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## Chart-1 Work Schedule

### **Phase I : Basic Study and Formulation of a Master Plan**

#### 1st Field Work in the Philippines (1<sup>st</sup> October 1998 to Mid-March 1999)

- (1) Data Collection and Review of Existing Studies/Programs
- (2) Information Collection by Means of Aerial Photographs or Satellite Images
- (3) Field reconnaissance Survey
- (4) Disaster Mitigation Facility Survey
- (5) Hydrological Survey
- (6) Survey on Calamities and Casualties by Floods and Debris Flows
- (7) Sediment Yield Survey
- (8) Survey on Disaster Awareness and Preparedness including Evacuation
- (9) Socio-Economic Framework
- (10) Preparation of Pilot Project
- (11) Preparation of Progress Report (1)

#### 2nd Field Work / 1st Home Work (17 May to 31 July 1999)

- (1) Determination of Project/Program Dimensions
- (2) Damage Analysis
- (3) Formulation of Master Plan
- (4) Initial Environmental Assessment
- (5) Cost Estimate
- (6) Project Evaluation
- (7) Selection of Priority Projects
- (8) Formulation of the Pilot Project
- (9) Preparation of Interim Report
- (10) Preparation of Technical Transfer Seminar

### **Phase II : Feasibility Study on the Priority Projects & Programs Selected in the Master Plan**

#### 3rd Field Work in the Philippines (Mid-August to Mid-December 1999)

- (1) *Discussion of Interim Report (Master Plan)*
- (2) *First Technical Transfer Seminar*
- (3) *Supplemental Data Collection and Survey*
- (4) *Implementation of Pilot Project*
- (5) *Formulation of Planning Framework*
- (6) *Social Environment Impact Study*
- (7) *Preparation of Progress Report (2)*

#### 2nd Home Work in Japan (Mid-January to Mid-March 2000)

- (1) Facility Design and Construction Plan
- (2) Implementation and Operation & Maintenance Plan
- (3) Cost Estimate
- (4) Project Evaluation
- (5) Preparation of Draft Final Report
- (6) Preparation of Second Technical Transfer Seminar

#### 4th Field Work in the Philippines (May to June 2000)

- (1) Discussion on Draft Final Report
- (2) Second Technical Transfer Seminar
- (3) Review of Technical Transfer

#### 3rd Home Work in Japan (15 days in July 2000)

- (1) Preparation of Final Report



**Chart-3 List of Study Team Experts and Their Counterpart Personnel**

No.	JICA Study Team	Counterpart Personnel (GOP)	Major Priority Items for Technology Transfer
1.	Mr. Hideki SATO Team Leader	- Mr. Bernardo P. AMAN Assistant Project Director, PMO-MFCP DPWH, Manila - Mr. Orlando B. ROCES Assistant Director, DPWH Region-V	<ul style="list-style-type: none"> <li>• Overall supervision of the Study</li> <li>• General monitoring of the technology transfer plan</li> </ul>
2.	Mr. Fumihiko FURUICHI Deputy Leader/ Non-structural Measures	- Mr. Eduardo B. TALASTAS Chief, Planning and Design Division, DPWH Region-V	<ul style="list-style-type: none"> <li>• General arrangement and supervision of soft management sector in the Study</li> </ul>
3.	Masayuki SHIRAISHI Hydrology/ Hydraulics/ River Planning	- Mr. Teodoro M. CERALDE Engineer II, Bureau of Design, DPWH (Manila) - Mr. Benjamin BUITRE Engineer III, DPWH Region-V	<ul style="list-style-type: none"> <li>• Meteo-hydrological survey</li> <li>• Climatic and rainfall data analysis</li> <li>• Discharge data and rating curves</li> <li>• Sediment data analysis</li> </ul>
4.	Mr. Hiroshi FUKASAWA & Sabo Planning	- Mr. Orlando CASIO Engineer III, Planning Service, DPWH (Manila) - Mr. Dexter I. ATUTUBO Engineer III, DPWH Region-V	<ul style="list-style-type: none"> <li>• Investigations on topography and geology (for disaster&amp;hazard mapping)</li> <li>• Sabo planning</li> <li>• Delineation of hazard areas</li> </ul>
5.	Mr. Toshinori KONDO & Mr. Nobuhiko INO Facility Design	- Mr. Nelson LIVARRA Engineer III, Bureau of Design, DPWH (Manila) - Mr. Vicente A. MIRABALLES Engineer III, Planning and Design Division, DPWH Region-V	<ul style="list-style-type: none"> <li>• Inventory of existing structures and facilities</li> <li>• Determination of facility planning criteria</li> <li>• Basic design of the proposed facilities</li> </ul>
6.	Mr. Koji KOGA Construction Planning/ Cost Estimate	- Mr. Ignacio ODIAMAN Engineer III, DPWH Region-V - Mr. Tirso PERLADA, Jr. Engineer III, Bureau of Construction	<ul style="list-style-type: none"> <li>• Construction planning</li> <li>• Cost estimate (preliminary)</li> <li>• Procurement plan</li> </ul>
7.	Ms. Kumi SAITO Land Use Planning	- Ms. Eleanor BERTILLO Engineer II, DPWH Region-V	<ul style="list-style-type: none"> <li>• Review of the existing land use</li> <li>• Land use planning &amp; land tenure</li> <li>• Determination of resettlement area</li> </ul>
8.	Mr. Itaru NAGAMINE Surveying/ Aerial Photo/ Satellite Image Analysis	- Mr. Francisco GUIRINDOLA Engineer III, Bureau of Design, DPWH (Manila)	<ul style="list-style-type: none"> <li>• Supervision of surveys</li> <li>• Analysis of aerial photos and satellite image</li> </ul>
9.	Mr. Takashi HARADA Mapping Supervision	- <i>None for GOP Counterpart (Staffs of CERTEZA)</i>	<ul style="list-style-type: none"> <li>• Aero-triangulation</li> <li>• Topographic mapping</li> </ul>
10.	Mr. Justino R. ARBOLEDA Agricultural Production/ Agro-Industry Development	- Mr. Angeles L. NIEVA, Provincial Agriculturist, Provincial Agriculture Office, Provincial Government of Albay	<ul style="list-style-type: none"> <li>• Supervision of surveys</li> <li>• Analysis of aerial photos and satellite image</li> </ul>
11.	Ms. Anita AMBROSIO Evacuation System	- Mr. Alex MANDAC Civil Defense Officer II, Office of Civil Defense (OCD)	<ul style="list-style-type: none"> <li>• Review of evacuation system</li> <li>• Designing evacuation system</li> <li>• Preparation of educational materials</li> </ul>
12.	Mr. Norio TAKAYANAGI Forecasting & Warning System	- Mr. Orlando AREVALO, Civil Defense Officer I, Office of Civil Defense (OCD)	<ul style="list-style-type: none"> <li>• Desigh of forecasting and warning system</li> <li>• Standardization &amp; Judgement of disaster levels</li> </ul>
13.	Mr. Tetsuya ISHII Institutions/ O&M Planning	- Mr. Jose ABARETA Engineer III, DPWH Region-V	<ul style="list-style-type: none"> <li>• Legal framework</li> <li>• Organization for disaster prevention</li> </ul>
14.	Mr. Katsuhiko MASAKI & Mr. Kiminari TACHIYAMA Socio-economy/ Financing	- Mr. Victor B. UBALDO Engineer V, NEDA Region-V - Mr. Guillermo T. TULOD, Jr. Chief Economic Development Specialist	<ul style="list-style-type: none"> <li>• Socio-economic analysis</li> <li>• GRDP modeling</li> <li>• Integration of disaster prevention into area development</li> </ul>
15.	Mr. Israel G. BENTILLO Environmental Assessment	- Mr. Frederick RICO, Sr. Environmental Management Specialist, DENR Region-V	<ul style="list-style-type: none"> <li>• Initial Environmental Examination (IEE)</li> <li>• Spocial survey and preparation</li> </ul>
16.	Mr. Taro TSUBOGO & Mr. Shinichi FUKASAWA Logistics Support	- Ms. Marlyn BRISTOL Clerk II, DPWH Region-V - Ms. Jennifer BAILON Clerk II, DPWH Region-V - Ms. Ma. Fe VALENZUELA, Engineering Assistant, DPWH Region-V	<ul style="list-style-type: none"> <li>• Purchasing</li> <li>• Bookkeeping and accounting</li> <li>• Filing of documents</li> <li>• Operation of vehicles</li> </ul>
	JICA Study Team	- Mr. Jaime J. CASTAÑEDA Technical Support Staff, PMP-MFCP	<ul style="list-style-type: none"> <li>• Work procedure and arrangement</li> </ul>
		- Mr. Rommel P. RAMIREZ Draftsman, DPWH Region-V	<ul style="list-style-type: none"> <li>• Work procedure and arrangement</li> </ul>

- \* Other DPWH staff assigned to the Study Team are the following:
- Jesus MONREAL, Researcher, DPWH Region V
- Edgar ACEBUCHE, Draftsman, DPWH Region V
- Rommel RAMIREZ, Draftsman, DPWH Region V
- Eduardo DACUNO, Utility Worker, DPWH Region V
- Nilo SANOSA, Utility Worker, DPWH Region V
- Erwin MACATINGRAO, Engineering. Asst., DPWH Region V
- Ma.FE VALENZUELA, Data Controller/Encoder, DPWH, Region V
- Alex Ciano, Driver, DPWH Region V
- Crispulo Leon, Driver, DPWH Region V

**Chart-4 Major Technology Transfer Seminars & Workshops**

		Levels of Nation, Region & Province	Levels of City & Municipality & Barangay
<u>Phase I</u>	<b>1st Field Work</b>	<p>The Explanation and Discussion of the Inception Report</p> <p align="center"><b>1st PCM Workshop</b></p> <ul style="list-style-type: none"> <li>• <b>Purpose</b></li> <li>- Establishment of the common understanding among the counterpart agencies of the Gov. of Philippines, Albay Province and the related cities and municipalities about the problems and objectives related to the regional disaster prevention plan around Mayon Volcano area</li> </ul>	<p><u>Survey on the Calamities and Casualties by Flood and Debris Flow</u></p> <p align="center"><b>PRA Survey</b></p> <ul style="list-style-type: none"> <li>• <b>Purpose</b></li> <li>- To grasp the accurate extent of the calamities and casualties.</li> <li>- To let the people learn the lessons from their own experiences of the previous disasters by using the visual tools and methods</li> </ul>
	<b>1st Home Work</b>	<p align="center">⇓</p> <p>(Formulation of the Master Plan.)</p> <p align="center">⇓</p> <p>(Preparation of the Interim Report.)</p> <p align="center">⇓</p> <p>(Explanation and discussion of the Interim Report)</p> <p align="center">⇓</p>	<p><u>Survey on the Disaster Awareness and Preparedness including Evacuation</u></p> <p align="center"><b>PRA Survey</b></p> <ul style="list-style-type: none"> <li>- To become the people recognize the precise plan of self-defense and knowledge of the disaster prevention.</li> </ul>
<u>Phase II</u>	<b>2nd Field Work</b>	<p align="center"><b>1<sup>st</sup> Technology Transfer Seminar</b></p> <p align="center"><b>2<sup>nd</sup> PCM Workshop</b></p> <ul style="list-style-type: none"> <li>• <b>Purpose</b></li> <li>- To validate the results of the People's Intention Survey among the existing and potential resettlers.</li> <li>- To actively participate them in the management planning process of the proposed resettlement sites and livelihood development projects/ programs.</li> </ul>	<p align="center"><b>Implementation of the pilot project</b></p> <p align="center"><b>3<sup>rd</sup> PCM Workshop</b></p> <ul style="list-style-type: none"> <li>- To educate the people in the disaster prone area about the mechanisms of disaster occurrence and its prevention.</li> <li>- To make the implementation plan (PDM) based on the Pilot Project scheme.</li> </ul>
	<b>2nd Home Work</b>	<p align="center">⇓</p> <p>(F/S of the priority project)</p> <p align="center">⇓</p> <p>(Preparation of the Draft Final Report )</p> <p align="center">⇓</p> <p>(Discussion of the Draft Final Report )</p> <p align="center">⇓</p>	<p align="center"><b>4<sup>th</sup> PCM Workshop</b></p> <ul style="list-style-type: none"> <li>- To assess the results of the Pilot Project based on the PDM.</li> <li>- To educate the people to manage the disaster prevention system created by the Pilot Project with PDM for cooperation with the local government units (LGUs).</li> </ul>
	<b>3rd Field Work</b>	<p align="center"><b>2<sup>nd</sup> Technology Transfer Seminar</b></p> <p align="center"><b>5<sup>th</sup> PCM Workshop</b></p> <ul style="list-style-type: none"> <li>• <b>Purpose</b></li> <li>- To transfer the result of the First Field Work to the representative of the counterpart organizations of the Gov. of Philippines and local government units (LGUs).</li> <li>- Making the PDM as the manual for the implementation and supervising of the M/P.</li> </ul>	
	<b>3rd Home Work</b>	<p align="center">⇓</p> <p>(Making the Final Report.)</p>	
<b>After the Study</b>	<p>The Disaster Management Organizations of the Philippines (including the counterpart agencies and LGUs) would be enabled to manage and monitor the implementation of M/P projects and programs, using the PDM.</p>	<p>The local community personnel could positively manage and implement the "Community Disaster Prevention Plan" using the PDM in cooperation with the local government units.</p>	

**Chart-5 Planned Work Items for Technology Transfer**  
(Plan as of October 1998)

(1) Hydrology/ Hydraulics/ River Planning

Name of the Counterpart and Position & Institution : Mr. Teodoro M. Ceralde,  
Engineer II, Planning Service, DPWH (Manila) and Mr. Benjamin Buitre, Engineer III, DPWH  
Region-V  
JICA Expert in Charge : Mr. Masayuki Shiraishi

- 1) Study on Potential Disasters
  - a. Flood
    - Analysis of meteorological data
    - Calculation of runoff capacity of the rivers
    - Estimate of probable storm rainfall and discharge
  - b. Debris/ mud flow
    - Climatic and rainfall patterns (hourly)
  - c. Slope collapse
    - Climatic and rainfall patterns (hourly)
  - d. Landslide
    - Climatic and rainfall patterns (daily)
  - e. Typhoon
    - Analysis of typhoon data  
(occurrence, wind speed, course, arrival time, etc.)
- 2) Hazard Mapping
  - a. Hazard risk areas
  - b. Protection items from the disaster
  - c. Potential damage
- 3) Structural Measures
  - a. Present conditions of rivers and their structures
  - b. Evaluation of present protective measures and rehabilitation
- 4) Selection of Conceivable Alternatives for Structural Measures
  - a. Criteria for selection of structural measures
  - b. Selection of structural measures and allocation
  - c. Preliminary estimates of B/Q
- 5) Evaluation of Technical Capability for Structural Measures
  - a. Construction method
  - b. O&M method
- 6) Basic Plan for Structural Measures

- a. Rehabilitation plan for structural measures
- b. Staged development for structural measures
- c. Estimate of B/Q for basic plan

(2) Sabo Planning

Name of the Counterpart and Position & Institution : Mr. Orlando Casio, Engineer III, Planning Service, DPWH (Manila) and  
 Mr. Dexter I. Atutubo, Engineer III, DPWH Region-V  
JICA Expert in Charge : Mr.Hiroshi Fukasawa

- 1) General Understanding on Sabo Planning
  - a. Outline of the Study
  - b. Necessity of sabo planning
  - c. Peculiarity of sabo planning work in active volcano's slope
- 2) Process to work out a Hazard Map
  - a. Topographical classification mapping
    - Utilization of aerial photographs and satellite images
    - Geomorphological configuration items
  - b. Disaster mapping
    - Data collection, reference review
    - Field survey
    - Legend categorization
  - c. Hazard mapping
    - Danger area zoning
    - Danger level setting
- 3) Sabo Planning Work for Active Volcano's Slope
  - a. Sediment yield analysis and sediment transport analysis
    - River bed material survey
    - Boring survey
    - River cross section survey
  - b. Structural facility placement plan
    - Number and location on a river system, facility type and size, structural method
  - c. Primary factors to be considered for construction work
    - Economic benefit and cost
    - Frequency and extent of disaster
    - Phasing of the implementation schedule

(3) Facility Design



Name of the Counterpart and Position & Institution : Mr. Nelson Livarra, Engineer III, Bureau of Design, DPWH (Manila) and Mr. Vicente A. Miraballes, Engineer III, DPWH Region-V  
JICA Expert in Charge : Mr. Toshinori Kondo

- 1) General Understanding on Facility Design
    - a. Outline of the Study
    - b. General acknowledge of facility design in Japan
    - c. Facility design in active volcano's slope
  - 2) Structural Facility Survey
    - a. Data collection
    - b. Field survey
    - c. Inventory of record sheets
      - Number and location of river systems, facility type, construction year, facility size, structural method
  - 3) Facility Design for Active Volcano's Slope
    - a. Draft design work in Master Plan
    - b. Detail design work in Feasibility Study
      - Sabo dam, consolidation dam, ground sill, spur dike, guiding dike, sand pocket
    - c. Rehabilitation work
      - Existing dam and dike
- (4) Construction Planning/ Cost Estimate

Name of the Counterpart and Position & Institution : Mr. Ignacio Odiaman, Engineer III, DPWH Region-V and Mr. Tirso PERLADA, Jr., Engineer III, Bureau of Construction  
JICA Expert in Charge : Mr. Koji Koga

- 1) Construction Planning
  - a. Regulations and procedures for bidding and procurement
  - b. Inventory of civil works to be implemented
  - c. Preparation of procurement and construction plans
- 2) Cost Estimate
  - a. Investigations on unit prices of materials and equipment
  - b. Confirmation of the factors to be considered in cost estimate such as taxes, contingencies, administration, engineering fee, etc.
  - c. Cost estimate of the projects and programs proposed in Master Plan and those of the priority projects

*Note : The more detailed work items are to be determined through discussion between JICA Expert and counterpart staff.*

(5) Land Use Planning

Name of the Counterpart and Position & Institution : Ms. Eleanor Bertillo, Engineer II,  
DPWH Region-V  
JICA Expert in Charge : Mr. Kumi Saito

- 1) Review of the Existing Land Use
  - a. Grasp of the current land use situations
  - b. Analysis of aerial photos and satellite images
  - c. Perspective of changes in land use trends or patterns
- 2) Land Use Planning
  - a. Integration of local development plans worked out by the authorities
  - b. Conformity with the area development plans
- 3) Determination of Resettlement Area
  - a. Dissection of disaster and hazard maps
  - b. Identification of the dangerous zones and delineation of hazard areas
  - c. Planning of community land use

(6) Surveying, Aerial Photo/ Satellite Image Analysis

Name of the Counterparts and Position & Institution : Mr. Francisco Guirindola, Engineer III,  
Bureau of Design, DPWH (Manila)  
JICA Expert in Charge : Mr. Itaru Nagamine

- 1) Surveying
  - a. River surveying
    - River surveying plan and method
    - Compilation of survey results
    - Use of final results
- 2) Aerial Photography
  - a. Flight plan of aerial photography
    - Coverage
    - Altitude
    - Scale
    - Number of flights
  - b. Analysis of aerial photos

- Triangulation method
- Interpretation of aerial photos

(7) Evacuation System

Name of the Counterpart and Position & Institution: Mr. Alex Mandac, Civil Defense Officer II,  
Office of the Civil Defense (OCD)  
JICA Expert in Charge : Ms. Anita Ambrosio

1) General Understanding on Evacuation System

- a. Existing evacuation plan
- b. Organizations involved
  - Functions
  - Staffing and organizational structure
  - Budget allocation and expenditures
  - Equipment and facilities
- c. Evacuation procedures
- d. Evacuation centers
  - Criteria for selection
  - Facilities
  - Location
  - Operations and maintenance
- e. Training programs

2) Designing Evacuation System

- a. Organization
- b. Standards
- c. Procedures
- d. Design location

3) Preparation of Educational Materials

(8) Forecasting & Warning System

Name of the Counterpart and Position & Institution: Mr. Orlando Arevalo, Civil Defense Officer I,  
Office of Civil Defense (OCD)  
JICA Expeert in Charge : Mr. Norio Takayanagi

1) General Understanding on Forecasting and Warning

- a. Outline of the Study
- b. Definition of words

- Hazard, evacuation, mitigation, reliability and others
- c. Roles of information system in disaster prevention activity
  - Monitoring, forecasting, warning and communication for emergency response, rehabilitation and reconstruction
- 2) Observation of the Sites and Appropriate Measurement of Phenomena
  - a. Seismograph
    - Determination of criteria and formula
  - b. Rainfall
    - Statistical formula
- 3) New Observation Technology
  - a. Volcanic eruption
  - b. Debris flow, slope failure and landslide
- 4) Standardization and Judgement of Disaster Levels
  - a. Volcanic eruption
  - b. Debris flow
  - c. Flood (or inundation)
- 5) Design of Communication Systems (at the following stages)
  - a. Warning
  - b. Emergency response
  - c. Rehabilitation
  - d. Reconstruction
- (9) Institutions/ O&M Planning

Name of the Counterpart and Position & Institution : Mr. Jose Abareta, Engineer III, DPWH Region-V  
JICA Expert in Charge : Mr. Tetsuya Ishii

- 1) Legal Framework
  - a. Legal instruments (Republic Act, Presidential Decree, etc.)
  - b. Legislation and regulations on disaster management
    - Disaster prevention
    - Emergency operation
    - Disaster restoration
    - Financial measures for disaster
- 2) Regulatory and Operational System
  - a. National Calamities and Disaster Preparedness Plan (OCD)
  - b. Operation Mayon (PHIVOLCS)
- 3) Organization for Disaster Prevention
  - a. Statute and activities of each organization

- Duties and responsibilities
  - b. Number of staff assigned and organizational chart
  - c. Manpower development policy and recruitment
  - d. Budget (appropriated and disbursed)
- 4) Financial Management
- a. Calamity funds and its application system
  - b. Internal revenue allotment
  - c. Congressional initiative allocation
  - d. Development fund at each LGU level
  - e. O&M state of the infrastructure and facilities

(10) Socio-economy/ Financing

Name of the Counterpart and Position & Institution: Mr. Victor B. Ubaldo, Engineer V, NEDA Region-V  
JICA Expert in Charge : Mr. Katsuhiko Masaki

- 1) Development Plans
- a. National, regional, and provincial development plans
    - Overall policy and strategies
    - Investment plans
    - Priority for disaster management
    - Strategies/ plans for Bicol Region and Albay Province
  - b. City/ municipalities and area development plans
    - Development strategies
    - Investment plans
    - Priority for disaster management
    - Strategies/ plans for community development (especially the areas around Mayon Volcano)
- 2) Socio-economic Situation
- a. National and regional socio-economic data
    - Demography
    - Natural resources endowment
    - Economic structure
    - Social status
    - Financial situation
    - Government service delivery
  - b. Provincial and local socio-economic data
    - Demography

- Natural resources endowment (potential and resources assessment)
  - Economic structure
  - Financial situation
  - Social status (BHN and livelihood)
- 3) Project Evaluation and Implementation Planning
- a. Project evaluation (IRR, NPV, B/C, B-C, etc.)
    - Economic analysis
    - Financial analysis
  - b. Evaluation of multiplier effects

(11) Environmental Assessment

Name of the Counterpart and Position & Institution : Mr. Frederick Rico, Senior Environmental Management Specialist, DENR Region-V  
JICA Expert in Charge : Mr. Israel G. Bentillo

- 1) Environmental Management System in the Philippines
  - a. Legal framework
  - b. Institutional structure (related agencies and institutions)
  - c. Procedure of environmental assessment
- 2) Initial Environmental Examination (IEE)
  - a. Evaluation method and procedure
  - b. Physical and social impacts to be considered in evaluating the Master Plan projects/ programs formulated for comprehensive disaster prevention
- 3) Environmental Impact Assessment (EIA)
  - a. Evaluation method and procedure
  - b. Points to be considered in assessing the priority projects/ programs proposed in Master Plan

*Note : The more detailed work items are to be determined through discussion between JICA Expert and counterpart staff.*

(12) Logistic Support

Name of the Counterparts and Position & Institution : Ms. Marlyn Bristol, Clerk II and Ms. Jennifer Bailon, Clerk II, DPWH Region-V  
JICA Expert in Charge : Mr. Taro Tsubogo

- 1) Logistic Management
  - a. Purchasing

- b. Inventory
- c. Document filing
- 2) Financing and Accounting
  - a. Bookkeeping
  - b. Accounting
  - c. Budget control
  - d. Cash-flow management
- 3) Personnel and Transportation Management
  - a. Contract preparation
  - b. Operation of vehicles