

ECONOMIC AND SOCIAL COUNCIL

**Nineteenth United Nations Regional Cartographic
Conference for Asia and the Pacific**

Bangkok, 29 October – 1 November 2012

Item 6(b) of the provisional agenda

**Conference papers: Invited papers on achievements and developments in
Geographical information management in addressing national,
regional and global issues.**

**Asia Pacific Countries Cooperate Closely to
Strengthen Geospatial Information Development***

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Asia Pacific Countries Cooperate Closely to Strengthen Geospatial Information Development

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I. Asia Pacific - A Region of Diversity and Vigor

The Asia-Pacific Region consists of three sub-regions in a broad sense: Asia, Oceania and the Pacific. Asia is the largest while Oceania is the smallest of the world's seven continents. The Pacific is the biggest and deepest ocean with the most islands. With the impact of the world financial crisis in 2008 and the dramatic change of the world economic landscape, the Pacific Rim region has become the most important region in the world economy.

The Asia-Pacific Region shows great diversity in geography, economy and culture. The population takes up two-thirds of the world's total. Many countries have a population over 100 million, such as China, India, Indonesia, Pakistan, Bangladesh, Russia and Japan. The cultures in this region are not only of a long history but also interwoven with each other. There are developed countries and newly industrialized countries, but most are developing countries. Natural resources are abundant in this region, but natural disasters such as earthquakes, tsunamis, and typhoons are frequent. With global climate change and excessive exploitation of resources, the regional ecological environment has become vulnerable, the tropical rain forest decreasing and the glacial ice melting. Economies in the Asia-Pacific Region are presently enjoying robust growth, but the growth is unbalanced with great disparity, the sustainable development faces much pressure, and there is still a hard way to go for poverty reduction.

II. Geospatial Information Development at Various Stages

Geospatial information development and application levels vary from country to country in the Asia-Pacific region due to different national economic conditions. Developed countries are building smart nations in an all-round way and some countries are

constructing digital nations, while the others still do not have adequate geospatial information coverage. The geospatial information industrialization is speeding up in the region. Japan, Russia, India and China have space and earth observation capabilities. Quality surveying and mapping instruments and devices are developed and produced in the region and possess a remarkable market share. Geospatial information is applied in broad areas and increasing attention is paid to geospatial information from all social sectors.

Basically, the level of geospatial information development can be reflected by the national SDI status. In 2011, the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP) conducted a survey on the SDI status of its 56 member countries. 19 countries responded to the questionnaire. 13 of them have a national and local hierarchical administration system of geospatial information management. Generally the national mapping agencies (NMAs) are under a ministry in their government system. Most NMAs are responsible for basic geospatial information, i.e. framework data or topographic data, while some also take charge of cadastral and/or land information. Indonesia, Japan and Korea have specific acts for NSDI. Two-thirds of the countries have made much progress in geomatics standardization and ISO standards adoption, and in most countries geospatial data is supplied through commercial GIS using ISO/TC211 standards. Almost all the countries hope that PCGIAP could form a regional geospatial information management framework to promote data sharing, knowledge and information exchange, collaborative study and leadership enhancement. At the same time, obvious problems exist in the Asia-Pacific region, mainly in terms of regulations, administration, investment, technology and human resources. It is an important task of the United Nations as well as the regional organizations to enhance the geospatial information management capacity of the member countries.

3. Global Geospatial Data - Built Separately, Shared Together

Regardless of national economic and social status, we all live on the one and only Earth; global change and human well-being concern all of us. Geospatial information is closely related to national economy. Developed countries have good geospatial data coverage and abundant funds, personnel, technology and equipment. Infrastructure construction has been basically completed in these countries. Therefore, there is not much change with the framework data and what they need to deal with are socio-economic changes and natural disasters. Developing countries have poor geospatial data coverage due to inadequate funds,

personnel and technology. More importantly, conventional surveying and mapping methods cannot meet the demand for data updating as ongoing infrastructure construction causes rapid changes. Another factor is that in developed countries the governments attach high importance to geospatial information development and the geomatics industry is stronger, while in developing countries the governments cannot provide enough funds to collect and update geospatial data and the industry also cannot meet the social requirements.

It should become a consensus that every government and every citizen can have access to appropriate geospatial information. Therefore, the importance of enhancing geospatial information capabilities of all the countries needs to be recognized from the global perspective. Every country should respond to the call of United Nations, join hands and cooperate for early realization of Digital Earth. To this end, efforts should be made in the following aspects:

3.1 Government support and legal framework. Government support brings about public funds and other resources. Government support can be obtained through raising awareness of top leaders as well as facilitation of the United Nations. Geospatial information relates to a nation's politics and economy, to planning, construction, supervision and evaluation, and also to the development of modern agriculture, industry and service sector. Government leaders keep changing, and so a legal framework is needed to sustain the support. It is necessary to analyze the practices in different countries and work out some reference models.

3.2 An open and authoritative platform. The value of geospatial information lies in its use. Conventional map production mode is not able to meet the needs of the network era. It has become a trend that every one can be a geospatial information producer and user. However, without government supervision, data quality and authority cannot be guaranteed. Therefore, every country should establish an open national geospatial information platform to promote data collection and service.

3.3 Open source data and standardization. Geospatial data, as a public wealth, is supposed to provide standardized spatial framework for all kinds of information. Public geospatial data should be open-sourced, and thus professional sectors such as agriculture, forestry, resources and environment can easily share information. Geospatial information should be standardized not only within a country but also in the world. Companies may have their own data, but such data should be interoperable with standard datasets.

3.4 Global earth observation system. With the advance of space, information and communication technologies, earth observation satellites can obtain high resolution images. Airborne remote sensing, especially the UAV platform, is an important method to acquire precision data. Ground mobile surveying systems have become a new method for location-based economic and social information acquisition. Space-borne, air-borne and ship-borne marine surveying platforms provide new tools for acquiring comprehensive earth information. Given that the Earth belongs to all the human beings, a global earth observation data sharing mechanism should be established in order to utilize the outer space peacefully.

3.5 Global geodetic reference system. To solve global issues needs global geospatial data, and such data needs to be of a unified geodetic reference system. Otherwise, it is impossible to integrate the data from different countries and sources, not to mention spatial analysis and assessment. Global Navigation Satellite System (GNSS) has made mobile object positioning and navigating possible, and has also provided a modern method for accurately measuring the earth shape and locations. Presently, many countries are modernizing their reference systems using GNSS, but unsolved problems remain with vertical datum and gravimetric datum. Only with cooperation of all countries in the world can a global geodetic reference system be established.

4. International Cooperation to Enhance Overall Capacity

Geospatial data production and service are major functions of NMAs of all the countries, but their capacity varies greatly. Efforts should be made in all means to enhance the national capacity in terms of reference system maintenance and geographic data acquisition, processing, managing, distribution and applications to meet the demand of sustainable development and emergency response. National governments, intergovernmental organizations and professional organizations have their roles to play in order to enhance the overall geospatial information management capacity of the world. Each country's own efforts are fundamental in capacity enhancement, but many developing countries still need facilitation and assistance from outside.

Firstly, international organizations can help enhance national government support for geospatial information management. The United Nations is the most important one and the UN-GGIM is the top force of outside facilitation. Organizations related to the UN, such as

FAO, UNESCO, World Bank and the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), should also make coordinated efforts.

Secondly, efforts can be made through regional organizations, such as Asia Pacific Economic Cooperation Organization (APEC), Association of South-East Asian Nations (ASEAN), Shanghai Cooperation Organization (SCO), and Asia Development Bank (ADB). Geospatial information management capacity development should be put on the agenda according to the UN resolution to get national government support. Regional bodies in the field like PCGIAP can act on this stage.

Thirdly, professional organizations, such as FIG, IAG, ICA, ISPRS and GSDI, can also play a role. They conduct exchanges in technology, personnel, standards, information and etc. to combine with the UN activities to improve the overall geospatial information management capacity of the world.

5. Innovative Mechanism for Stronger Collaboration

Enhancement of geospatial information capacity can speed up growth and reduce poverty in developing countries. However, due to the fact that geospatial information is a specialized and fundamental tool giving support behind the scene, government leaders often pays inadequate attention to it. Not only domestic financial investment is not enough, but international aid is seldom used in this field. Capacity development involves some major aspects, including personnel training, awareness raising, institutional strengthening as well as technical facilities, engineering projects, demonstrative applications and social services. Also very important are financial resources and necessary equipment.

Therefore, it is expected that the UN-GGIM and the regional organizations could take the initiative to organize a series of international cooperation programs and projects, mobilize more organizations and countries to jointly provide a package plan for management consultancy, financial assistance, technical support and personnel training, and facilitate multilateral and bilateral collaboration under a unified framework.

Geospatial information capacity enhancement is essential for achieving sustainable development. The mechanism of “built separately, shared together” for global geospatial information needs to be promoted at multiple levels by multiple organizations. However, capacity enhancement mainly lies with the countries themselves. There are big challenges to

confront in achieving this strategic goal, but with concerted efforts from all the countries, the day will surely come when geospatial information becomes the common wealth of humankind and is available for international issues, national development, industry growth and the general public life.