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ASIA AND THE PACIFIC

Kuala Lumpur, 11- 14 April 2000

Item 6 of the provisional agenda\*

COUNTRY REPORT

Promotion of the Global Mapping Project

(Submitted by Japan)

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## Promotion of Global Mapping Project

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### ABSTRACT

The Global Map is the effective tool for understanding current status of the global environment and taking measures for sustainable development. In November 1998, the United Nations recommended the heads of National Mapping Organizations to participate in Global Mapping Project. At the end of 1999 the number of countries and regions participating in Global Mapping Project was seventy-one.

Target year of completion of the Global Map first edition is 2000. Distribution of the Global Map will also be begun in this year. Following is a report of ISCGM activities.

### I. INTRODUCTION

At the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, Agenda 21, an action program for addressing global environment challenges while continuing to support sustainable economic development, was adopted. Agenda 21 clearly mentions that there is need for improved coordination among environmental data and information activities, and it emphasized the transformation of existing information into forms more useful for decision-making. In particular, geographically specific spatial information is critical. Spatial information enables us to enhance our understanding of global and regional relationships inherent in present status and processes leading to changes in key components of global environment. And the Ministry of Construction of Japan advocated the Global Map concept in 1992.

The need of the Global Map for addressing global environmental problems has been well confirmed at the United Nations. The report of the United Nations General Assembly held in June 1997 includes a section on the development of an information infrastructure accessible to anybody, using technology of geographic information systems. This includes Global Map (refer to ANNEX 1).

In November 1998, the UN sent letter of Prof. Estes, Chairperson of ISCGM, inviting National Mapping Organizations (NMOs) to Global Mapping Project and recommendatory letter of Mr. Habermann, Director of The UN Statistics Division, to heads of NMOs. There has been remarkable increase of participation in the Project. As of 8 February 2000, seventy-four countries and regions have participated in the project, and more than thirty-eight countries and regions are waiting approval from their government (Figure 1).

Global Mapping Project has been carried out in cooperation with other

international activities, such as CEOS/WGISS, CERCO, GSDI, ICA, IGBP, ISO/TC211, MEGRIN, PCGIAP, SCAR-GGI and UNEP.

## THE GLOBAL MAP

### Principle of the Global Map

The Global Map was defined by International Steering Committee for Global Mapping (ISCGM) as a group of global geographic data sets of known and verified quality with consistent specifications, which is a common asset of mankind with scientific quality for world-wide distribution at marginal cost.

### Contents of the Global Map

The Global Map is the map covering the whole land area of the earth at 1km ground resolution, and consists of eight layers of geographical data, such as transportation, boundaries, drainage, population centers, elevation,

### Current Participation in Global Mapping Project

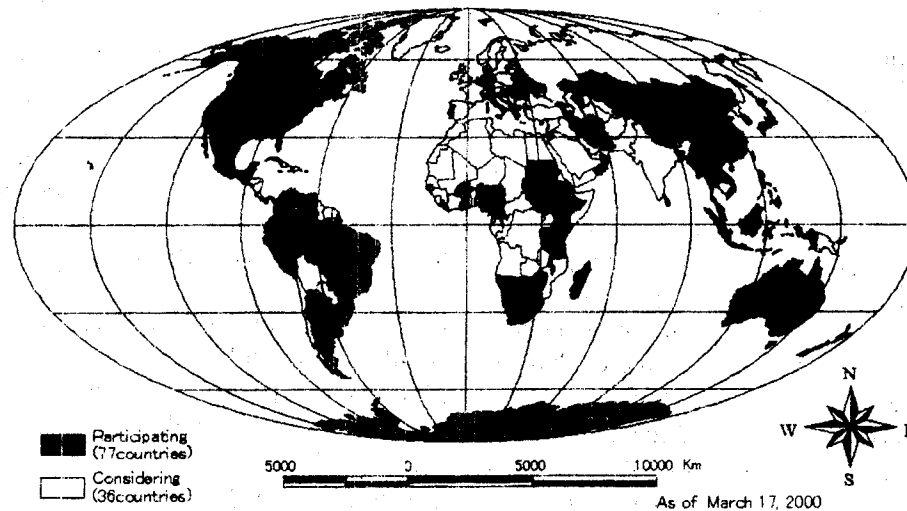


Figure 1

vegetation, land cover and land use.

The Global Map is being produced in a digital format for easy handling by Geographic Information System (GIS). Content of the Global Map is equivalent to conventional maps at the scale of 1:1,000,000, and it will be prepared by using existing data sets. Sample of the Global Map is shown in Figure 2.

## II. Global Map Specifications

The Global Map is to be produced based on Global Map Specifications version 1.0 which was adopted at the Fifth ISCGM Meeting in 1998 (ISCGM, 1998). The Specifications should be revised suitable for an International Standards which will be established by ISO/TC211 in the future. Following are main contents of the Specifications.

### (1) Vector and Raster data

Format of vector data is in Vector Product Format (VPF) by United States National Imagery and Mapping Agency (NIMA). And format of raster data is in Band Interleaved by Line (BIL) with separate header. The vector data and the raster data consist of four sub data sets respectively.

#### Vector data

Four sub data sets contain geographical features. Some of the features are mandatory and others are optional. Whether mandatory or optional is mentioned in the specifications.

#### 1) Transportation

The transportation contains airport, rail yard, railroad, road, trail and Tracks line, structures and transportation text.

#### 2) Boundaries

The Boundaries contain Administrative boundary, coast line, administrative boundary line, ocean / sea, administrative boundary and administrative entity text.

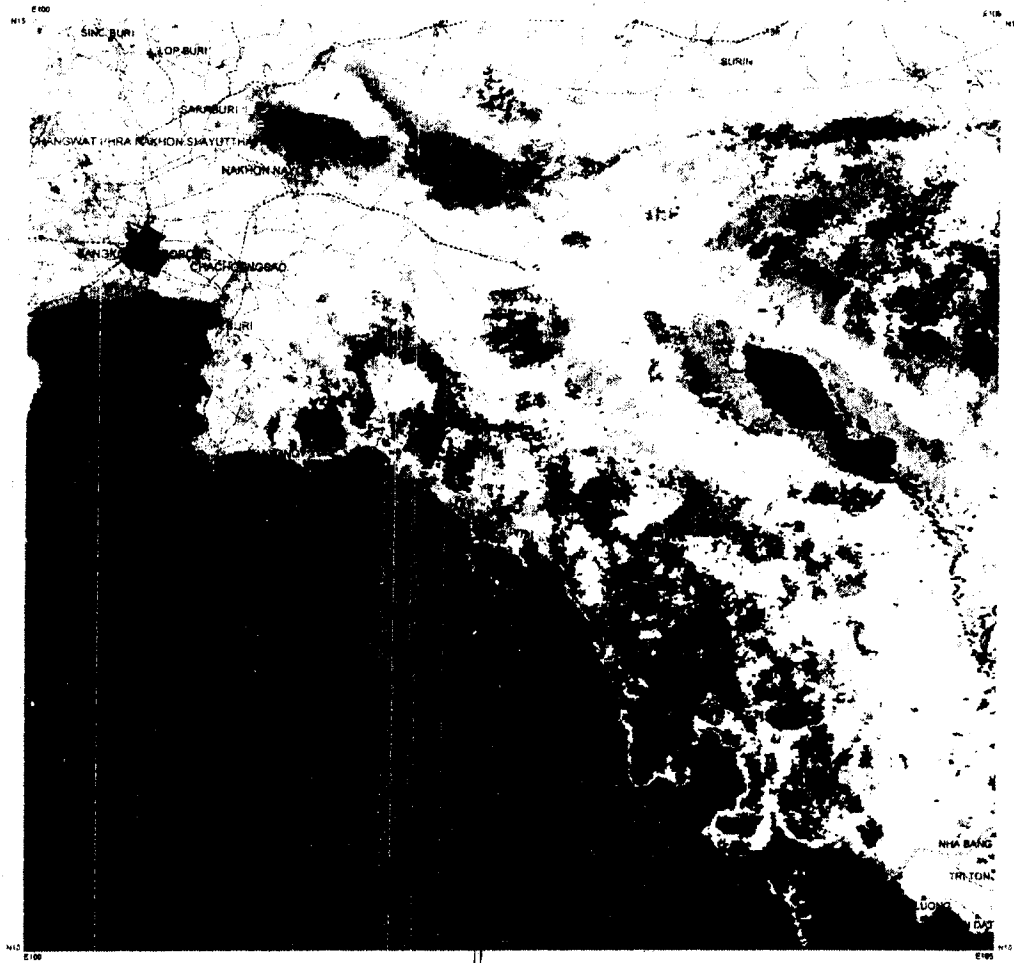
#### 3) Drainage (Hydrography)

The drainage contains miscellaneous, aqueduct/canal/flume/penstock, water course, inland water and water text.

#### 4) Population Centers

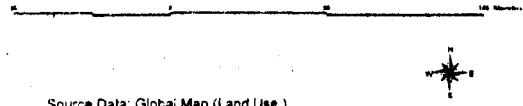
The population centers contain built-up area, miscellaneous, population, built-up area and population text.

# Global Map - Thailand - (Tile : UGLL)



### Legend

	Forest
	Urban
	Grassland
	Agricultural area
	Water
	Barren area
	Built-up area
	Drainage network
	Other



Source Data: Global Map (Land Use)  
Global Map (All Vector Layer)  
produced by GSI-JAPAN in cooperation with Royal Thai Survey Department

Figure 2

## **Raster data**

### **1) Elevation**

Vertical units represent elevation in meters above Mean Sea Level.

### **2) Vegetation**

Classifications of vegetation data are tropical rainforest (deciduous in dry season), hydrotropic forest (deciduous in dry season), grassland in tropical or sub-tropical zone, semi desert in tropical or sub tropical zone, desert in tropical or sub-tropical zone, evergreen thick-leaved forest, evergreen broad-leaved forest, deciduous broad-leaved forest, grassland in temperate zone, semi-desert interperate zone, desert in temperate zone, northern coniferous forest, tundra, water body, ice and snow, wetland, mixed forest, mixed land, non natural and unclassified. On condition that GSI produces vegetation data, GSI prepare the way of data conversion from Global Land Cover Characterization (GLCC) data set distributed through United States Geological Survey / Earth Resources Observation Systems (USGS / EROS) data center. This is the same in case of producing land cover and land use data sets.

### **3) Land Cover**

Classifications of land cover data are evergreen needleleaf forest, evergreen broadleaf forest, deciduous needleleaf forest, deciduous broadleaf forest, mixed forest, closed shrublands, open shrublands, woody savannas, savannas, grassland, permanent wetlands, croplands, urban and built-up, cropland/natural vegetation mosaic, snow and ice, barren or sparsely vegetated and water bodies. These are based on International Geosphere-Biosphere Programme (IGBP) classifications in GLCC data set.

### **4) Land Use**

Classifications of land use data are forest, mixture, grassland / shrub, agricultural area, wetland, barren area, built-up area, drainage / water and ocean.

## **(2) Geodetic Datum and Ellipsoid**

Current world geodetic system consists of global geocentric reference frame and ellipsoid which elements were determined by new satellite technology and astronomic careful observation such as Global Positioning System (GPS) and Very Long Baseline Interferometer (VLBI) with high precision. International Union of Geodesy and Geophysics (IUGG) and International Association of Geodesy (IAG) recommended the GRS80 ellipsoid should be used in world geodetic system. International organizations such as the United Nations Regional Cartographic Conference (UNRCC) for Asia and the Pacific, International Hydrographic Organization (IHO) and International Civil Aviation Organization (ICAO) recommended its member nations to adopt current world geodetic system. Each nation tend to change its own geodetic system to current world geodetic one.

Therefore, Global Map Specifications adopt combination of International Terrestrial Reference Frame 1994 (ITRF94) and the Geodetic Reference System 1980

(GRS80) ellipsoid as current world geodetic system. Data in the Global Map produced on current world geodetic system are suitable for use with GPS, because coordinates measured by GPS are based on geocentric system. Furthermore, without complicated coordinates conversion, we can easily use the Global Map with other data which are produced on current world geodetic system.

### **(3) Tiling**

To manage the large amount of data, the Specifications adopted tiling system. Size of one tile is five degrees in latitude by five degrees in longitude in case the tile is located between zero degrees and forty degrees in latitude. There is no overlap or gap between tiles.

## **III. ISCGM ACTIVITIES**

The necessity of establishing an international steering committee to coordinate Global Map was resolved at the International Workshop on Global Mapping held in Izumo, Japan in 1994. Then ISCGM was established in 1996 in Tsukuba, Japan to examine measures that concerned national, regional and international organizations can take to foster the development of Global Mapping.

### **(1) Members and Advisors**

ISCGM is composed of 17 members from 14 countries: Australia, Bangladesh, Canada, China, France, Iran, Japan, Kenya, Republic of Korea, Malaysia, Niger, United Kingdom and U.S.A. who are the heads of National Mapping Organizations and five advisors as representatives from international organizations and academic institutions. Besides, ISCGM keeps close relationship with GSDI, CEOS, ISO/TC211 and other related organizations.

### **(2) Meetings**

Since ISCGM was established, six meetings have been held as follows;

- \* First ISCGM Meeting in February 1996 in Tsukuba, Japan
- \* Second ISCGM Meeting in November 1996 in Santa Barbara, USA
- \* Third ISCGM Meeting in November 1997 in Gifu, Japan
- \* Fourth ISCGM Meeting in June 1998 in Sioux Falls, USA
- \* Fifth ISCGM Meeting in November 1998 in Canberra, Australia
- \* Sixth ISCGM Meeting in July 1999 in Cambridge, UK
- \* Seventh ISCGM Meeting on March 16, 2000 in Cape Town, South Africa
- \* Eighth ISCGM Meeting in 2001 in Colombia (To be determined)

Sixth Meeting of ISCGM was held in Cambridge, UK after the finish of Cambridge Conference in July 19 - 23. There were 61 people from 31 countries who

participated in the meeting. Discussions were held on the implementation plan of the first phase; formation of systems for the technical assistance to Global Mapping member countries and for data use of the Global Map; and framework building for the investigation towards the development of the second phase. In addition, liaison with GSDI, Digital Earth, etc.; participation of universities and private sectors; and validation and way of provision of the developed Global Map were also discussed. Forum for the promotion of Global Map Version 1.0 in 2000 was decided to hold. Main items resolved at the meeting of ISCGM are as follows.

- \* Establish liaison with other international organizations and private sectors as well as various initiatives such as Global Spatial Data Infrastructure, and extensively disseminate the significance of the Global Map to the world.
- \* Facilitate data development by sorting out specific tasks on the data development in this century.
- \* Start discussing the addition of new data items needed for the data development of the next century.

And refer to the resolution on sixth ISCGM Meeting (ANNEX 2).

Seventh ISCGM Meeting was held in Cape Town on March 16th, 2000. In the meeting, implementation plan of the phase 1, strategic plan, specifications and data policy were discussed. And there were reports from, GSDI, Industry, ISO/TC211, PCGIAP and SCAR and so on.

### **(3) Seminar and Forums for the Global Map data users**

To exchange view and information on the Global Map, the following three seminars and forums were held.

- \* Interregional Seminar on Global Mapping for the Implementation of Multinational Environmental Agreements in November 1996 in Santa Barbara, USA
- \* Global Mapping Forum '97 in November 1997 in Gifu, Japan
- \* Global Mapping Forum '98 in June 1998 in Sioux Falls, USA
- \* Global Mapping Forum 2000 in November 2000 in Hiroshima, Japan (scheduled)

#### **\* Global Mapping Forum '98**

Sixty-two persons from 15 countries participated in "Global Mapping Forum '98 -Information for the 21st Century-".

On June 16, the Forum was opened by Welcome Address of Dr. Lauer, Chief of USGS EROS Data Center, and Mr. Nagai, Secretary General of ISCGM. Dr. Anderson mentioned the objectives of the forum such as understanding of current status of global data and building partnership between national mapping organizations, academics, Non-Governmental Organizations (NGOs) and others. Mr. Loveland made Keynote Address on the achievement in global land mapping over the past few years, especially global land cover database recently developed. Following the Keynote Address, 11 presentations were made on specific themes, such as sustainable development and integration of physical and socio-economic data.



On June 17, Mr. Swift started the program of the Forum by presenting activities on ISCGM Specifications Working Group. Mr. Masaharu followed him by introducing the booklet on Global Mapping describing expected applications of the Global Map. After the presentation on environmental monitoring, assessment and management, panel discussion on themes of this forum was chaired by Mr. Holland. Several issues, such as a lack of good global data sets, new technology for updating the Global Map, necessity of standardization of data and metadata facilitating the use of the Global Map were presented.

In the afternoon, Dr. Lauer moderated the panel discussion of issues in Mapping for the 21st Century. Three panelists, Mr. Nonomura, GSI, Dr. Witmer, USGS, and Prof. Yang Kai, National Bureau of Surveying and Mapping (NBSM) of China, who are all members of the ISCGM, strongly supported the Global Mapping Project and stressed the activities in global scale should be core activities of national mapping organizations in the 21st Century. Finally, the Forum was wrapped up by the enthusiastic remarks of Prof. Estes, chairperson of ISCGM.

#### **\* Global Mapping Forum 2000**

Global Mapping Forum 2000 will be held in November, 2000. In this forum, we think that there should be presentations for applications of the Global Map by researchers. Through the presentations, we hope that more persons will know the way of effective use and importance of the Global Map. To have the researchers make the presentations, it is suitable for them to get data of the Global Map in advance. Near future, we will start distributing the data to researchers without fee. Of course, it is important for public to get the data. Now, we consider the efficient and convenient way of distribution of the Global Map to public.

I hope many persons will attend the Forum, but with your cost.

#### **(4) ISCGM Activities related the UN**

The Director of Statistics of the UN kindly invited governments in the world to participate in Global Mapping Project in November 1998. And to promote the project, it is important for us to keep close relationship with the UN.

Establishment of the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP) was adopted at 13th United Nations Regional Cartographic Conference for Asia and Pacific (UNRCC-AP), and the Fifth Meeting of PCGIAP was held from April 19-22, 1999 in Beijing, China. In the Meeting, we reported Global Mapping activities. On October 28, 1999, PCGIAP Executive Board Meeting was held at Melbourne, Australia, and we reported progress of Global Mapping.

Mr. Pinther, who is a chief cartographer in cartographic section in the UN, visited ISCGM Secretariat and GSI. And he and we discussed possibility of linkage between the UN Geographic Database Project and Global Mapping Project.

#### **IV. CONCLUSION**

We understand the significance of the vision of the United Nations to reduce the worlds poverty by half before the year 2015. We also recognize that the availability of fundamental geospatial data is vital for the development of options to address the challenge of sustainable development at local, national, transnational (regional), and global levels. In Cooperation with other international activities, we are going to make efforts for producing the Global Map as the effective tool of not only preserving good global environment but also taking measures for sustainable development.

#### REFERENCES

- \* ISCGM (1998) "Global Map Specifications "  
([http://www.auslig.gov.au/mapping/global\\_m/specv1\\_0.htm](http://www.auslig.gov.au/mapping/global_m/specv1_0.htm))

ANNEX 1

**Document adopted by the Special Session of UN General Assembly  
(Extraction)**

Programme for the further implementation of agenda 21  
Adopted by the Special Session of the General Assembly  
23-27 June 1997

C. Implementation in areas requiring urgent action

3.

Means of implementation

Information and tools to measure progress

Paragraph 112

112. A supportive environment needs to be established to enhance national capacities and capabilities for information collection, processing and dissemination, especially in developing countries, to facilitate public access to information on global environmental issues through appropriate means including high-tech information and communication infrastructure related to the global environment, in the light of country-specific conditions, using, where available, such tools as geographic information systems and video transmission technology, including global mapping. In this regard, international cooperation is essential.

(Note: Underline is drawn here)

ANNEX 2

UNITED NATIONS  NATIONS UNIES

UNITED NATIONS OFFICE AT ROME  
CABLE ADDRESS: UNISERV TEL: 06/54576101 FAX: 06/54576102

REFERENCE:

10 November 1998

Dear

The Director of Statistics of the United Nations is pleased to inform your government of an invitation to participate in the Global Mapping Project led by the International Steering Committee for Global Mapping (ISCGM).

The mandate for the development of global map products is clearly spelled out in the document adopted at the Special Session of the United Nations General Assembly on the status of Agenda 21 in June 1997. The Global Map Project is working to coordinate the development of digital geographic data sets. Products to be developed as part of the Global Map Project are also related to those called for in Chapter 40 of Agenda 21, "Information for Decision Making." In addition to the National Mapping and other organizations already participating in ISCGM, the United Nations Regional Cartographic Conferences for the Americas, and for Asia and the Pacific in 1997, all resolved to support Global Map development.

The Global Map Project is designed to make a fundamental contribution to the development of a Global Spatial Data Infrastructure. The Global Map product itself, and the products that may be derived from it will be of value to decision-makers as they seek to assess the status of and to monitor environmental conditions. It will also contribute to the establishment of conditions that will lead towards sustainable improvements in global environmental conditions. The attached letter and documents (Annex 1) from Prof. John Estes, Chairperson of the ISCGM, provide further information.

We in the International Community understand the importance of geospatial data. We also understand the key role National Mapping Organizations play in the production of such data. The need for improved geographically referenced data and information is clear. I hope you will seriously consider this invitation, and take the necessary action.

Thank you for your attention to this important matter.

Yours sincerely,



Hermann Habermann

Director

United Nations Statistics Division  
Department of Economic and Social Affairs

## ANNEX 3

### **ISCGM Resolution**

(Sixth ISCGM Meeting in Cambridge, UK in July, 1999)

ISCGM members understand the significance of the vision of the United Nations to reduce the world's poverty by half before the year 2015. We also recognize that the availability of fundamental geospatial data is vital for the development of options to address the challenge of sustainable development at local, national, transnational (regional), and global levels. Geospatial data are also critical as we seek to improve the social and economic well being of all citizens. As such ISCGM resolves to work to encourage the funding of and to promote relevant geospatial education, training, capacity building and appropriate technology transfer activities. We, the members, within our capacity, will continue the collection, preparation, distribution of geospatial data at local, national, regional and global levels. We will also continue to work to improve the quality of geospatial data products and to advance their exploitation for the benefit of all peoples