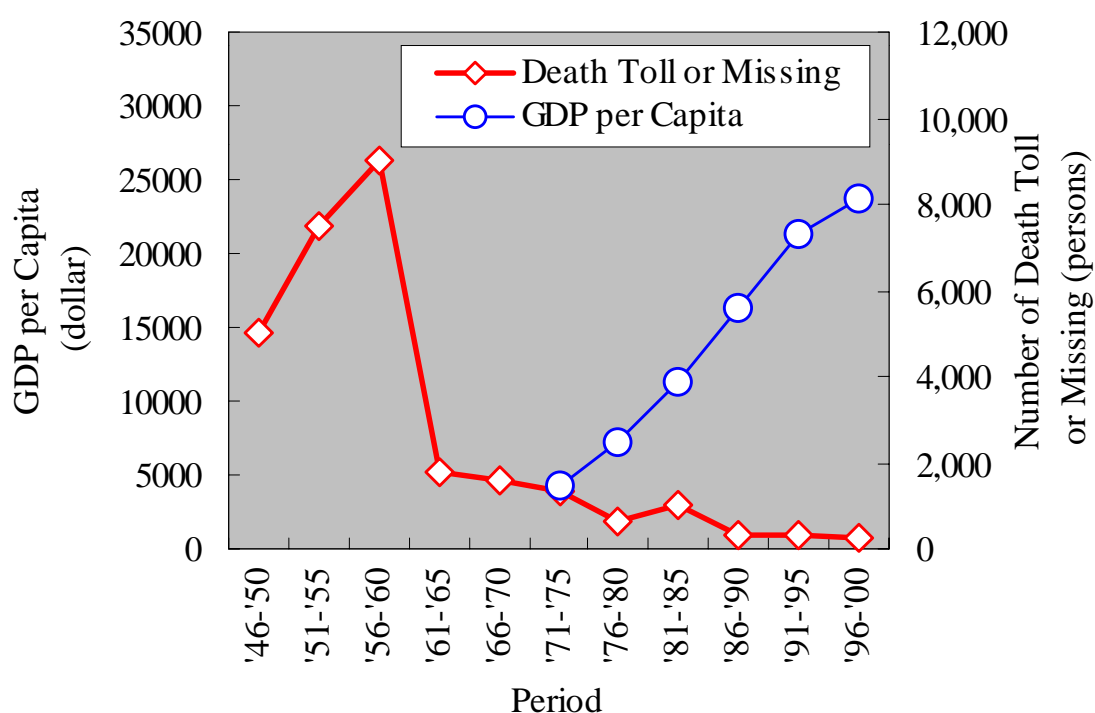
The flooded areas in Japan have been decreasing in every 5 years because flood control projects were implemented.



### Trend of Flood Area in Japan

The figure bellow shows the 5-year trend of Number of Missing and Deaths and Gross Domestic Product (GDP) per Capita in US dollars.

The number of deaths or missing due to floods has been decreasing since 1960 because of the serious efforts on flood control. The flood control projects have contributed to the stability of livelihood and socio-economic development, which caused the increase of GDP per Capita from 1970.



### Trend of Number of Deaths or Missing and GDP per Capita in Japan

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