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**Technical Cooperation in Surveying, Mapping and
Charting by Japan^{*}**

*** Prepared by the Government of Japan**

TECHNICAL COOPERATION IN SURVEYING, MAPPING AND CHARTING BY JAPAN

Government of Japan

SUMMARY

In the Japanese government, several organizations are responsible for fundamental surveying, mapping and charting projects. Basic geodetic surveys are carried out mainly by the Geographical Survey Institute (GSI) and the Hydrographic and Oceanographic Department (HOD), and various cartographic works are conducted by the GSI, the HOD, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the Geological Survey of Japan/AIST (GSJ/AIST) and other organizations. In order to provide technical assistance and implement the transfer of technology in the field of cartography, these bodies are actively engaged in various technical cooperative projects, implemented by Japan International Cooperation Agency (JICA), which is commissioned by the Ministry of Foreign Affairs (MOFA).

Technical cooperative activities in the fields of surveying, mapping, hydrography, oceanography and geoscientific research can be grouped into three categories namely : acceptance of trainees, dispatch of experts and cooperative projects.

1. Training

1.1 Training Courses in Surveying and Mapping

(1) Group Training Course in Planning and Management of National Mapping and Surveying (JICA)

At the Second United Nations Regional Cartographic Conference for Asia and the Far East held in Tokyo in 1958, the importance of professional education in surveying and mapping for technical personnel of developing countries was recognized. As an outcome of this conference, Japan started, after a five-year preparation period, a group training course in surveying and mapping was started in 1963. The curriculum of the course has been reconsidered and improved when necessary.

Especially in 1992, this group training course was largely reorganized to cover all fields of surveying and mapping technology, which had shown rapid progress, including geodesy, photogrammetry, cartography and map reproduction as well as Global Positioning System (GPS), Geographic Information System (GIS) and remote sensing.

This course was completed with a total of 335 participants from 60 countries during the period of 1963 to 1999, and was succeeded by a group training course as “Planning and Management of National Mapping and Surveying” in 2000. The new course was designed to support developing countries or regions to learn good practices of survey administration and project management, namely, laws and regulations, project planning and management, education and dissemination of information.

This training course, upon completion of the five-year cooperation term in FY 2004, was newly started in FY2005 with a strengthened focus on survey administration management under the same name of Planning and Management of National Mapping

and Surveying. Total number of participants from FY2000 to FY2008 was 77 from 38 countries. Collectively, 412 participants from 73 countries were participated between FY1963 and FY2008, in the group training course of mapping and surveying that implemented by JICA.

Table 1: Number of participants in Planning and Management of National Mapping and Surveying (JICA) (FY 2005-08):

Country	2005	2006	2007	2008	Total
Afghanistan		1	1		2
Bangladesh		1	2	2	5
Bhutan			1		1
Cambodia	1				1
Colombia				1	1
Guatemala			1		1
Kenya	1			2	3
Kiribati		1			1
Malaysia	1				1
Mongolia		1			1
Mozambique			1		1
Myanmar			1	2	3
Pakistan		1			1
Papua New Guinea				1	1
Philippines		1		1	2
Rwanda			1		1
Saint Lucia	1				1
Senegal		2			2
St. Vincent				1	1
Tanzania	1			1	2
East Timor	1				1
Uganda	1				1
Yemen			1		1
Zambia				1	1
Total	7	8	9	12	36

*In all tables in this report, each year represents Japanese fiscal year which starts from April of the year and ends in March of the next year.

(2) Group Training Course in Global Mapping (JICA)

A new group training course “Global Mapping-Contribution to Global Mapping Development by GIS” started in 2004 succeeding the former group course “Global Mapping” from 1999-2003. The new course aims at capacity building to promote Global Mapping project through transferring technologies of remote sensing and GIS. The cumulative number of participants of global mapping related courses from 1994 to 2008 reaches 94 people from 56 countries.

Table 2: Number of participants in the Global Mapping course (JICA) (FY 2006-08)

Region	Country	2006	2007	2008	Total
Asia	Indonesia		1		1
	Syrian		1		1
	Bhutan	1			1
	Yemen		1		1

Asia	Jordan	1			1
Africa	Gambia			1	1
	Swaziland	1			1
	Congo (Dem. Rep. of)			2	2
	Mauritius		1		1
	Mozambique		1		1
	Lesotho			1	1
Europe	Macedonia	1			1
	Romania	1			1
North-South America	Guatemala	1			1
	Honduras		1		1
	St. Lucia		1		1
	St. Vincent and Grenadines		1		1
Oceania	Cook Islands	1			1
Total		7	8	4	19

1.2 Training Courses in Hydrographic and Oceanographic Department

(1) From FY2006 to 2008, the HOD conducted one group training courses and several individual training courses under JICA scheme as follows:

(1-1) Group Training Courses in Hydrographic Survey

This group training course has been authorized by the FIG/IHO/ICA International Advisory Board as Category B Course pertaining to specialization in nautical charting, port and nearshore surveys since June 1, 1988.

- a. Purpose: This course is designed to improve the knowledge in modern theory and techniques of hydrographic surveying for technical personnel who currently engaged in port and near shore surveying.
- b. Duration: From May to December every year.
- c. Curriculum: The curriculum of the course includes lectures and practical components strictly complying with the requirements under the international standards of competence for hydrographic surveyors, M5 9th edition, 2007.
 - Lectures: Approx. 77 days
 - Practices: Approx. 10 days
 - Field/shipboard training: Approx. 36 days
 - Observation and study tour: Approx. 12 days

Table 3 : Number of participants accepted to Group Training in Hydrographic Survey (FY2006-08):

Country	2006	2007	2008	Total
Belize		1		1
China	1	1		2
Cote D'Ivoire	1			1
Guyana		1		1
Indonesia	1	1	2	4
Kenya	1	1	1	3
Malaysia	2	1	2	5
Micronesia		1		1
Morocco		1		1
Myanmar		1		1

Panama	1			1
Pakistan			1	1
Philippines	1	1		2
Syria		1		1
Total	8	11	6	25

(1-2) Individual Training

The HOD conducted individual training for the country of Philippines.

Table 4: Individual Training conducted in 2006-2007 for the Philippines

Country	Subject	Term
Philippines	Management of Hydrographic data & Equipment (including trouble shooting)	2006(2 months)
	Digital Compilation on Chart	2007(2 months)
	Analysis of tidal data	2007(1 month)

(2) From 2006 to 2008, the HOD conducted following two group training courses under the auspices of Japan-UNESCO Funds-in-Trust (JFiT) scheme:

(2-1) IOC/WESTPAC Training Course on NEAR-GOOS Data Management

- a. Purpose: This course is to provide personnel currently involved in oceanographic data management in the WESTPAC Member States with basic concept of the International Oceanographic data and Information Exchange (IODE) system and its function, NEAR-GOOS Real Time and Delayed Mode Data Base, and acquisition, procession and compilation of oceanographic data including how to operate "Resource Kit" set up by IODE as self-training tools.
- b. Duration: From February 20 to March 3, 2006.
- c. Curriculum: Curriculum of the training course includes lectures on outline of the international projects, and basic knowledge which is range from ocean physics to marine biology.
- d. Number of participants: 7 participants form China, Indonesia, Rep.of Korea, Philippines, Russian Federation, Thailand and Vietnam

(2-2)First NEAR-GOOS - NOWPAP Joint Training Course on Remote Sensing Data Analysis

- a. Purpose: 1) The training course was jointly organized by NEAR-GOOS of IOC/WESTPAC and Northwest Pacific Action Plan (NOWPAP) of UNEP/Regional Seas Programme, aiming to make the participants become acquainted with the concept of NEAR-GOOS and its function in the WESTPAC region, and
2) To contribute to capacity building for monitoring and assessment of marine and coastal environment in the Northwest Pacific Region through providing technical assistance of ocean remote sensing techniques.
- b. Duration: From September 3 to September 7, 2007.
- c. Curriculum: It consisted of lectures by specialists and hands-on practical sessions on analysis of satellite data. The course provided an overview of remote sensing of ocean color with special emphasis on applications of ocean color relevant to the Northwest Pacific Region.
- d. Number of Participants: 24 participants from eight countries which were China, India, Indonesia, Japan, Rep. of Korea, Russian Federation, Thailand and Vietnam.

1.3 Training Courses in Geosciences

Training of technical personnel from developing countries in geosciences is conducted as part of the technical activities at Geological Survey of Japan (GSJ/AIST), and GSJ accepts researchers in the general fields of geology geoinformation and geo-engineering.

2. Dispatching of Technical Experts

2.1 Experts in Surveying and Mapping (JICA)

In 1964, the GSI sent out four senior staff members for conducting survey to the national boundaries between Saudi Arabia and adjacent countries. Since then, the GSI has sent 348 seniors and experienced engineers as technical assistance experts. Among them 278 engineers were dispatched as short-term experts. In general, the period of dispatch range from several weeks to two months, to carry out particular projects based on requests to the Government of Japan from the recipient governments. Also a total of 70 long-term experts were dispatched. They usually stay longer than one year and cooperate with their host governmental organization by providing technical assistance.

Table 5: Dispatching of long-term experts (FY2006 – 2009)

Country	Subject	Term
Philippines	GEO-Spatial Data Administration, NAMIRIA	2004 - 2007
Kenya	Advisor, Survey of Kenya	2006 - 2008
Bangladesh	Expert in Mapping Technology, Survey of Bangladesh	2005 - 2007
	Advisor, Mapping of Bangladesh	2009 -
Timor-Leste	Advisor, Survey of Timor- Leste	2008 -

2.2 Experts in Hydrographic and Oceanographic Department

From 2006 to 2008, the HOD sent 5 staff members as experts in the field of hydrography. Among them 4 staff members were dispatched as short-term experts.

Table 6: Dispatching of experts after 2006

Country	Subject	Term
Philippines	Enhancement of Hydrographic Capabilities for Navigational Safety	2006-2008
Philippines	Organization assessment	2006
Philippines	Digital compilation on chart	2007
Philippines	Analysis of tidal data	2007
Philippines	Project evaluation	2008

2.3 Experts in Geosciences

The GSJ/AIST is involved in technical cooperation programs of the Japanese Government. The activities of the survey personnel in the geo-scientific and geo-technical assistance programs cover a broad spectrum of the geosciences, not only for mineral and energy resources but also for groundwater management, environment, environmental

geology, geohazards, and geoinformation technology.

3. Cooperative Projects

3.1 Mapping Projects (JICA)

In 1971, Japan has started its first overseas mapping project in Indonesia to prepare national base maps of the country. Such mapping projects in developing countries are conducted as technical cooperation by JICA. The role of the GSI in these overseas mapping projects is to give advice to both the authorities concerned in Japan as well as in the recipient countries on all aspects of surveying and mapping of the projects, and to supervise the survey project.

In general, the projects are assigned to a survey company in Japan for implementation by JICA. GSI provides technical guidance through the Advisory Committee and other meetings with authorities concerned.

Most of the projects are to prepare topographic maps as national base maps. In some cases, thematic maps such as land use maps are also made.

Table 7: Overseas Mapping Projects in progress as of 2008

Montenegro (Study on the formulation of Geographic information system)		
		2006 – 2008
Aerial Photo	1 : 40,000	14,000km ²
Digital Topographic Mapping	1 : 25,000	10,000km ²
Mauritania (Study on digital topographic mapping in the urban area of Nouakchott)		
		2007-2009
Aerial Photo	1 : 20,000	2,000km ²
Digital Topographic Mapping	1 : 10,000	1,200km ²
Afghanistan (The study on digital topographic mapping of the Kabul metropolitan area in Afghanistan)		
		2008 -2009
Aerial Photo	1 : 20,000	1,000km ²
Digital Topographic Mapping	1 : 5,000	395km ²
Ortho Photo	1 : 10,000	3,845km ²

3.2 Technology Development for ENC Projects for the country of Philippines

In response to the request of the Government of Republic of the Philippines, a technical cooperation project was conducted from 2000 to 2005 to carry out technology development for Electronic Navigational Charts (ENCs). The purpose of the project is to produce the ENCs and Electronic Notices to Mariners in the National Mapping and Resource Information Agency (NAMRIA), the Philippines, under JICA's technical cooperation scheme.

Since the dispatch of the preliminary study team to Philippines in 1999, the HOD has been involved in the project. In accordance with the agreement between the relevant authorities concerned with the two governments, the five-year project started in 2000. Government of Republic of the Philippines published the nine ENCs and three Electronic Notices to Mariners until December 2004 as the products of the project.

"Enhancement of Hydrographic Capabilities for Navigational Safety" project was conducted from March 2006 to March 2008. This project aims to enhance geodetic network and to enable Philippines to accomplish hydrographic capabilities, including

ENC production, digital paper charting, processing of survey data and tidal data collection processing in a consistent flow. NAMRIA has accomplished to strengthen their abilities on hydrography, nautical charting, and topographic mapping.

3.3 Geoscientific Map Projects

Geological Survey of Japan (GSJ/AIST) is actively engaged in international geoscience programs in collaboration with many foreign countries and international organizations. GSJ/AIST has been joining the Commission for the Geological Map of the World (CGMW) (http://ccgm.free.fr/index_gb.html). Also GSJ/AIST is doing with the OneGeology Project of which aim is to create dynamic digital geological map data for the world. (<http://www.onegeology.org/home.html>)

Web link pages (in alphabetical order):

GSI : <http://www.gsi.go.jp/ENGLISH/index.html>

GSJ : <http://www.gsj.jp/HomePage.html>

HOD : <http://www1.kaiho.mlit.go.jp/jhd-E.html>

JICA : <http://www.jica.go.jp/english/index.html>

MLIT : http://www.mlit.go.jp/index_e.html

MOFA : <http://www.mofa.go.jp/index.html>