

UNITED
NATIONS

E



Economic and Social Council

Distr.
LIMITED

E/CONF.92/BP.7
11 April 2000

ORIGINAL: ENGLISH

FIFTEENTH UNITED NATIONS REGIONAL
CARTOGRAPHIC CONFERENCE FOR ASIA
AND THE PACIFIC

Kuala Lumpur, 11-14 April 2000
Item 9(k) of the provisional agenda*

THE ROLE OF RESAP IN THE APSDI

* E/CONF.92/INF/1

**15th United Nations Regional Cartographic Conference for
Asia and the Pacific (UNRCC-AP), incorporating the
6th meeting of the Permanent Committee on GIS Infrastructure for
Asia and the Pacific (PCGIAP)**

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by

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Remote sensing and APSDI

Since its appearance, the applications of geographic information system, or spatial information system, has achieved great success in spatial information related sectors worldwide. The rapid evolution of remote sensing technology has further promoted its utilization in fields as environment, natural resources management and sustainable development planning, etc. Along with its prosperous extensive applications, more and more countries in the Asia-Pacific region have taken initiatives to establish their national spatial information infrastructures to meet the challenges of the information age and the requirements for sustainable development. Against this background, the initiative of the establishment of the Asia-Pacific Spatial Data Infrastructure (APSDI) was proposed by the 13th United Nations Regional Cartographic Conference for Asia and the Pacific (UNRCC-AP) in Beijing May 1994. A regional spatial data infrastructure will indisputably contribute to the improved management of environment and natural resources, to sustainable economic and social development, and to the better quality of human life.

It is commonly recognized that an operational remote sensing application system would not be realized without an effective technical support of a spatial (or geographic) information system. Such a spatial information system, when integrated with multi-layer data of geodesic, environmental and ecological, natural resources, economic and social information, will multiply the value of remotely sensed data, and provide these data with a platform to bring into full play all their potentials.

Vise versa, the rapidly developing remote sensing technology, such as improved spatial, spectral and temporal resolutions and its extensive applications also provides increasingly important technical methods for the acquisition and updating of

information and data to be stored and utilized by a spatial information system, especially those data related to terrestrial phenomena with characteristics of dynamic changing.

The recent explosive progress in information technologies, particularly that in network technology and applications, has called for an ever-larger scale of information integration at ever-larger spatial and temporal spans. APSDI was proposed to meet this requirement in Asia-Pacific region. To reduce the unnecessary duplication at both national and regional levels, to meet the increasing demand of spatial data to support sustainable economic and social development in the region, the development of a consistent regional spatial information infrastructure will provide many benefits to help meet the challenges of the information era and globalization. The establishment of the infrastructure should be initiated by Governments in the region, and when more and more value-added services become available over this infrastructure, it could be utilized for crucial decision making on sustainable development.

The development and applications of a regional spatial data infrastructure will accelerate the operational applications of satellite based remote sensing, especially contributing to those problems with regional characters, such as:

- regional development planning;
- environment ecology changes;
- mineral and water resources development and management;
- food security and agriculture systems; and
- natural disaster prevention.

Satellite remote sensing has become one of the fundamental data sources and updating means for most sectors in need of spatial information. Satellite remote sensing can provide such data and information to be shared through an integrated spatial information system:

- topographic data by high spatial resolution and interferometric images;
- mapping of ecological and environmental situation and phenomena by high spectral resolution data;
- dynamic monitoring of natural hazards and crop vigor by high temporal resolution satellite images;
- marine dynamic and ecological factors such as ocean color, wave and temperature by oceanic as well as meteorological satellites.

In this way, satellite remote sensing, or more generally Earth observation technology has been recognized as one of the most important components of a spatial information infrastructure.

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) will, through the implementation of the second phase of Regional Space Applications Programme for Sustainable Development (RESAP II), cooperate with relevant international and intergovernmental organizations to promote the realization of this APSDI initiative.

ESCAP and the Regional Space Applications Programme for Sustainable Development (RESAP)

Promoting regional cooperation in effective applications of geographical information system technology in various environment and natural resources sectors for sustainable development has been one of the main efforts of ESCAP. It is commonly recognized that any executable sustainable development planning will rely on the effective integration and utilization of all relevant information, data and optimized decision-supporting models. Under ESCAP, a lot of activities and projects were conducted with the application of spatial information system technology in environment and natural resources management, and sustainable development areas. This paper only discusses activities in space applications.

In 1983, in response to the requests of its members to collaborate in space technology and applications, ESCAP established a Regional Remote Sensing Project (RRSP), with the support of UNDP. As a result of the success of RRSP, another project "Integrated Applications of Geographic Information Systems and Remote Sensing for Sustainable Natural Resources and Environment Management" was implemented by ESCAP. It was a natural outcome of the technological advancement. ESCAP, while implementing these two projects, has taken as the focus of its work, integrated application of remote sensing with geographic information systems.

Thanks to the active participation of ESCAP members, the successful implementation of the two projects had accelerated space development and applications in Asia-Pacific region, and led to the convening of the Ministerial Conference on Space Applications for Development in Asia and the Pacific in Beijing from 19 to 24 September 1994. The Conference launched the Regional Space Applications Programme for Sustainable Development (RESAP), with the mandate to promote regional cooperation in space applications for sustainable development in the region. Integration of remote sensing and spatial information systems was considered to be the most important space application field in addressing sustainable development.

Following the recommendations of the Ministerial Conference, the Space Technology Applications Section was set up under ESCAP.

RESAP was implemented by ESCAP through a three-tiered network, which was established for this purpose. This network was composed of:

- a) Intergovernmental Consultative Committee (ICC) comprising National Focal Point. The ICC, through its annual meeting, advises the ESCAP secretariat on matters related to the implementation of RESAP.
- b) Four regional working groups, comprising national contact points, in major space technology application fields: :
 - i) Remote sensing, GIS and satellite-based positioning;
 - ii) Satellite communication applications;
 - iii) Meteorological satellite applications and natural hazards monitoring; and
 - iv) Space science and technology applications.

The main objective of each regional working group is to develop a self-sustaining mechanism for promoting regional cooperation in its own field. Under each Regional Working Group there are several task forces and study teams on the topics of common interest for regional cooperation.

- c) Regional Information Service and the Education and Training Network, which has contributed to information exchange and human resources development in implementation of the RESAP.

A total of more than US\$ 5.5 million has been provided for the implementation of RESAP since 1994, inclusive of in-kind contributions from participating countries, amounting to US\$ 2.1 million. It is the increasing awareness and active involvement of member countries that has ensured the successful implementation of RESAP.

Various activities have been carried out under RESAP, with the emphasis on national capacity building. Most of them are related to the integrated applications of remote sensing and GIS technologies. These activities include:

- Education and training activities: 20 seminars/workshops involved more than 1000 planners and technicians from 48 members and associated members of ESCAP;
- 80 mid-term fellowships and 45 long-term ones;
- More than 50 publications for information exchange;
- 9 pilot projects;
- 18 task forces under four regional working groups;
- 3 policy studies.

Among these activities, two are directly related to the concept of a regional spatial information infrastructure.

In 1996, a policy study -- the Pilot Scale Feasibility Study on an Earth Space Information Network for Asia and the Pacific, was completed under RESAP. The purpose of the study was to explore the possibility of an operational regional Earth space information network over Internet that would assist access to, and distribution of, data and information required for planning and achieving sustainable development in the region. The study included identification of data and information requirements, network concepts and configuration, and the issues related to policy and institutional matters. The study suggested the establishment of such a network to address the requirements by member states, including: 1) better access to metadata and browser files of earth observation satellite data, and other related geo-spatial data of the ESCAP region; 2) more equitable distribution of data to make data available to more users, especially achieving the transfer of time-critical data sets during emergency; 3) ready access to geo-spatial data for coping with the problems of sustainable development, and natural hazards. Due to financial and administrative constraints, this proposal has not been put implementation. However, the requirements analysis and the basic considerations of the network will be useful for the APSDI initiative.

The task force of spatial information infrastructure development and applications, under the Regional Working Group on Remote Sensing, GIS and Satellite-based Positioning, has sent questionnaires to the members of the Regional Working Group to obtain information on the current status of spatial information

infrastructure development. Based on the information collected, the task force will propose further actions to be taken under RESAP II.

Although remarkable progress in space applications has been made in the Asia-Pacific region, there are still some issues to be addressed to further promote effective use of space technology, including spatial information system technology, for the solution of problems of regional significance, and to strengthen the capabilities of ESCAP members, in particular the developing ones, to use the technology for sustainable development purposes.

The Second Ministerial Conference on Space Applications for Sustainable Development and the RESAP II

The Second Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific was convened at New Delhi on 15-20 November 1999. This Conference is of crucial importance for the Asia-Pacific region in its continued efforts to enhance regional cooperation in space technology development and applications. Taking into account the recommendations of UNISPACE III, the Ministerial Conference developed a Strategy and Action Plan in light of the specific regional conditions. Through the adoption of the Delhi Declaration, an action-oriented and result-driven regional programme was initiated as the second phase of the Regional Space Applications Programme for Sustainable Development (RESAP II), which would be executed under the existing and strengthened three-tier network.

The second Ministerial Conference recognized that while significant progress in space technology applications had been made since the first Ministerial Conference in 1994, several outstanding issues at both the regional and national levels need to be addressed. Such issues as:

- deficient and intermittent financial support;
- absence of a long-term institutional mechanism at regional level to take up substantive regional projects;
- lack of a "critical mass" of trained personnel and resources;
- lack of awareness of the potential of space technology among planners and administrators;
- inadequate involvement of private sector and academic institutions; and
- the insufficient focus on institutional capacity-building

are directly related to the integrated applications of remote sensing and spatial information systems.

The Conference identified the Minimum Common Programme (MCP), which constituted the core components of RESAP II, aiming at synergizing efforts for the realization of the goals with regard to the following essential elements:

- environment and natural resource management;
- food security and agriculture systems;
- capacity building;
- human resource development and education;
- poverty alleviation;
- natural disaster reduction;
- health care and hygiene; and

- sustainable development planning.

The Conference recommended that any programme on space technology applications should place strong emphasis on raising awareness on the part of policy planners and decision makers and should involve all sectors at all levels of decision-making. The Conference also suggested that RESAP II, in conjunction with relevant organizations, should encourage the establishment of a regional spatial information infrastructure for sustainable planning and development, and should introduce space technology to develop a spatial information network for sound decision-making on project planning and implementation.

As a specific project proposal, the Conference suggested that RESAP II should consider planning, jointly with countries of the region and FAO, a regional multi-purpose environmental and natural resources information base for food security and sustainable development in ESCAP region. It is not difficult to imagine that once this kind of operational application-oriented remote sensing / spatial information system is set up over a consistent APSDI, how much duplication can be avoided.

The integrated applications of remote sensing and spatial information infrastructure was proposed as one of the main activities of RESAP II. For the successful implementation of the envisaged regional network, effective coordination and extensive cooperation among ESCAP members, as well as with international agencies, are indispensable. In view of this, ESCAP will continue its efforts to cooperate with all relevant agencies in the implementation of its space applications programme.

Conclusion

The establishment of the Asia-Pacific Spatial Data Infrastructure is an important initiative for sustainable economic and social development in the region. The integration of satellite remote sensing applications with this APSDI will be mutually reinforcing, for the benefit of the development and applications of the two technologies in the region for sustainable development. In this connection, ESCAP is willing to cooperate with regional organizations and initiatives such as PCGIAP and APSDI in identifying and organizing activities to promote regional cooperation in the establishment and operation of the regional spatial information infrastructure.