Department of Public Works and Highways
Project Management Office
FLOOD CONTROL AND SABO ENGINEERING CENTER

Project for Strengthening the Flood Management Function of DPWH

Mitigation of water-induced disasters through improved effectiveness of disaster prevention facilities and structures constructed and/or maintained by the DPWH in accordance with technical standards guidelines and manuals

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OVERVIEW

The main role of DPWH is to provide vital infrastructures to this developing country of 7,107 islands. Mainly hampering the socio-economic development of the country are the various water-induced disasters brought about by its geographic and meteorological conditions.

The budget for flood control has remained small compared with roads and bridges during the past decades. While recognizing the contribution of road networks in inducing economic development countrywide, the importance of flood control and sabo engineering should be given a second look as this may well spare the populace, its livelihood and even various infrastructures from disasters.

The PMO for the Flood Control and Sabo Engineering Center implemented the Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH from January 2000 to June 2005 with the goal of providing sound and quality flood control structures and facilities. Through the Japan International Cooperation Agency assistance, the PMO-FCSEC has been able to substantially achieve this goal with the formulation and dissemination of technical standards, guidelines and manuals, training of DPWH Main/Regional/District/Project Management Offices and establishment of a damaged-structure database.

The Project for Strengthening the Flood Management Function of DPWH manifests the recognition of the DPWH and the JICA of the importance of enhancing the engineers in providing efficient disaster mitigation structures and strengthening the DPWH in performing such function with more database, researches, reference materials and appreciation of the role of various agencies in integrated work activities.

MESSAGE

The efficient delivery of services, particularly the construction of road networks nationwide to stir-up the country's socio-economic development, has always been a primordial concern of the Department of Public Works and Highways (DPWH). However, several instances in the past have shown our vulnerability to flood and other water-induced disasters which did not only bring havoc in the lives of the populace but also tremendous damage to properties and various infrastructures such as national roads and bridges.

It is with deep appreciation that the Government of Japan, thru the Japan International Cooperation Agency, has supported the establishment of the Flood Control and Sabo Engineering Center (FCSEC) in 2000 to serve as a medium in developing the DPWH in terms of its capability in flood control and sabo (erosion and sediment movement control) engineering. Through the implementation of the Project for the Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH (January 2000-June 2005), considerable accomplishments have been made. Various guidelines have been developed, technical manuals have been produced, DPWH personnel have been trained, damage-profile database have been established and preliminary researches have been conducted. These could well facilitate the development of DPWH engineers in handling water-induced disasters.

The five-year Project for Strengthening the Flood Management Function of the DPWH will provide a wider opportunity for the engineers of the FCSEC and other DPWH offices to further enhance their skills and expertise through the implementation of pilot projects, research activities, expansion of training and other activities under the technical cooperation.

The success of the Project and sustained development activities for the FCSEC and other DPWH offices will greatly contribute in building the capability of the DPWH in effectively implementing its flood mitigation infrastructure.

HERMOGENES E. EBDANE, JR.
Acting Secretary

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MESSAGE

I would like to extend my warm greetings and congratulations to the Flood Control and Sabo Engineering Center (FCSEC) of DPWH first, for the successful completion of the Enhancement of Capabilities in Flood Control and Sabo Engineering (ENCA Phase I) and second, for the commencement of ENCA Phase II which focuses on the *"Strengthening of the Flood Management Function of DPWH."*

As you know, the Philippines is astride one of the most striking natural disaster belts in the world and is ranked fourth in the frequency of water-induced disasters. Every year, water disasters in the Philippines claim hundreds of lives and loss of millions worth of property. Japan has long been assisting the Philippines in disaster mitigation through different initiatives. JICA in particular have dispatched experts and supported various projects to prevent further loss and damage due these disasters. The ENCA Phases I and II are testaments to JICA's support in improving DPWH's flood management functions.

JICA's cooperation with FCSEC started in 2000 with the launch of ENCA Phase I. In Phase I, we have achieved notable strides in improving FCSEC's technical and institutional capabilities through the production of manuals, conduct of research as well as training for FCSEC personnel. With Phase II, we hope to consolidate these achievements for a more effective FCSEC, more responsive to the needs of the Filipinos.

Lastly, we at JICA envision that with this project, FCSEC will become the leading institution for flood control and sabo engineering in the Philippines.

Maraming salamat at mabuhay kayong lahat!

SHOZO MATSUURA
Resident Representative

MESSAGE

The completion of the JICA-assisted Project for the Enhancement of Capabilities in Flood Control and Sabo Engineering in DPWH (Project ENCA), Phase I, in June 2005, has marked a modest accomplishment in upgrading the technical skills of engineers in planning and design of flood control and sabo structures (Stage 1) and construction and maintenance of flood control structures (Stage 2).

The implementation of the Project for Strengthening the Flood Management Function of DPWH (Project ENCA, Phase II) in the next five (5) years assures the sustainability of the project's gains aimed at developing skills and expertise of DPWH engineers in the various aspects of implementation of flood control structures.

The PMO – Flood Control and Sabo Engineering Center (FCSEC), in collaboration with other related DPWH offices, shall continue to conduct trainings and researches, develop database and information management system and undertake pilot projects which will institutionalize the expertise in flood, sediment and erosion mitigation.

We, in the PMO – FCSEC and the Regional and District Engineering Offices, therefore, are entrusted with a very important task of improving and sustaining effectiveness of disaster prevention facilities and structures constructed and/or maintained in accordance with technical standards and guidelines (TSG), & manuals developed through this Technical Cooperation Project of JICA.

RESITO V. DAVID, MNSA
Project Director

PROJECT FRAMEWORK

Project for Strengthening the Flood Management Function of the Department of Public Works and Highways

Super Goal
Water-induced disasters are mitigated through improved effectiveness of flood control and sabo structures and other measures implemented by DPWH for sustainable development.

Overall Goal
More effective and appropriately designed flood control and sabo structures/facilities are constructed by DPWH in accordance with technical standards, guidelines and manuals.

Purpose
The flood management function of DPWH is strengthened through research and development, training, information management, implementation of pilot projects and creation of the internal support mechanism.

Outputs
1. Pilot projects are implemented using the technical standards, guidelines and manuals
2. Research is conducted for developing/updating technical standards, guidelines and manuals, and assessing efficient countermeasures for flood control and sabo.
3. A sufficient number of personnel of DPWH are trained on flood control and sabo engineering
4. Information Management System is established for more effective flood management function of DPWH
5. DPWH creates the internal mechanism to sustain the development of technology and organization in the field of flood control and sabo engineering.

Project Duration
July 1, 2005 to June 30, 2010 (5 years)

Implementing Organization and Target Groups
The PMO-Flood Control and Sabo Engineering Center spearheads the implementation of the project, the target groups are the DPWH offices and personnel in the central office, regional and district engineering offices relevant to flood control and sabo engineering activities. People at pilot project sites and other disaster prone areas are direct beneficiaries of the project.

PILOT PROJECTS

Pilot Projects are implemented using the technical standards, guidelines and manuals

Procedures in planning, design, construction and maintenance of flood control and sabo structures recommended in the developed reference materials under the Project ENCA, Phase I shall be applied in the implementation of pilot projects.


Sta. Fe River, Nueva Vizcaya

Such pilot project implementation, to be jointly conducted with the concerned DPWH Regional/District Engineering Offices (ROs/DEOs), is intended to validate the applicability of the procedures. Salient points to be identified during the various stages of project implementation will be accordingly considered in the formulation of supplementary reference materials. After construction of pilot projects monitoring and evaluation of the performance of the structures will be undertaken. Considering some constraints in the implementation, potential pilot projects are identified and selected based on the following criteria:

CRITERIA	REMARK
Technical	Applicability of the TSG & manuals is tested or project period within four (4) years
Social	demand from DEO, LGU and beneficiaries
Accessibility	preferably near Manila
Peace and Order	security concerns
Budget	low cost


Digmala River, Brgy. Pesa, Bongabon, Nueva Ecija

Basin-wide approach will be applied, i.e., countermeasures in the upstream (sabo) and downstream (channelling works) will be considered in the preparation of plans.


Kinanliman River, Real, Quezon

Once completed, proper documentation from the planning to the monitoring stage will be prepared. These will be furnished to the ROs and DEOs nationwide as a reference in their implementation of flood control/sabo projects.

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RESEARCH AND DEVELOPMENT

Research is conducted for developing/updating technical standards, guidelines and manuals, and assessing efficient countermeasures for flood control and sabo

In the next five (5) years, PMO – FCSEC under its research and development activities shall pursue diversified scientific investigations.

Sediment transport, river modeling, and other critical experiments shall be conducted at the Hydraulic Laboratory, a research facility constructed under the General Grant-Aid Program of the Government of Japan with several objectives: (1) to support the activities of the PMO – FCSEC in planning, design, and training; (2) to benefit the DPWH Regional/District Engineering Offices, as well as other related offices and organizations, by sharing results and analyses of various hydraulic experiments; (3) to demonstrate hydraulic phenomena during training and visits.

The Hydraulic Laboratory has adequate facilities to conduct experiments relevant to flood control and sabo engineering: (1) wide flume; (2) rainfall apparatus; (3) two-dimensional flume; (4) debris flow flume; and (5) lahar flume/model of alluvial fan. In addition, the laboratory has equipment for soil testing and analysis, ancillary instruments/apparatus such as measuring gauges, as well as computer laptops and workshop equipment for the design and preparation of components for hydraulic models.

The Hydraulic Laboratory is open to the academe, consultancy firms, and other organizations, which require hydraulic experiments to understand flood dynamics, sediment movements and transport.

The laboratory shall also be utilized for the preliminary planning and design of the pilot projects to be implemented by PMO – FCSEC starting CY 2006.

The objectives of this output are: (1) to develop recommendations for the revisions/modifications/upgrading of the technical standards, guidelines and manuals; to recommend appropriate countermeasures based on actual field requirements; (3) to develop alternative low cost flood control and sabo structures; (4) to prepare reports on the usage/applicability of the technical standards, guidelines and manuals.

TRAINING

A sufficient number of personnel of DPWH are trained on flood control and sabo engineering

As part of its human resource development activities, FCSEC in coordination with AMMS implements the following training courses for engineers of the Project Management Offices, DPWH regional and district engineering offices:

- Training on Planning and Design of Flood Control Structures
- Training on Construction Supervision of Flood Control Projects
- Training on Maintenance of Flood Control and Drainage Structures

As much as possible, the training courses and materials are continuously developed/improved based on the actual training needs of the target participants. Site practicum/observation of the rivers and structures in the target regions are conducted to allow exchange of ideas between the participants and resource speakers on the river phenomena and analysis of damaged flood control structures.

In addition to the above training courses, training on sabo works will be conducted for selected regions.

Lecture

On-the-Job Training

Site Practicum

If requested, the training courses will be extended to the local government units and other national agencies. Finally, participants who have completed the above courses will be continuously monitored to identify their progress and other needs in their respective jurisdictions.

INFORMATION MANAGEMENT SYSTEM

Information Management System is established for a more effective flood management function of DPWH

The Information System per se is a tool in information technology to capture, transmit, store, retrieve, manipulate, or display information used as a basic approach in problem solving and decision-making processes.

The Information Management System as one of the outputs under the Project will provide awareness and concern on existing flood control measures either structural or non-structural measures. Good compilation of quality data/information is important in strengthening flood management function of DPWH, specifically in flood information and as reference in various activities.

The activities include:

1) Expansion of linkages/networks with other agencies and organizations to improve data sharing and information dissemination.
2) Organization's participation in meetings/seminars on flood control and sabo management with other related agencies once a year.
3) Upgrade/improvement of data collection, technical analysis, and compilation in the database.
4) Submission of Annual Report and issuance of FCSEC bulletin/newsletter twice a year.

At present, the FCSEC maintains a database on the profile of damaged flood control structures. It has also started the database for inventory of flood control projects and river jurisdiction maps for all DEOs nationwide.

INTERNAL MECHANISM

DPWH creates the internal mechanism to sustain the development of technology and organization in the field of flood control and sabo engineering

A Joint Coordinating Committee (JCC) chaired by the Assistant Secretary for Planning and composed of representatives from the various DPWH bureaus, services, PMOs, NEDA and JICA was created under Special Order No. 57 s.2005 with the following functions:

1. To supervise the annual work plan of the Project in line with the Project Design Matrix and the Plan of Operations.
2. To review the annual and overall progress of the Project and to evaluate the accomplishment of the annual targets and achievement of the objectives.
3. To find out proper ways and means for solution of the major issues arising from or in connection with the Project.

The JCC will also serve as the body to pass relevant resolutions to the DPWH Secretary for the sustainable development of flood control and sabo engineering in the Department.

A Technical Working Group created under Special Order No. 175 s. 2005 provides support services to the JCC.

To date, January 2006, Department Orders/Memorandum Circular have been issued by the Secretary directing the use of guidelines and manuals develop under the project, to wit:

DC No. 4 s. 2002	Technical Standards & Guidelines for Planning and Design of FC and Sabo Works
DC No. 2 s. 2003	Typical Design Drawings of Flood Control Structures
DC No. 5 s. 2003	Manual on Flood Control Planning
DO No. 28 s. 2005	Manual on Construction Supervision of Flood Control Projects
Memorandum 2005	Manual on Design of Flood Control Structures
Memorandum dated April 20, 2005	Manual on Maintenance of Flood Control and Drainage Structures

FCSEC Facilities

Dormitory Building will house participants of the flood control and sabo engineering trainings, seminars & conferences.

Administration Building is where the PMO–FCSEC staff conduct their daily activities and where lectures for training programs are conducted.

The **Hydraulic Laboratory Building** is a Grant-Aid from the Government of Japan, where laboratory works and research activities are conducted.

Administration Building

Mini Library contains books, development study reports, reference guidelines/manuals, river jurisdiction maps and other relevant books/materials.

Training Rooms serve as venue for training courses and seminars by PMO – FCSEC.

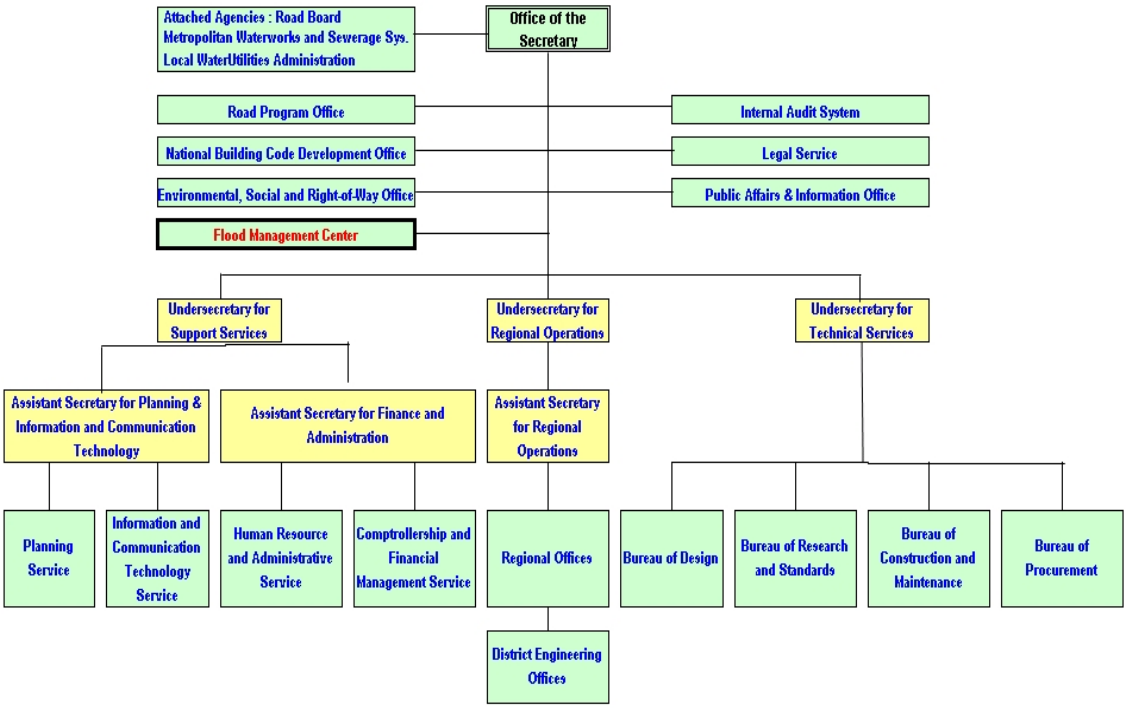
Conference Room is utilized as venue for meetings and orientations/briefings.

FCSEC under the DPWH Rationalization

The Flood Control and Sabo Engineering Center was established in December 1999 thru Department Order No. 237 for the implementation of the JICA Technical Cooperation Project for the Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH (Project ENCA) which commenced on January 11, 2000. The FCSEC was originally agreed with JICA to be established as a permanent institution in DPWH. However, due to the tedious process coupled with the time constraint prior to the start of the project, the idea of first creating the FCSEC as a Project Management Office was found to be more feasible.

After more than five (5) years after its creation, FCSEC has accomplished much under the project. Project accomplishments include standard guidelines and manuals, trained engineers of the selected Regional and District Engineering Offices, an established database on flood control and sabo, the initiation of hydraulic experiments (the first to be undertaken by DPWH) and now under the Project for Strengthening the Flood Management Function of DPWH, Project ENCA-Phase II (July 2005-June 2010), FCSEC will be implementing pilot projects in flood control and sabo utilizing the above project outputs.

Proposed DPWH Organizational Structure



Considering the above project accomplishments, FCSEC is proposed to be maintained in the restructured DPWH organization under the Rationalization Plan as the, Flood Management Center (FMC), a permanent office directly under the Office of the Secretary (OSEC). As originally envisioned, the permanency of the office will further strengthen the in-house capability of DPWH as it will serve as a core office in flood management with its present manpower resources and with its facilities (buildings, vehicles and equipment). It will also facilitate the institutionalization of capabilities in flood control and sabo engineering beyond the technical cooperation period through the formulation of policies and guidelines. The proposed office functions are as follows:

1. Conduct technical researches on water and sediment related disaster mitigation.
2. Formulate/undertake programs on capacity building in flood management and sabo engineering.
3. Prescribe guidelines for the conduct of post-disaster survey and assessment.
4. Supervise data collection and maintain database on flood and sabo management.
5. Evaluate the flood control system in river basin.
6. Provide technical assistance on water and sediment disaster mitigation.
7. Advise the Secretary on declaring flood control areas and recommend guidelines for flood plain management plans in these areas.
8. Perform other duties and responsibilities as may be assigned or delegated by the Secretary.

FCSEC EVENTS

DPWH Hon. Secretary Hermogenes E. Ebdane, Jr. with JICA Chief Advisor, Mr. Yoshio Tokunaga, Dir. Resito V. David, and FCSEC Staff after visiting the Hydraulic Laboratory and Dormitory Buildings.

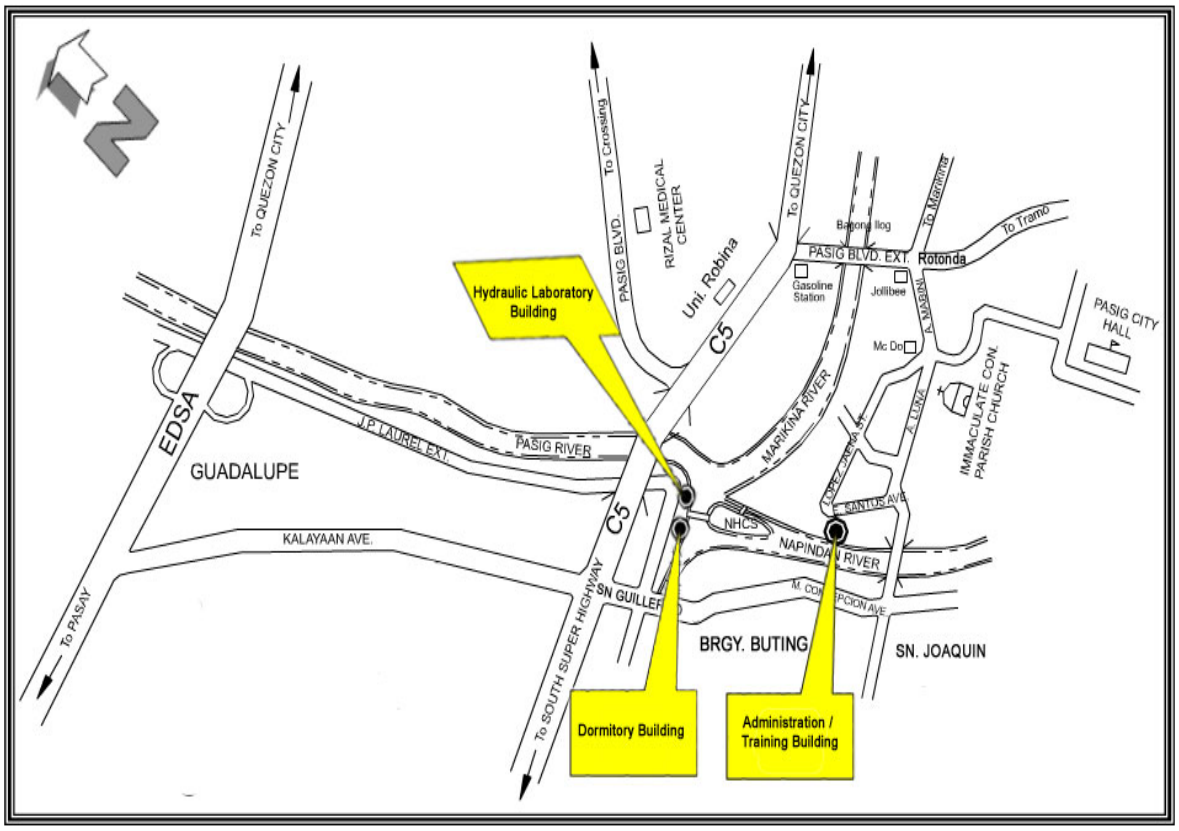
DPWH Hon. Secretary Hermogenes E. Ebdane, Jr., with **DPWH Assistant Secretary Raul C. Asis and Dir. Resito David**, during the presentation of FCSEC's project activities at the FCSEC Administration Building.

Demonstration of Hydraulic Laboratory facilities' capacities on hydraulic experiment/modelling to senior engineering students of Mapua Institute of Technology (MIT).

Signing of Memorandum of Understanding for the Project for Strengthening the Flood Management Function of DPWH, by **Undersecretary Manuel M. Bonoan** and **Dr. Junji Yokokura,** JICA Team Leader, Evaluation Study Team.

Farewell Party for **Mr. Toshiyuki Kano**, JICA Chief Advisor, **Mr. Hiroshi Tsuda**, JICA River Expert, **Mr. Shiego Watanabe**, JICA Coordinator, on June 28, 2005, which also marked the end of Project ENCA Phase I and commencement of Phase II.

Ribbon Cutting by **DPWH Undersecretary Manuel M. Bonoan** and **Japan Ambassador Kojiro Takano** during the Inauguration of Hydraulic Laboratory on July 17, 2003.



LOCATION MAP

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