

Flood Mapping have been and are being initiated at the MRC Secretariat in the Technical Support Division since 1997. This activity will be latter on carried out by the Regional Flood Management and Mitigation Center.

1. Regional Flood Management and Mitigation Center

1.2 Improved forecasting tools

| Outputs | Activities and tasks |
|---|--|
| 1.2.1 Improved operational forecasting | 1.2.1.1 Implementation of improved operational forecasting: (i) Review; (ii) reducing uncertainties; (iii) increasing the lead time; (iv) increasing the accuracy; (v) improvement of modelling system; (vi) links to national forecasting 1.2.1.2 Flash flood forecasting 1.2.1.3 National implementation support: (i) Local models in pilot areas; (ii) common standards |
| 1.2.2 Improved warning and dissemination services | 1.2.2.1 Early warning to flood-vulnerable communities (OFDA pilot project) 1.2.2.2 Improved warning and dissemination services (general): (i) Expand warnings; (ii) links to national flood warnings; (iii) improve understanding of warnings; (iv) improve dissemination; (v) Internet dissemination |
| 1.2.3 Medium and long term forecasts | 1.2.3.1 Development of medium and long term forecast tools: (i) Review; (ii) development of forecasts |
| 1.2.4 Risk assessment tools | 1.2.4.1 Development of risk assessment tools: (i) Review of experience; (ii) requirements and specifications; (iii) tools development and implementation; (iv) workshops |

1.3 Flood management services

| Outputs | Activities and tasks |
|---|---|
| 1.3.1 RFMMC implemented in accordance with agreed scope, in a close interaction between the MRC member countries, and in a continuous dialogue with partners and stakeholders | 1.3.1.1 RFMMC management |
| 1.3.2 Basic data | 1.3.2.1 Basic data acquisition and management: (i) data compilation; (ii) review and gap-filling |
| 1.3.3 Improved monitoring | 1.3.3.1 Improved monitoring routines: (i) Review; (ii) flood database; (iii) satellite-based weather information; (iv) strengthening regional network; (v) |

strengthening national networks

- | | |
|--|--|
| 1.3.4 Flood risk analyses and maps | 1.3.4.1 Flood risk analysis and mapping: (i) Agreed indicators; (ii) hindcast studies; (iii) parameter study of critical events; (iv) statistical analysis; (v) flood risk mapping; (vi) <i>flood risk impact assessment</i> |
| 1.3.5 Related competence | 1.3.5.1 General capacity-building and liaison: (i) Professional liaison; (ii) capacity building 1.3.5.2 DIPECHO capacity-building programme 1.3.5.3 Pilot study: Environmental benefits of floods (with WWF) 1.3.5.4 Ad hoc services to other MRC programmes |
| 1.3.6 Forecasts & monitoring routines consolidated | 1.3.6.1 Flood forecasting and dry season monitoring (consolidation of routine operation) |
| 1.3.7 Annual Flood Forums and regional networking | 1.3.7.1 Annual Flood Forums and regional networking: (i) Organise and report annual flood forums; (ii) build and maintain a professional network of FMM practitioners and scientists in the LMB; (iii) facilitate/foster FMM-related knowledge-sharing |

2 FMMP Implementation Plan (structural measures and flood proofing)

2.1 Preparation of the FMMP Implementation Plan

| Outputs | Activities and tasks |
|--|---|
| 2.1.1 Characteristics of Mekong River Basin floods | 2.1.1.1 BDP strategy for flood management |
| | 2.1.1.2 Review data about Mekong River floods |
| | 2.1.1.3 Update existing maps, ensure compatibility with present needs |
| | 2.1.1.4 Analyses of historic floods and their impacts (to complement risk assessment under FMMP Component 1) |
| 2.1.2 Flood proofing measures | 2.1.2.1 Beneficial impacts of floods (environmental, social, and economic aspects) |
| | 2.1.2.2 Benefits of flood proofing and other soft measures |
| | 2.1.2.3 Socio-economic surveys of flood-affected communities |
| | 2.1.2.4 Evaluate traditional coping mechanisms |
| | 2.1.2.5 Undertake flood damage vulnerability analyses |
| | 2.1.2.6 Develop guidelines for best practices in flood proofing |
| 2.1.3 Potential for structural interventions | 2.1.3.1 Inventory of existing & planned structures |
| | 2.1.3.2 Nature and extent of the impacts of structures |
| | 2.1.3.3 Review operating rules for major hydraulic structures |
| | 2.1.3.4 National practices in relation to dams, reservoirs, major flood control works, etc. |
| | 2.1.3.5 Risk analysis and potential impacts of structures |
| | 2.1.3.6 Develop guidelines for best design practices |
| 2.1.4 FMMP Implementation Plan | 2.1.4.1 Review national flood management strategies |
| | 2.1.4.2 Determine flood management constraints and opportunities encapsulated in the BDP, EP, WUP |
| | 2.1.4.3 Sub-basin flood management development programs |
| | 2.1.4.4 Appropriate design standards and guidelines for integrated structural and nonstructural flood management measures |
| | 2.1.4.5 Determine trans-boundary and cumulative impacts of various measures in isolation and in combination. |
| | 2.1.4.6 Prepare an implementation plan |
| | 2.1.4.7 Overall implementation schedule |
| 2.1.5 Sub-basin implementation plan components | 2.1.5.1 Intervention programs |
| | 2.1.5.2 Cost sharing arrangements |

2 FMMP Implementation Plan (structural measures and flood proofing)

2.2 Management capacity for implementation planning

| Outputs | Activities and tasks |
|--|--|
| 2.2.1 Capacity for consultation and consensus building | 2.2.1.1 Mechanisms for coordination with other programs. |
| | 2.2.1.2 Stakeholder participation process |
| | 2.2.1.3 National and regional consultation workshops |
| | 2.2.1.4 Public awareness campaigns |
| 2.2.2 Training programmes | 2.2.1.2 Structured on-the-job training |
| | 2.2.2.2 Staff training in technical, environmental, and social aspects |
| | 2.2.2.3 Programs for training at regional education centres |
| | 2.2.2.4 Formal in-country training |

3 Trans-boundary mediation

3.1 MRCS Trans-boundary Mediation and Coordination Sub-component

| Outputs | Activities and tasks |
|---|--|
| 3.1.1 A Trans-boundary Mediation and Coordination Sub-component | 3.1.1.1 Establishment of a Trans-boundary Mediation and Coordination Sub-component: (i) Formulation of mandate and framework; (ii) development of regional partnerships; (iii) establishment of a Trans-boundary Mediation and Coordination Sub-component |
| | 3.1.1.2 Consolidation of operation of the Trans-boundary Mediation and Coordination Sub-component |
| 3.1.2 Facilitation and mediation tools | 3.1.2.1 Development of facilitation and mediation tools: (i) Trans-boundary land management and land-use planning; (ii) trans-boundary impacts of structural measures; (iii) trans-boundary flood emergency management |
| 3.1.3 Related competence | 3.1.3.1 Capacity-building in trans-boundary mediation and coordination: (i) Organisation of institutional and legislative forums; (ii) literature studies; (iii) training; (iv) evaluation |

3 Trans-boundary mediation

3.2 FMM Coordination

| Outputs | Activities and tasks |
|--|--|
| 3.2.1 FMMP implemented in accordance with agreed scope, in a close interaction between the MRC member countries, and in a continuous dialogue with partners and stakeholders | 3.2.1.1 Coordination at MRCS 3.2.1.2 Coordination at CNMC 3.2.1.3 Coordination at LNMC 3.2.1.4 Coordination at TNMC 3.2.1.5 Coordination at VNMC |
| | (Note: These activities may conveniently be sub-divided into one activity for each year) |

3 Trans-boundary mediation

3.3 Pilot projects

| Outputs | Activities and tasks |
|--|---|
| 3.3.1 Pilot project(s) and recommendations | 3.3.1.1 Trans-boundary flood management pilot project(s): (i) pilot projects; (ii) related suggestions on institutional implications; (iii) recommendations on trans-boundary emergency management; (iv) recommendations on water and land use legislation |

4 Emergency management strengthening

| Outputs | Activities and tasks |
|---|--|
| 4.1 Implementation of flood preparedness programs in selected provinces and districts | 4.1.1 Training courses for selected provinces and districts |
| | 4.1.2 Distribute guidelines, maps and forecasts |
| | 4.1.3 Strengthen the capacity of PCDM/DCCDM offices |
| | 4.1.4 Support to flood preparedness programs |
| | 4.1.5 Distribution of program documents to districts and communes |
| | 4.1.6 Priority sub-projects and local level training courses |
| | 4.1.7 Improved management of stockpiles and warehouses |
| | 4.1.8 Training of commune leaders |
| | 4.1.9 Support mobilization of funds for implementation |
| 4.2 National capacity within preparedness programs | 4.2.1 National guidelines / manuals |
| | 4.2.2 Transfer of training course to national agencies |
| | 4.2.3 Develop institutional capacity in flood preparedness |
| 4.3 Awareness campaigns in selected provinces and districts | 4.3.1 Adapt & republish booklets and posters for children and adults |
| | 4.3.2 Promote the film – “Living with floods” |
| | 4.3.3 Training for children |
| 4.4 Regional knowledge sharing | 4.4.1 Organize 2 regional workshops |
| | 4.4.2 Prepare and circulate good practice documents |
| | 4.4.3 Organize 2 study tours to other riparian countries |
| 4.5 Preparedness for trans-boundary emergency assistance | 4.5.1 Support cooperation on a pilot basis |
| | 4.5.2 Facilitate trans-boundary emergency preparedness tools |

5 Land use management

| Outputs | Activities and tasks |
|---|--|
| 5.1 Regional knowledge-sharing | 5.1.1 Analyses and reviews of practices and methodologies |
| | 5.1.2 National and regional workshop |
| | 5.1.3 Recommendations on good practices |
| 5.2 Flood risk information for land information systems in selected districts and provinces | 5.2.1 Liaise with risk assessment activities under Component 1 |
| | 5.2.2 Workshops on geodetic networks and topographic data |
| | 5.2.3 Acquire topographic data sets from selected areas |
| | 5.2.4 Procure laser profiling |
| | 5.2.5 Compile flood hazard data sets and maps |
| | 5.2.6 Organize a workshop to share experiences |

| | |
|--|--|
| 5.3 Capacity to prepare and implement land use plans in selected provinces and districts | 5.3.1 Guidelines and training modules |
| | 5.3.2 Training on "integrated flood hazard plans" |
| | 5.3.3 Training of trainers on community-based flood hazard mapping |
| | 5.3.4 Demonstrate preparation of 'flood hazard maps' |
| | 5.3.5 National workshop on flood hazard plans (1 per country) |
| | 5.3.6 Establish open access databank on flood hazard mapping |

Preliminary survey team
For
The Regional-Focused Training Course in “Flood Hazard Mapping”

- A. Explanation...
- B. Outline of Lao policy/countermeasures for Flood prevention/Mitigation (legal system, organization structure, budget, projects under taken-past and present, etc.)

Legal system /Lao policy

According to the Article 3, Point 2 of the Decree of the Prime Minister for implementing of the “Water and Water Resource Law”, the Ministry of Communication, Transport, Post and Construction responsible for flood protection in the urban/city areas. The Ministry of Agriculture and Forestry responsible for flood protection in the agriculture land.

Countermeasures for Flood prevention:

- a). *Strategy*
- Communities, social and economic safety and reduce of damages from natural and man made disaster, secure for sustainable development
 - Approval of strategy from flood relief and flood recovery become flood preparedness.
 - Flood preparedness in the past response by government agencies now change to community response.
 - *Promotion and protection of the environmental and natural resources.*
- b). *Implementation*
- Extend of flood management network from center down to local level.
 - Establish focus point and identify contact person on flood management.
 - Establish and improve the regulation for flood preparedness.
 - Establish of effective early warning system and information/ data collection.
 - Prepare stock or place/areas where can keep food and basic need.
 - Training for communities about cause and effect of flood.
 - Training for government staff and private sectors about flood management.
 - Establish flood rescue and quick response teams.
 - Set up data center and data exchange.
 - Organize a demonstration/ practice on flood rescue.
 - *Link or combine the flood management project with development activities.*
 - Monitoring of the implementation of the management laws: forestry, land use, water recourse and natural disasters.
 - Monitoring and control of the implementation of the regulations import on hazardous material.

- Strengthening of the cooperation in the region for flood management.
- Support and coordinate with government sectors to cope flood management activities with their works.

Organization structure

For implementing the mentioned Law the Government created a National Disaster Management Committee to coordinate the national effort of assessment and flood response.

| | |
|--|---------------|
| ▪ Minister of Labuor and Social Welfare (MLSW) | Chairman |
| ▪ Vice Minister of Agriculture and Forestry (MAF) | Vice chairman |
| ▪ Chief of Cabinet, Ministry of Foreign Affaire (MFA) | Member |
| ▪ Chief of Cabinet, Ministry of Defense (MOD) | Member |
| ▪ Chief of Cabinet, Ministry of Security (MOS) | Member |
| ▪ Director of Budget Department, Ministry of Finance | Member |
| ▪ Director of Transport Department, Ministry of Communication Transport Post and Construction. | Member |
| ▪ Director of Industry Department, Ministry of Industry and Handicraft | Member |
| ▪ Director of Hygiene and Prevention Department, Ministry Public Health | Member |
| ▪ Director of Mass Media Department, Ministry of Information and Culture. | Member |
| ▪ Chief of Cabinet, Ministry of Education | Member |
| ▪ Chairman of Lao Red Cross Society | Member |
| ▪ Director of Social Welfare Department, MLSW | Member |

Flood prevention/Mitigation

Non-structural measures

The Waterways Administration Division (WAD), Department of Roads, the Ministry of Communication Transport Post and Construction has been carried out the main task for flood forecasting and warning it is daily data collection of water level and rainfall, data forward to MRCS for statistic record and for flood forecasting and warning in the raining season.

WAD responsible for installing and operating of 64 hydrological stations and 23 rainfall stations.

Structural measures

Construction and maintenance of flood protection dikes, water gates and drainage canals. Until now 72 km flood protection dike along the Mekong River in Vientiane City has constructed, 2.5 km in Paksane town and 2.5 km in Pakse town. Completed 16.612 km drainage canal in Vientiane City and constructed of 2 water gates in Vientiane City, 3 in Paksane town, 3 in Pakse town, 2 in Savannakhet town and 4 in Thakhek town.

Budget

a). National budget

64 hydrological stations and 23 rainfall stations.

Bank protection

b). ADB

Vientiane City

Drainage canal

Phase I: 5 mil US\$ (completed)

Phase II: 6 mil US\$

Secondary towns development project (ADB)

Pakse town:

Flood protection dike 2500 m along the Mekong River.

Water gates: 3 gates

Savannakhet town:

Water gates: 2 gates

Paksane town:

Flood protection dike 2500 m along the Mekong River.

Water gates: 3 gates

Thakhek town:

Water gates: 4 gates

c). Provincial budget

Non

Projects under taken-past and present

Vientiane City (ADB project)

Drainage canal

Phase I: 5 mil US\$ (completed)

Phase II: 6 mil US\$

Pakse town:

Flood protection dike 2500 m along the Mekong River.

Water gates: 3 gates

C. Situation of flood occurrence (damages, countermeasures after flood-after survey, recovery works, etc.) in Lao PDR

Flood occurrence:

Main flood occurred in Laos: 1961, 1966, 1971, 1978, 1984, 1995 and 2002.

Damages:

(See annexes)

Countermeasures after flood:

Urgent restoration of critical infrastructures (flood protection dike, water gates, drainage canal, flood pumping station).

Assessment of losses.

Recovery works

Revise and propose to Government, the tasks, framework, organization, budget, condition, contributions and responsibilities to improve the production, settlement of farmers and repairs of schools, hospitals and roads. Also to improve the commercial economy and livelihood of the farmers. At the same time, set a plan to prevent flood in the long term.

Provide central cooperation, advising between sectors and the local provision of relief and flood damage assessment.

Cooperate with the Government units involved with requesting contributions from within the country and internationally.

Always report to Government about the progress of the work.

D. Lao System for Warning and Evacuation on Flood (observation, forecasting, warning, roles of central, local government and communities, etc.)

Observation

Before rainy season come, we sent observation team to the inundation area for checking the flood protection dike, drainage canal, water gauge, and floodwater pumping station

Forecasting

Flood forecasting and warning has been mainly dealt with on a national basis. The Waterways Administration Division (WAD) and River Work Units under Communication Transport Post and Construction Division in the provinces along the Mekong river carried out daily data collection of water level and rainfall then data forward to MRCS, by using software SARRAD Model the information call forecasted water level has sent back to WAD and concerning agencies.

Warning

The flood warning system and dissemination mainly used telephone, e-mail, fax, television, radio, newspaper, etc

Roles of central

- Issued Water and Water Resource Law dated 11 October 1996.
- Issued Decree for Implementing of Water and Water Resource Law dated 9 October 2001.
- Set up Steering committee for Flood Relief dated 11 September 1995.
- Set up National Disaster Management Committee dated 23 August 1999.
- Flood forecasting and dissemination to local governments and humanitarian organizations.
- Seeking fund for improvement Non-Structure and Structure
- Flood forecasting.

- Flood warning.
- Declare the local area affected by the flood.
- Conduct the survey
- Report the flood-related damage
- Relief requirement.
- Provide central cooperation, advising between sectors and the local provision of relief and flood damage assessment

Local government and communities (Warning and Evacuation)

- Set up the Provincial the Relief Committee.
- Preparation and implementation of flood preparedness plan.
- Clear statement of roles and responsibilities within the government, and delegated to humanitarian organizations.
- Review and revise flood preparedness plans regularly as appropriate.
- Dissemination of warning based on forecast.
- Identify, organize and maintain flood safe areas.
- Provide water source at flood safe area and appropriate sanitation.
- Prepare to provide temporary shelters, relief and basic medical services.
- Understand and use formats for rapid need assessment.
- Identify key sources/humanitarian organizations that will assist in relief and coordinate with them.
- Preparing for search and rescue
- Arrange logistics and transport to safe areas.
- Receive information of water level and rainfall data from central level (WAD)
- Dissemination of information to the inundation areas.
- Set up evacuation plan.
- Worked in flood preparedness and mitigation in the local area
- Flood watch
- Declare to local communities that affect by flood.

E. Present situation of preparing Flood Hazard Mapping in Lao PDR

In Laos the flood hazard map for the main urban/cities as well as small not existed due to lack of knowledge, experience, technology and budget. The flood management mostly focused on activities as mentioned above.

F. Present situation of research and human resources development by the Lao organization concerned

Non

G. Result of the survey on Lao local residents for flood (how people encounter flood- evacuation, obtain information, problems incurred by flood, etc.)

How people encounter flood-evacuation.

- Lack of Transportation

- Limited of basic supplies during flood.
- Not enough of temporary shelter.
- Limited of medical needs
- No school, kinder garden

Obtain information

- Information obtains from Provincial and District Disaster Management Committee.
- Information from Hydro-met office.
- Information from Mass organization at provincial level. (Radio, television, telephone)
- NGOs working in flood preparedness and mitigation at the target provinces.

Problems incurred by flood

Negative:

- Poor living condition, no electricity, no clean water for drinking, no medical care, no school, no sanitations
- Lost of irrigation scheme.
- Infrastructure damaged.

Positive

- Cultivate land fertilized.
- Some fish species need flood water.

H. Comment, Advice, suggestion, expectation, and etc. to the JICA's Course (general information, selection of the candidates, after use of the training results, etc.)

- Insufficient of data collection due to poor network and budget constrain.
- No tools/soft ware for flood forecasting.
- Difficulty disseminates information to local communities.
- Local communities have difficulty to obtain information from Central and Provincial Authorities.
- Local communities have difficulty to access to the mass media.
- No concrete plan from central to the village level for preventing the flood.
- No GIS map for each inundation area.
- No Flood Hazard map.
- Relief provision delay and insufficient.

I. Others

- Long term flood preparedness planning.
- Technical assistance.
- Need master plan.
- Need flood hazard map.
- Training.

**List of Natural Disaster in LAO PDR
1966 – 1998**

| Year | Type of Damage | Damage Cost (US\$) | Location Damage |
|------|---------------------------------|---|------------------------------|
| 1966 | Large flood | 13,800,000 | Central |
| 1967 | Drought | 5,200,000 | Central and Southern |
| 1968 | Flood | 2,830,000 | Southern |
| 1969 | Flood | 1,020,000 | Central |
| 1970 | Flood | 30,000 | Central |
| 1971 | Large flood | 3,573,000 | Central |
| 1972 | Flood and Drought | 40,000 | |
| 1973 | Flood | 3,700,000 | Central |
| | Flood | 180,000 | Southern |
| 1975 | Drought | Not available | |
| 1976 | Flash Flood | 9,000,000 | |
| 1977 | Sever Drought | 15,000,000 | |
| 1978 | Large flood | 5,700,000 | |
| 1979 | Flood and Drought | 3,600,000 | |
| 1980 | Flood | 3,000,000 | Central |
| 1981 | Flood | 682,000 | Central |
| 1982 | Drought | Not available | |
| 1983 | Flood and Drought | 50% below normal production levels | |
| 1984 | Flood | 3,430,000 | |
| 1985 | Flash Flood | 1,000,000 | Oudomxay |
| 1986 | Flood and Drought | 2,000,000 | |
| 1987 | Drought | 5,000,000 | Central and Northern |
| 1988 | Drought | Crop losses of 40,000,000 reduction in Electricity production (Hydro) | Southern |
| 1989 | Drought | 20,000,000 | Southern |
| 1990 | Flood | 100,000 | Central |
| 1991 | Flood and Drought | 3,650,000 | Central |
| 1992 | Flood, Forest fires and Drought | 302,151,200 | Central, Northern |
| 1993 | Flood and Drought | 21,827,927 | Central, Southern |
| 1994 | Flood | 21,152,400 | Central, Southern |
| 1995 | Large Flood | 33,000,000 | Central, Southern |
| 1996 | Flood | 10,500,000 | Central Region |
| 1997 | Flood and Drought | 1,860,300 | Southern, Region |
| 1998 | Drought | 5,762,715 | Northern and Southern region |

Source : Technical Management Division, Department of Meteorology and hydrology, MAF

**List of natural disaster in Lao PDR
Year 2000**

| No | Provinces | Population | | | Rice field flooded | | | Remark |
|----|-------------------|------------------|-----------------|-------------|--------------------|---------------|---------------|-----------|
| | | Total | Victim's people | Percentage | Total rice field | Flooded | damaged | |
| 1 | Phongsaly | 170,100 | 670 | 0 | 5,400 | 30 | 20 | 0 |
| 2 | Vientiane | 318,900 | 0 | 0 | 38,010 | 960 | 350 | 1 |
| 3 | Vientiane Munic.. | 583,300 | 10,350 | 2 | 51,930 | 3,650 | 1,290 | 3 |
| 4 | Bolikhamxay | 182,000 | 19,400 | 11 | 25,280 | 3,710 | 250 | 1 |
| 5 | Khammouane | 303,200 | 125,360 | 41 | 48,230 | 23,640 | 14,000 | 29 |
| 6 | Savannakhet | 747,600 | 96,460 | 13 | 114,650 | 23,700 | 12,460 | 11 |
| 7 | Saravan | 285,100 | 16,500 | 6 | 47,680 | 4,740 | 1,400 | 3 |
| 8 | Champasack | 558,000 | 117,940 | 21 | 83,190 | 22,730 | 12,060 | 15 |
| 9 | Attapu | 97,100 | 12,080 | 12 | 13,500 | 1,930 | 1,070 | 8 |
| | Total | 3,245,300 | 398,760 | 12.3 | 427,870 | 85,090 | 42,900 | 10 |

Source : from Natural Disaster Prevention Project, Ministry of Labour & Social Welfare

Record of Flood damaged in 2000

| No | Province | Population | | | | Agriculture | | | |
|----|------------------------|------------|----------|------|---------------|-------------------|-------------------|------------------|----|
| | | Total | Affected | % | People killed | Planted area (ha) | Flooded area (ha) | Damage area (ha) | % |
| 1 | Phongsaly | 170,100 | 670 | 0.4 | | 5,400 | 30 | 20 | 0 |
| 2 | Vientiane | 318,900 | | 0.0 | | 38,010 | 960 | 350 | 1 |
| 3 | Vientiane Municipality | 583,300 | 10,350 | 1.8 | | 51,930 | 3,650 | 1,290 | 2 |
| 4 | Bolikhamxay | 182,000 | 19,400 | 10.7 | | 25,280 | 3,710 | 250 | 1 |
| 5 | Khammouane | 303,200 | 125,360 | 41.3 | 4 | 48,230 | 23,640 | 14,000 | 29 |
| 6 | Savannakhet | 747,600 | 96,460 | 12.9 | | 114,650 | 23,700 | 12,460 | 11 |
| 7 | Salavanh | 285,100 | 16,500 | 5.8 | | 47,680 | 4,740 | 1,400 | 3 |
| 8 | Champasack | 558,000 | 117,940 | 21.1 | 7 | 83,190 | 22,730 | 12,060 | 14 |
| 9 | Attapue | 97,100 | 12,080 | 12.4 | 4 | 13,500 | 1,930 | 1,070 | 8 |
| | Total: | 3,245,300 | 398,760 | 12.3 | 15 | 427,870 | 85,090 | 42,900 | 10 |

Report on Flood Damage in 2001

| Item | Province | Affected | | | | | Agriculture | | |
|------|------------------------|----------|---------|---------|------------|---------------|--------------------|-------------------|------------------|
| | | District | Village | Family | Population | People killed | Planting area (ha) | Flooded area (ha) | Damage area (ha) |
| I | Northern | 8 | | | | | 31,800 | 390 | 240 |
| 1 | Luangprabang | No data | No data | No data | No data | | 10,000 | 10 | 10 |
| 2 | Xaiyaboly | 8 | No data | No data | No data | | 21,800 | 380 | 230 |
| II | Centre | 34 | 1,021 | 24,612 | 138,572 | | 294,000 | 59,290 | 30,193 |
| 3 | Vientiane Municipality | 8 | No data | 425 | No data | | 52,000 | 8,540 | 5,080 |
| 4 | Xiengkhouang | No data | No data | No data | No data | | 14,000 | 100 | 50 |
| 5 | Vientiane | 4 | 63 | No data | No data | | 40,000 | 2,210 | 1,100 |
| 6 | Bolikhamxai | 6 | 147 | No data | No data | | 25,000 | 9,390 | 8,370 |
| 7 | Khammouane | 9 | 495 | 18,833 | 103,042 | | 48,000 | 21,820 | 14,440 |
| 8 | Savannakhet | 7 | 316 | 5,354 | 35,548 | | 115,000 | 17,230 | 1,153 |
| III | Southern | 8 | 442 | 18,000 | 105,478 | | 85,230 | 12,700 | 11,790 |
| 9 | Champasack | 8 | 442 | 18,000 | 105,478 | | 85,230 | 12,700 | 11,790 |
| | Total: | 50 | 1,463 | 42,612 | 244,050 | | 411,030 | 72,380 | 42,223 |

Conclusion of Flood Damaged 2002

| Item | Province | Affected | | | | Agriculture | | | |
|------|------------------------|----------|---------|--------|------------|---------------|--------------------|-------------------|------------------|
| | | District | Village | Family | Population | People killed | Planting area (ha) | Flooded area (ha) | Damage area (ha) |
| I | Northern | 18 | 200 | 4,297 | 24,371 | 1 | 48,100 | 2,551 | 1,670 |
| 1 | Luangprabang | 5 | 39 | 350 | 2,046 | | 10,300 | 189 | 64 |
| 2 | Phongsaly | 4 | 68 | 2,280 | 12,405 | | 6,000 | 1,599 | 962 |
| 3 | Luangnamtha | 1 | 16 | 447 | 2,974 | | 10,500 | 275 | 157 |
| 4 | Bokeo | 6 | 40 | 273 | 1,409 | | 10,500 | 378 | 377 |
| 5 | Oudomxay | 2 | 37 | 947 | 5,537 | 1 | 10,800 | 110 | 110 |
| II | Centre | 34 | 522 | 30,684 | 140,374 | 2 | 288,000 | 40,119 | 24,151 |
| 6 | Vientiane Municipality | 9 | 95 | 4,132 | 21,065 | | 52,000 | 8,018 | 5,493 |
| 7 | Xlengkhouang | 3 | 27 | 176 | 556 | | 15,000 | 57 | 57 |
| 8 | Vientiane | 5 | 7 | 183 | 803 | | 42,500 | 1,825 | 761 |
| 9 | Bolikhamsai | 5 | 93 | 5,666 | 28,028 | 2 | 21,000 | 7,133 | 5,644 |
| 10 | Khammouane | 4 | 180 | 8,550 | 43,589 | | 46,500 | 11,300 | 7,040 |
| 11 | Savannakhet | 8 | 120 | 11,977 | 46,333 | | 111,000 | 11,786 | 5,156 |
| III | Southern | 10 | 420 | 15,361 | 85,037 | | 96,800 | 15,128 | 7,881 |
| 12 | Attapue | 2 | 28 | 1,682 | 6,028 | | 12,500 | 1,505 | 449 |
| 13 | Champasack | 8 | 392 | 13,679 | 79,009 | | 84,300 | 13,623 | 7,432 |
| | Total: | 62 | 1,142 | 50,342 | 249,782 | 3 | 432,900 | 57,598 | 33,702 |

資料6 DMH 資料

I. INTRODUCTION

1. General information

Lao PDR is a landlocked country at the center of Southeast Asia, bordered by Thailand, Myanmar, Cambodia, Vietnam and China. It has a total land area of 236,800 square Km, the population of Lao PDR is 5,377,000 people with the majority residing in rural areas with 47 ethnic groups.

The Mekong River stretches 1,865 Km from the northern border with Myanmar and along most of the western border with Thailand. 80% of the land area is in the Mekong river basin, which drains south to the south China sea, and the other 12% are in the northeast and drains to Vietnam to the Gulf of Tonkin.

Lao PDR has an abundance of forest and water resources with potential for development. Natural resources include timber, hydropower, gypsum, gold and gemstones. Forest (47%) and woodland cover much of are. The country remains an agriculture-based economy with a high percentage of subsistence farmers. Water is the most important natural resources with development potential for hydropower electric.

The climate is tropical with wet and dry seasons. The country is dominated by two monsoons: the Northeast monsoon (from November to mid-March) and Southwest monsoon (from Mid-May to Mid-October), the latter being characterized by frequent and heavy rainfall and high humidity. A short drought about two weeks is normally experienced between the end of June and the beginning of July. Cyclonic disturbances or the passage of ITCZ often causes heavy rainfall otherwise for the most part rainfall is convective and orographic. The country, however, is not vulnerable to the direct impact of tropical cyclones or typhoons, the main agents of catastrophic disasters in the region. Flooding, however, occurs following the passage of cyclonic disturbances in close succession or a dissipating typhoon.

2. History

The first rainfall station was installed in the year 1900 by the French Army in Laos. During the French colonial period, before 1954, the Lao Meteorological stations (Luangprabang, Vientiane, Savannakhet) were under the management of French Indochina meteorological service based in Hanoi (Vietnam). During 1955-1976 the Department of Meteorological and Hydrology (DMH) was under the Ministry of Construction and Transport. After 1976 the DMH was transferred to the Ministry of Agriculture and Forestry. Lao PDR became the WMO member in 1955, the Typhoon Committee in 1978. ASEAN Sub-Committee on Meteorology and Geo-physic in 1997, Lao National Mekong Commission member in 1999.

3. Role and Functions

The DMH is Governmental Organization and also National Agency. The main role is to provide the weather, climate, hydrological data and other related services to meet

national responsibilities, to contribute to the well being, protection of property, the safety and sustainable socio-economic development as well as the international and regional commitments and obligations under various conventions, in particularly the WMO programmes.

DMH is composed of the following Divisions:

- Administration Division
- Technical Division
- Weather forecasting and Aero-meteorological Division
- Meteorological Network and Agro-meteorological Division
- Climatological Division
- Hydrological Division
- Meteorological and Hydrological Services of 18 provinces.

The Headquarter is located in Vientiane Capital, close to Wattay International Airport. The total number of staff is 210 (78 at the Headquarter and 132 in the provinces) including 1 PHD, 38 engineers, 46 technicians and 125 technical observers.

The DMH undertakes observations and analysis of meteorological and hydrological phenomena. It provides weather forecast, warning and climate statistics. Furthermore, it exchanges meteorological and hydrological data with domestic and regional meteorological services as well as promotes multilateral and bilateral technical cooperation.

II. TECHNICAL CONDITIONS

1. Observations

The observations network consists of:

- 17 synoptic stations
- 18 climate stations
- 110 rainfall posts

The synoptic stations are mainly located at the airports. Due to the limited facilities, staff and budgets, the surface observations are mostly done only 4 observations during the daytime, except one synoptic station at the DMH that makes 24 hours observations. The density of the Network is still insufficient. Most of the stations are not appropriately equipped, so lack of basic instruments and facilities. Most of the instruments are old and uncalibrated. The Meteorological satellite station for receiving pictures was unoperated since the end of 2001. There is no upper-air station neither weather radar station.

2. Telecommunication

The collection of observational data within the country and the exchange data and processed information between countries are made through the National Meteorological Telecommunication Network and the Regional Meteorological Telecommunication Network.

At the National level, data collections is mostly made by the High Frequency radio and public telephone. The unreliability is also due to the old and poorly maintained radio transceivers, including batteries and electric generators.

At the International level, the DMH is connected to Hanoi (Vietnam) by 9,600 BPS Satellite link (receiving only). A SADIS system facilitates the reception ICAO Area Forecast products. The connection between Vientiane and the Regional Center Bangkok by GTS with speed of 64 KBPS is implementing under VCP (VISAT Project) in 2001-2002.

3. Weather forecasting

Weather information and forecasts for the public and users are prepared and issued once a day. These products are transferred to the radio and television stations, as well as to the daily newspapers and the concerned agencies. The medium range forecasts are also done weekly. Due to the unoperation of the satellite receiving pictures station DMH also receives the products from advanced centers of neighboring countries and Typhoon Committee member countries, via Internet, especially during the rainy season. The DMH is still disadvantage by the absence of Weather Radar, upper-air station, satellite image receiving station and all the facilities needed for an efficiency work.

4. Climatological data processing

The Meteorological and Hydrological data collected by domestic stations are processed and stored in the data base, and graphic references such as weather charts and paper records of observations are preserved in the data room. The preliminary data checking and quality control are done manually. Since 1997, WMO has supplied CLICOM system and this year 2002 France has continued to upgrade the system into version 3.0. In addition, the Mekong River Commission has also provided the HYMOS system. All data have been compiled in the statistic and printed in various kinds of annual and monthly reports that disseminated to different users.

5. Hydrology

In 1985 hydrological activities were transferred from the Ministry of Telecommunication and Transport. The Hydrological Network experiences the same constraints that affected the Meteorology observation programmes. Unreliable equipment, understaffing and limited of national budget are the main area of deficiency that has to be overcome. During rainy season the forecast of the Mekong River level is done in cooperation with the Mekong River Commission.

6. Meteorological applications

- **Agro-meteorology:** the meteorological stations located in the agricultural experiences stations and agriculture research centre provides only basic data on the local weather, but the agro-meteorological forecast is not done, due to the limited number and unqualified staff, and the lack of appropriate facilities.
- **Aviation:** the main challenge is to be able to provide to the aviation timely and accurate forecasts and warning of severe weather. The synoptic stations are mainly

located at the airports such as Vientiane and Luangprabang International airports. The observation data and airport weather forecasts (TAF, METAR, and SIGMET) are provided to the traffic controllers and airline companies.

- **Public Weather Services:** The meteorological information produced by DMH is usually delivered to the public by the mass media (radio, TV, newspapers) once a day. The TV presentation is limited. Every year, DMH receives visitors who come for study visit such as students from the Lao National University, Vocational schools, farmers etc. So, the role of the DMH becomes more and more important, in particular during the rainy season.

7. Education and training

Our engineers and technicians obtained their Education and specialization abroad such as ex USSR, France, Vietnam, Hungary, India, China and Thailand. The DMH has one training Center that provides long term training (18 months) to about 30 observers (class IV) per promotion. The courses for technician training at the medium level is undertaken for two years, supported by JICA. However, the number of meteorologists and hydrologists as well as their qualification over the county remains insufficient. The DMH has made strenuous efforts to improve the Human Resource Development, in order to meet the increasing technical demands and the advance technology.

8. International Technical Cooperation

Lao PDR has received the assistance through WMO (VCP) such as VISAT Project from Japan, basic equipment from China and France. Concerning bilateral cooperation, we have received the assistance from Vietnam on Meteorological sector development and from Japan on Hydrological sector development.

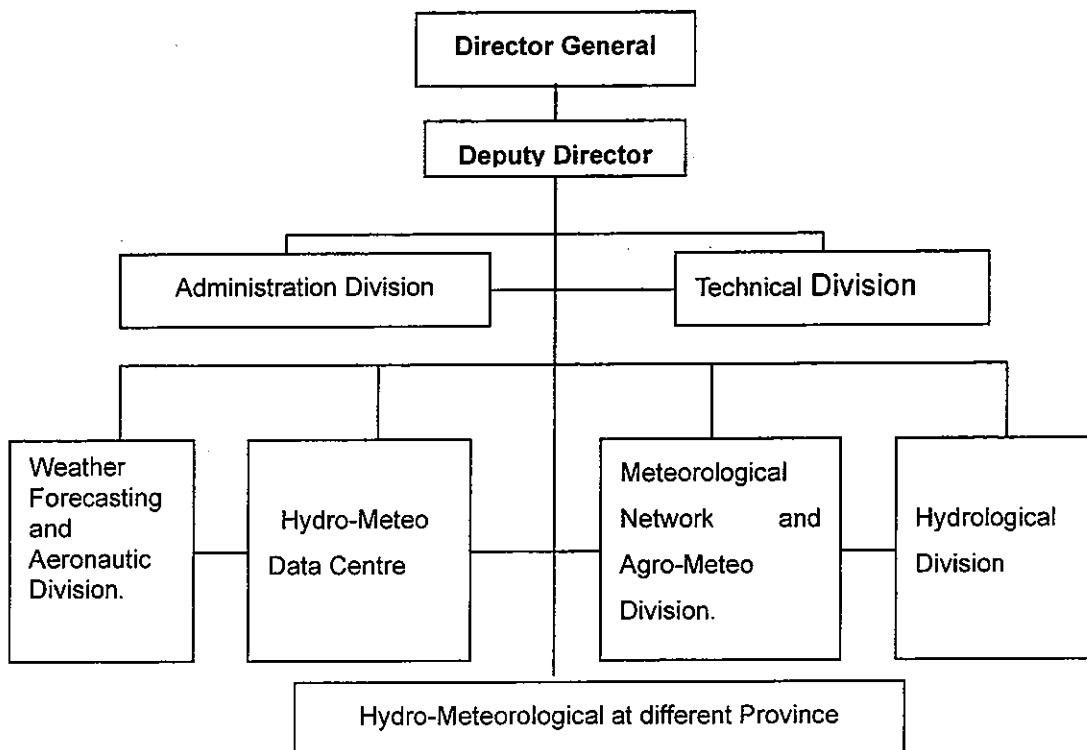
Summary of DMH's Facility and Activity.

1. Organization of DMH.

Department of meteorology and hydrology (DMH) is one of the technical department under ministry of agriculture and forestry since 1976. Under supervision of the DMH as following:

- Director general
- One deputy director general.
- Administration Division
- Technical Division
- Weather forecasting and Aeronautic Division
- Hydro-meteorological data center.
- Meteorological network and agro-meteorological Division
- Hydrological Division.
- Hydro-meteorological service of different province.

Organization Chart of DMH



2. Hydro-Meteo observation network.

In Lao P.D.R there are two primary sources of data, those from meteorological and hydrological stations. There are 85 hydrological stations and 38 meteorological station. All the hydrological stations collected daily water level and precipitation 2 times/day (7h00' and 19h00'). From 85 station has 21 sation have measured the flow. The most

stations located in central and southern Laos and Luangprabang province. There is 38 meteorological station in Lao P.D.R. There is at least one basic meteorological station in each province. We have two different station characteristics: Synoptic and climate station. The main stations are located at the airports. The present station density is insufficient to provide a meaning full interpretation of the local weather system as well as to under take hydrolo-meteo forecasting. Most of station are not fully equipped with basic instrument and poorly named by staff who lacks proper training. Aging and uncalibrated instruments that need repair or replacement further contribute to the deteriorating state and unreliability of the basic network of observation stations in DMH. The limited national resources available to the DMH are the main cause of the present state of the surface observation program.

3. Data processing and analysis:

- In the head quarter of D.M.H there is data storage and data processing center. The main activity is to process all climatological data in accordance to Clicom program (Climate Computing) and Hymos modelling for stream flow

Weather and areonautical meteorology division has prepared short and medium range forecast (daily, weekly, monthly and 3 monthly forecast)

Water and flood forecasting:

Flood forecast from the Mekong River at Vientiane was use from several Methods:

Empirical or stage correlation methods and statistical Methods between the water level at Luangprabang and Vientiane with 426-Km length and lag time 48 Hours (2 days).

During the wet season co-opearate with MRC and every day receive the result of flood forecasting from MRC.

Flood forecasting for Vientiane plain down stream of Nam Ngum Dam use also statistical equation.

4. Term of reference: We agree with the term of reference, which the mission expected. But DMH requests from Tc and need for the future:

1. Pilot project s on preparation water-related hazard maps.
2. Models performance as well as data collection and transmission equipment, including Hardware and software.
3. Pilot data sharing among Tc member to enhance flood forecasting accuracy.
4. Pilot projects on flash flood forecast and warning system, including debris flow and landslides.

On-job-training of Tc hydrologists, including flood forecasting and QPF.

INFORMATION ON THE REGION-FOCUSED TRAINING COURSE

FLOOD HAZARD MAPPING

JFY 2004

東・東南アジア地域別：洪水ハザードマップ作成

COURSE NO.: J-04-04064

January 25, 2005 ~ February 19, 2005



THE GOVERNMENT OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY



Preface

The Government of Japan extends official development assistance (ODA) to developing countries to support self-help efforts that will lead to economic progress and a better life for the citizens of those countries.

Since its foundation in 1974, the Japan International Cooperation Agency (JICA) has implemented Japan's technical cooperation under the ODA program.

Currently, JICA conducts such activities as training, dispatch of experts, provision of equipment, project-type technical cooperation, development studies, dispatch of cooperation volunteers (JOCV), and survey and administration of capital grant aid programs.

The training program for overseas participants is one of JICA's fundamental technical cooperation activities for developing countries. Participants come from overseas in order to obtain knowledge and technology in a wide variety of fields.

The objectives of the JICA training program are:

- (1) to contribute to the development of human resources which will promote the advancement of developing countries, and
- (2) to contribute to the promotion of mutual understanding and friendship.

This training course "Flood Hazard Mapping" starts for the first time in fiscal 2004, as a regional-focused training course for the East and Southeast Asian countries, and will be accepting 16 trainees (2 from each country) at maximum each year until fiscal 2008. It is aimed at contributing to mitigate flood disasters in the Asia monsoon region by providing the practical techniques on producing flood hazard map and enhancing the understanding on how effective this map is in mitigating flood damages to the technical managers and engineers who are engaged in flood or river management in the public sectors.

I. ESSENTIAL FACTS

| | |
|--------------------------|--|
| COURSE TITLE | Flood Hazard Mapping (J-04-04064) |
| DURATION | January 25, 2005 – February 19, 2005 |
| DEADLINE FOR APPLICATION | November 22, 2004 * for acceptance at the JICA Office or the Embassy of Japan |
| NUMBER OF PARTICIPANTS | 16 (2 from each country) at maximum |
| LANGUAGE | English |
| TARGET GROUP | Technical managers or engineers who are engaged in flood or river management at national or local level in the public sectors such as governmental / provincial ministries or municipalities. |
| COURSE OBJECTIVES | Trainees are expected to acquire: (a) Professional knowledge on hydrology, hydraulic and river engineering necessary to produce flood hazard map, (b) Understanding on the effectiveness of flood hazard map and on the way to disseminate and utilize it for the people, (c) Methods to enhance people's capability and promote public awareness to mitigate flood damage, (d) Understanding on the way of producing and applying the flood hazard map for his/her own country/region |
| TRAINING INSTITUTION | (1) Public Works Research Institute (PWRI) Address: 1-6, Minamihara, Tsukuba, Ibaraki, 305-8516, Japan Tel: +81-29-879-6809, Fax: +81-29-879-6709, URL: http://www.pwri.go.jp (2) National Institute for Land and Infrastructure Management (NILIM), MLIT Address: 1 Asahi, Tsukuba, Ibaraki, 305-0804, Japan Tel: +81-29-864-2211, Fax: +81-29-864-4322, URL: http://www.nilim.go.jp |
| ACCOMMODATIONS | Tsukuba International Center (JICA TSUKUBA) Address: 3-6, Koyadai, Tsukuba-shi, Ibaraki-ken, 305-0074, Japan Tel: 81(*)-29(**)-838-1111, Fax: 81(*)-29(**)-838-1119, URL: http://www.jica.go.jp/ *Incase no rooms are available at the JICA TSUKUBA or in case participants must stay in other cities, JICA will arrange accommodations for participants are other appropriate places. |
| ALLOWANCES & EXPENSES | The Government of Japan provides the following allowances and covers the following expenses through JICA in accordance with relevant laws and regulations. <u>Details:</u> Round-trip air ticket between an international airport designated by JICA and Japan, accommodation allowance, living allowance, outfit allowance, book allowance, shipping allowance, expenses for JICA study tours, free medical care for participants who become ill after arrival in Japan (costs related to pre-existing illness, pregnancy and dental treatment are not included), etc. |

* : country code of Japan, ** : area code for Tsukuba

<Training Institution: Public Works Research Institute (PWRI) >

The Public Works Research Institute (PWRI) has been carrying out multidisciplinary research and development for enhancing civil engineering technologies and providing quality infrastructure for more than 80 years, such as hydrologic and hydraulic engineering, erosion and sediment control engineering, water environment, earthquake disaster prevention and others. Many large-scale testing facilities, a wealth of research literatures and abundant experiences support our activities effectively. PWRI has close connection with national organizations, which construct and manage infrastructures, often cooperating with academic organizations and private companies. The fruit of efforts have significantly been utilized through improving practical standard specifications and manuals, and providing technical guidance and training for infrastructure managers in Japan as well as developing countries.

In addition, under the circumstance that the importance of taking appropriate actions to mitigate water related disasters such as floods and droughts which has been emphasized at numerous international events and conferences, PWRI is currently preparing to establish an international centre on water related hazard and its risk management under the auspices of UNESCO in coordination with the agencies and research institutes concerned. The Centre is planned to conduct research, training and information networking activities focusing on water related hazard and its risk management.

II. CURRICULUM

- 1. Presentation on the “Report on flood situation”: introducing the flood occurrences and its management policies in his/her own country/ region**
- 2. Meaning of flood hazard map**
- 3. Scope and contents of flood hazard map**
- 4. Procedure of producing flood hazard map**
 - (1) Gathering the basic information
 - (2) Setting up the basic condition
 - (3) Drawing the basic geographic map
 - (4) Gathering and examining the historical inundation information
 - (5) Conceiving the evacuation plan
 - (6) Drawing the preliminary flood hazard map
 - (7) Producing the flood hazard map
- 5. Dissemination and utilization of flood hazard map**
- 6. Effectiveness of flood hazard map**

7. **Fundamental analyzing method necessary to produce flood hazard map**
 - (1) Hydrologic and hydraulic analysis
 - (2) Runoff simulation
 - (3) Inundation simulation
8. **Progress and challenges in producing flood hazard maps in other countries/ regions**
9. **Field study, its presentation and discussion**
10. **Site visit for typical municipality and river management office**
11. **Producing the concluding report, and its presentation and discussion**

At the end of the course, all trainees are required to produce and present 2-3 pages concluding report for discussion on how to produce and utilize the flood hazard map in his/ her own country. This report should include the problems involved in its implementation and the possible solutions.

III. REQUIREMENT FOR APPLICATION

Applicants should be:

- (1) nominated by their government in accordance with the procedures mentioned in IV,
- (2) technical managers or engineers currently engaged and experienced for more than 5 years in river or flood management issues in the public sector,
- (3) university graduates or equivalent,
- (4) competent in English,
- (5) under 50 years of age,
- (6) in good health (both physically and mentally fit for the training), and
- (7) non-military personnel.

ATTENTION

Participants are required:

- (1) not to change course subjects or extend the course period,
- (2) not to bring any members of their family;
- (3) to return to their home country at the end of their seminar according to the international travel schedule designated by JICA,
- (4) to refrain from engaging in political activities or any form of employment for profit or gain; and
- (5) to observe the rules and regulations of their place of accommodation and not to change accommodations designated by JICA.

IV. PROCEDURE FOR APPLICATION

1. The governments desiring to nominate applicants for the course should fill in and forward one (1) original and three (3) copies of the Nomination Form (Form A2A3) and the “Report on Flood Situation” for each applicant as described below to the JICA Office (or the Embassy of Japan) **by November 22, 2004.**
2. The JICA Office (or the Embassy of Japan) will inform the applying government whether or not the nominee's application has been accepted **not later than December 20, 2004.**
3. **“Report on Flood Situation” to be submitted together with the Nomination Form and sent by E-mail**

All applicants for this training course are required to prepare and submit 5-10 pages-typewritten “Report on Flood Situation” to introduce flood occurrences and its management policies in his /her own region or country as described in the ANNEX I. It is requested to send this Report by E-mail (whrm@pwri.go.jp) in the digital/ electronic form.

4. **Preparation of presentation on “Flood Situation”**

At the beginning of the course, all accepted applicants are required to make 10-minutes presentation on the above report by using the presentation material such as Power-point slides or OHP, which includes some photos and figures. Therefore, the accepted applicants are as well requested **to prepare and bring this presentation material with them. In case making the Power-point presentation, it is requested to include and bring it in the digital/ electronic device such as Floppy disk or CD-ROM.**

V. OTHER MATTERS

1. Pre-departure orientation will be held at JICA overseas offices (or Japanese diplomatic missions) to provide the selected candidates with details on travel to Japan, conditions of training, and other matters. Participants will see a video, “TRAINING IN JAPAN”, and will receive a textbook and cassette tape, “SIMPLE CONVERSATION IN JAPANESE”. A brochure, “GUIDE TO TRAINING IN JAPAN” will be handed to each selected candidate before (or during) the orientation.
2. Participants who have successfully completed the training course will be awarded a certificate by JICA.

ANNEX I

Format of “Report on Flood Situation”

< Cover Page >

REPORT ON FLOOD SITUATION
in < YOUR REGION >, < YOUR COUNTRY >

JICA region focused training course on flood hazard mapping

JFY 2004

Prepared by < YOUR NAME >
< YOUR POSITION >, < YOUR ORGANIZATION >
< YOURCOUNTRY >

<Main Pages>

I. ORGANIZATION (Maximum 3 pages)

1) Name of your organization

Please describe the name of your organization, contact address, telephone & fax number, and website address.

2) Outline of your organization

Please describe the role, objective, mission and main activities of your organization.

3) Organization chart

Please include your organization's chart and describe the mission of each section as well as its number of staffs.

4) Your recent work

Please describe your position and role in your organization, and your main works that you have done for the past 5 years.

II. Overview of national policies on flood management (Maximum 2 pages)

Please introduce the flood management policy and flood control works (structural and non-structural) in your country as well as institutional and legislative framework.

III. Specific conditions of the target area for which report will be prepared (Maximum 4 pages)

- 1) Selection of the target area (local, municipality, province/ prefecture or country level) to be covered in this report, and a brief introduction on its geographic and hydro-meteorological perspectives.
- 2) Introduction of the policies and institutional framework in this area on flood management, damage mitigation, and emergency response measures such as early warning systems
- 3) Hydro-meteorological characteristics of the flood occurrences, and their social and economical damages recorded at least in last 5 years for this area
- 4) Way of evacuation characterized in this area during flood events
- 5) Challenge and problems to be solved in order to mitigate flood damage and to facilitate people's smooth evacuation in light of past experiences in this area

IV. Expectation to this training course (Maximum 1 page)

<Notes>

- Use single spacing on A4 size paper (210mm X 297mm) with MS-Word
- Strongly requested to send the Report by E-mail (whrm@pwri.go.jp) in the digital/ electronic form
- Type about 500 words for each page
- The number of pages shall be 5-10 pages.
- Effective use of photos, figures and graphs is recommendable.



CORRESPONDENCE

For enquiry and further information, please contact a JICA office or Embassy of Japan, or address correspondence to:

**Program Team I,
Tsukuba International Center (JICA TSUKUBA),
Japan International Cooperation Agency (JICA)**

Address: 3-6, Koyadai, Tsukuba-shi, Ibaraki-ken 305-0074, JAPAN

Tel.: (+81-29)-838-1117 Fax.: (+81-29)-838-1790

URL: <http://www.jica.go.jp/> E-mail: tbictp1@jica.go.jp

資料8 調査団収集資料リスト

| No. | 資料名 | 入手場所 |
|-----|---|---------|
| 1 | Post-Flood Investigation Report (Area: the Pampanga River Basin System, Event: Southwest Monsoon August 2004) | PAGASA |
| 2 | Shapers of New Asia | TCS |
| 3 | Water & Flood, A Look at Philippine Rivers and Flood Mitigation Efforts | FCSEC |
| 4 | ピナツボ火山噴火とその後の対応経緯 (Oct. 2004, 和文) | FCSEC |
| 5 | Pampanga Delta Development Project, Flood Control Component Phase-1 (リーフレットコピー) | FCSEC |
| 6 | Community-Based Disaster Risk Management, integration to socio-economic development process & field practitioners' handbook | UNESCAP |
| 7 | Mekong River Commission パンフレット等一式 (内容) <ul style="list-style-type: none"> ・ Mekong, the mother (CD-ROM) ・ People and the Environment Atlas of the Lower Mekong Basin (CD-ROM) ・ Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin 5 April 1995 (リーフレット) ・ Junior Riparian Professional Programme for Sustainable Human Resource Development (リーフレット) ・ Sharing the Water, Peacebuilding on the Mekong (リーフレット) ・ Cradle of Life, People and development in the Mekong Basin (リーフレット) ・ Annual Report 2003 (パンフレット) ・ Catch and Culture, Fisheries Research and Development in the Mekong Region (パンフレット) ・ The People's Highway: Past, Present and Future Transport on the Mekong River System (パンフレット) ・ The Story of Mekong Cooperation (パンフレット) | MRC |
| 8 | Improvement of MRC's Regional Flood Maps Project (Basinwide) Final Report, May 2003 | MRC |

| | | |
|----|--|-------------------------|
| 9 | Mekong Bulletin, Forecast period: 22-26 September 2004 | MRC |
| 10 | Water level at 7am of Mekong at Vientiane | MRC |
| 11 | Geographical Study of Flooding Immediately Down-Stream from Pamong In the Mekong River Basin | MCTPC |
| 12 | Flood Extent (6 種類) <ul style="list-style-type: none"> • Flood 1996 Extent in Champsak Plain • Flood 1996 Extent in Kammuane Plain • Flood 1995 Extent in Bolikhamxay Plain • Flood 1995 Extent in Vientiane Plain • Flood 1995 Extent in Savannakhet Plain • Flood 1995 Extent in Bolikhamxay Plain | MCTPC |
| 13 | Flood Control and Waterlogging Drainage Planning of Paddy Fields for Vientiane Plain in Lao PDR | MAF, Dep. of Irrigation |
| 14 | Organizational structure for disseminating of weather and flood forecasts and warning in Lao PDR. | DMH |
| 15 | 30 th Anniversary Nam Ngum Hydro Power Plant - I | Nam Ngum Dam |
| 16 | Report of the people rice field, plantation, fish ponds affected by flood (10-20 September 2004 in Thasavang Village) | Thasavang Village |

