DEVELOPMENT OF NATURAL RESOURCE AND ENVIRONMENT INFORMATION TECHNOLOGY TILL 2015 AND ORIENTATION TOWARDS 2020

## THE PRIME MINISTER

*Pursuant to the December 25, 2001 Law on Organization of the Government;*

*At the proposal of the Minister of Natural Resources and Environment in Report No. 106/TTr-BTNMT of July 28, 2004,*

## DECIDES:

***Article 1.-*** To approve the strategy on application and development of natural resource and environment information technology till 2015 and orientation towards 2020 with the following principal contents:

## I. OBJECTIVES

1. To computerize the system of State administrative management over natural resources and environment up to Vietnam's e-government standards, raising the quality and efficiency of natural resource and environment management; to reform administrative procedures for the system of registration and licensing of natural resource exploitation and use as well as environment quality; and to create conditions for organizations and individuals to have access to information on natural resources and environment.

By 2010, the computerization of the system of State administrative management over natural resources and environment must reach the following specific objectives:

a/ The State management work in the Natural Resources and Environment Ministry's agencies shall be performed through direct information link to the local-area network of each domain in the sector;

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DECISION No. 179/2004/QD-TTg OF OCTOBER 6, 2004 APPROVING THE STRATEGY ON APPLICATION AND

b/ The procedures for registration and licensing within the operation scope of the natural resource and environment sector shall be carried out through the local-area network of each domain in the sector;

c/ The natural resource and environment management information networks shall be directly connected to the financial, banking, tax and treasury management networks for coordinated management of security transactions and financial management over natural resources and environment;

d/ The information on situation and registration system; documents, policies and laws as well as plannings and plans already decided and approved shall be publicized on the information network of each domain in the sector;

e/ The elaboration and adjustment of policies, laws and plannings shall be made on the basis of analyzing data in the database of each domain in the sector.

By 2015, the computerization of the system of State administrative management over natural resources and environment shall be effected on a uniform information network on natural resources and environment.

2. Equipment and technologies in service of investigation, survey, observation and cartography shall be gradually converted into digital-technology generations, ensuring the almost full automation of the reception of natural resource and environment data, and the automation of loading data into the database.

By 2010, between 50% and 100% of the equipment used in investigation, survey, observation and cartography shall be converted into digital technologies. Depending on the specific demand of each domain in the sector, by 2015, to raise the rate to between 70% and 100%, and by 2020, to complete the whole process of converting data-receiving technologies.

3. The national database on natural resources and

environment shall be fully integrated in the national information network on natural resources and environment, regularly updated, on-line connected to databases of the domains in the sector and between the central and provincial levels, and off-line connected to international and regional databases on natural resources and environment, playing the nucleus role in the national system of natural resource and environment supervision, forming the information infrastructure in service of State management, economic, social, defense, security, scientific research, education-training activities, and raising people's intellectual standards.

By 2010, to complete the building and integration of the database of each domain in the natural resource and environment sector with data standardized according to the national standards; to be regularly updated from local supervision systems and the national satellite photo-receiving station, and added with regional and global data; to be connected according to domains between the central and provincial levels to form the website of each domain in the sector, ensuring the requirements of State management over each domain and the provision of full data for national socio-economic, defense and security activities; firstly to experiment the integration of information of the database of each domain according to the designed national database on natural resources and environment.

By 2015, the national database on natural resources and environment shall be built by complete integration of the database of each domain in the sector in order to form the national information network on natural resources and environment, consisting of all present and historical data, data regularly updated from the central investigation, survey, observation and cartography network, from local management systems, from the national satellite photo-receiving station and international data-receiving stations; the system of databases and information networks on natural resources and

environment shall constitute a uniform system from the central to local levels, standardized according to the national standards, having means to absolutely ensure data safety and security; the database on natural resources and environment shall fully meet the State management requirements, reflect exactly the situation, evaluatethe use potential, make appropriate plannings on the use and forecast of environmental impacts and natural catastrophes in service of the demand for use of information for socio-economic development as well as defense and security maintenance.

4. To apply and develop information technology for solving specialized mathematic problems in order to raise the quality of processing of large volumes of data on natural resources and environment; raise the reliability of forecast of weather, climate, natural catastrophes and environment pollution.

By 2010, the application and development of information technology for solving the sector's complicated specialized mathematic problems should yield the following results:

a/ The establishment of a section for high-efficiency calculation with designed special-use hardware with high-speed processing and calculation, being capable of performing multi-processing and multi-tasks used for the whole sector; the development of a separate special-use software of each domain suitable to Vietnam's particularities.

b/ The operation of the national satellite photo-receiving station in service of supervision of natural resource and environment situation on the basis of periodically receiving several kinds of optic and radar photos, suitable to the common use of the whole country and exclusive use for the natural resource and environment sector; the development of a special-use software for processing aviation-satellite photos for natural resource and environment purposes.

c/ The operation of the system of global positioning stations (GPS) in order to provide information for raising the positioning and piloting accuracy in service of the natural resource and environment sector's specific demand for investigation, survey, cartography and observation and the country's use demand. The system's Hanoi-based central station shall be built as a laboratory for satellite-positioning technologies and receiving the earth exploration, survey and research-related data from other satellites.

d/ A laboratory for each domain in the sector with appropriate hardware and software to meet the demand for special-use information technology application and development in the domain.

By 2015, to complete the high-performance calculation laboratory, the laboratory for processing photo and geological data (of the national satellite photo-receiving station), the laboratory for processing data on positioning satellites as well as the earth-exploring, surveying and researching satellites (of the central GPS) for being put into operation strictly according to the designed functions for processing large volumes of data in analyzing situation and forecasting natural resources and environment; to enter into domestic and international cooperation on scientific research into the earth, provide data to the subjects that wish to use and develop natural resource and environment special-use information technology.

## II. STRATEGY'S PIVOTAL TASKS AND IMPLEMENTATION STEPS

1. To computerize the reception and updating of natural resource and environment data through investigation, survey, cartography and observation in the domains of the natural resource and environment sector.

The time for completing the computerization of investigation, survey, cartography and observation equipment for each domain is determined as follows:

a/ Land management: By 2010, to complete the cartography of cadastral maps with digital

technologies; to make maps on actual land-use situation and supervise the implementation of land-use plannings and plans with aviation-satellite photos.

b/ Water resource management: By 2005, to organize the reception of data on water source survey, water source use supervision and water environment quality observation from implementing agencies for loading them into the database; by 2015, to upgrade or furnish water resource investigation, survey, cartography and observation equipment using digital technologies.

c/ Geology and mineral management: By 2010, to computerize the system of supervising mineral exploitation situation from earth-surface and satellite-photo supervision stations; by 2015, to computerize the geological mapping based on earth-surface survey and cartographic data in combination with aviation-satellite photos; by 2020, to computerize the whole earth-surface equipment system in service of geological survey, exploration and cartography; to complete the computerization of geological survey, exploration and cartographic equipment.

d/ Environment: By 2010, to complete the observation system, the system of evaluating environment quality by telereconnaissance technologies; by 2020, to complete the system of earth-surface observation stations and environment quality evaluation with digital technologies.

e/ Hydro-meteorology: By 2005, to complete the system of receiving and processing data from air-space, weather radar and cloud photo-receiving stations; by 2020, to complete the upgrading of equipment of the whole hydro-meteorological cartography network with digital technologies.

f/ Topography: By 2005, to computerize the whole system of equipment for measuring coordinates, altitude and earth-surface gravity; by 2010, to upgrade the system of sea topography equipment with digital technologies; by 2015, to upgrade the system of measuring aviation-satellite photos with digital technologies.

2. To build the national database on natural resources and environment with the following steps:

a/ From now till 2005: To conduct feasible studies on designing a database on natural resources and environment, experimentally operate it, and build the standardized common-use geological database.

b/ From 2006 to 2010: To build component databases in the domains of land, water resource, mineral, environment, geology, hydro-meteorology and topography management according to uniform standards.

c/ From 2011 to 2015: To integrate the domains' component databases into the national database on natural resources and environment.

3. To organize the system of data-transmitting networks in service of specialized branches and provision of natural resource and environment data to meet the State management, socio-economic development, defense, security, scientific research, training and international cooperation demands as well as other demands of the society and communities.

The data-transmitting networks are designed and operated in parallel with databases with the following specific steps:

a/ From now till 2005: Each domain in the sector shall be designed with a specialized Intranet, connected to the server of the Ministry's Information Center and the server of the Ministry's office.

b/ From 2006 to 2010: Each specialized Intranet shall be put into operation, ensuring the link of dispersed specialized data at central and provincial level, the provision of data to meet State management demand and other economic, social, defense and security demands, connected to international information centers of their respective domains for the exchange of international cooperation data; specialized Intranets shall be inter-connected for exchange of data, and connected to

the Internet for provision of information to meet the common-use demand and the community's information demand.

c/ From 2011 to 2015: To completely build the national Intranet on natural resources and environment on the basis of connecting the domains' specialized Intranets (called the national information network on natural resources and environment).

4. To apply and develop information technology in order to raise the efficiency of solving specific problems on natural resources and environment along the direction of efficiently applying foreign special-use information technologies, encouraging domestic hardware and software technological solutions in order to raise the efficiency of processing large volumes of data and increase the reliability of their results with the following specific steps:

a/ From 2006 to 2010: To build a high-efficiency calculation laboratory being capable of solving mathematic problems that require high-speed calculation for processing large volumes of data in service of the whole natural resource and environment sector; to efficiently exploit the laboratory for processing photo and geological data, which is built in association with the national satellite photo-receiving station; to operate the laboratory for processing GPS satellite positioning data, which is built in association with GPS's Hanoi-based central station, to combine the reception and processing of data from the earth-exploring, -surveying and -researching satellites in service of the domestic demand for data.

b/ From 2011 to 2015: To raise the capability to process large volumes of data and the reliability of the received results; to settle at a higher level mathematic problems on analyzing natural resource and environment situation, natural resource use planning, forecast of natural and environment catastrophes caused by humans; to create hardware and software products for solving specific problems on natural resource and environment information.

5. To well implement the program on computerizing the State administrative management system (Program 112) in agencies in charge of State management over natural resources and environment; to closely combine it with the process of building the database on natural resources and environment, to build the national information network on natural resources and environment with the following specific steps:

a/ From now till 2005: To comprehensively computerize the clerical work for the Natural Resources and Environment Ministry's office and the provincial/municipal Services of Natural Resources and Environment, and create computerized management contacts among the Government, the Ministry of Natural Resources and Environment and the provincial-level People's Committees with regard to the State management over natural resources and environment.

b/ From 2006 to 2010: To computerize administrative activities with citizens in order to reform the administrative procedures in each domain of the sector; to register, grant, disseminate policies and laws, and publicize plannings in the natural resource and environment domain on the specialized information network.

c/ From 2011 to 2015: To computerize the State management over natural resources and environment at a higher level; to propose the formulation of policies and laws, approval of plannings, formulation of management decisions supported by the system of analyzing information in the database on natural resources and environment; to create direct links between the State's administrative agencies and citizens through the system of information networks on natural resources and environment.

6. To build the system of sufficient documents prescribing technical standards on natural resource and environment information and legal documents on management of natural resource and environment

information in the period from now till 2005, with the following tasks:

a/ To promulgate documents prescribing technical standards on natural resource and environment information;

b/ To submit to the Government for promulgation a decree on management of natural resource and environment information, clearly defining the responsibilities and interests of information-providing agencies, the responsibilities of information-managing agencies, the responsibilities and interests of information users, the legality of information, information ownership, information provision mechanism, regime on ensuring information safety and security, and introduce such system of legal documents into life.

7. To train information technology personnel to meet the quantitative and qualitative demands for implementation of the strategy on application and development of natural resource and environment information technology through implementing information technology programs and projects; to increase the content of training information technology on natural resources and environment at colleges and intermediate vocational-training schools under the Ministry as well as natural resource and environment faculties of universities; to provide specialized training on natural resources and environment to information technology experts working at the units in the sector; to disseminate information technology application knowledge on the sector's websites, to build a correspondence training system for the sector's officials in localities.

## III. MAJOR SOLUTIONS AS WELL AS KEY PROGRAMS AND PROJECTS

1. Major solutions:

a/ The formulation, approval and execution of projects must be based on the strategy's contents so that projects' products suit the systematism of the strategy;

b/ To promulgate sufficient legal documents as soon as possible so as to create a legal framework in the course of implementing the strategy, especially to soon prescribe the system of standards on natural resource and environment data;

c/ To mobilize different capital sources such as economic non-business, scientific non-business, capital construction, Program 112, official development assistance (ODA), foreign cooperation, etc. for execution of the strategy's programs and projects part by part; especially it is necessary to actively seek for ODA capital source for execution of big projects;

d/ To adopt a mechanism on encouraging software development and speeding up computerization in information technology application and development in the sector;

e/ To create a mechanism for coordination among the domains i      sector, between the central and local levels,         en the natural resource and environment s       and other sectors for cooperation in data infrastructure development, avoiding data sectionalism;

f/ To crea        ditions for the sector's domains to participate in       onal and global data cooperation activities in order to settle general issues on natural resources and     ironment.

2. Key prog       s and projects:

a/ The program on renewing the natural resource and environment investigation, survey, cartography and observation equipment and facilities along the direction of digital technology.

To continue executing the uncompleted projects, formulate new ones, ensuring synchronous investment from capital cons     tion (for basic surveys), economic non-business, s    ic non-business and ODA capital sources. The pi    m shall be completed by 2010, consisting of the following specific projects:

- The project in renewing observation and cartographic equipment in the system of hydro-meteorological stations.

To continue upgrading equipment and facilities at hydro-meteorological and oceanographic stations, ensuring synchronism and systematism by automation digital technology with capital construction capital source (for basic surveys).

- The project on building and renewing environmental observation equipment and facilities in the system of environmental observation stations.

To continue upgrading equipment and facilities at environmental observation stations, ensuring synchronism and systematism by automation digital technology with capital construction capital source (for basic surveys), economic non-business capital source for environment, and ODA capital source.

- The project on renewing geological and geo-physical investigation, survey and exploration equipment for geological federations

To continue upgrading geological and geo-physical investigation, survey and exploration equipment and facilities, ensuring synchronism and systematism for geological federations by digital technology with capital construction capital source (for basic surveys) and economic non-business capital source for geology.

- The project on renewing aerial photographing equipment, aerial laser-scanning equipment, sea-bed topographic equipment

To upgrade aerial photographing equipment by digital photographing technology or aerial laser-scanning technology, to substitute reverberated-sound depth-measuring equipment with ray-beam reverberated-sound scanning equipment in sea topography with capital construction capital source (for basic surveys), economic non-business capital source for topography, and ODA capital source.

- The project on building the national system of satellite photo-receiving and –processing stations

To build satellite photo-receiving stations and photo-processing stations and to develop the application of telereconnaissance technology in natural resource and environment supervision with the French Government's ODA capital source.

- The project on building the system of fixed GPS in Vietnam

To continue building 7 GPS which continuously receive signals from stationing satellites and re-transmit them in order to raise the stationing and routing accuracy; to build more 16 fixed stations which continuously receive signals from satellites in service of earth-crust shifting observation with capital construction capital source (for basic surveys) and ODA capital source.

b/ The program on building the national database on natural resources and environment

It consists of many projects, each of them shall be executed by a domain in the sector with contents on building the database for such domain or on database integration, to be executed from 2006 to 2010 with economic non-business and ODA capital sources:

- The project on modernization of the land management system

To computerize the land management system on the basis of building a cadastral dossier database, to be executed in the 2005-2010 period with ODA capital source.

- The project on modernization of the water resource management system

To computerize the water resource management system on the basis of building the database on water resources and water resource use, to be executed in the 2006-2010 period with ODA capital source.

- The project on modernization of the mineral management system

To computerize the mineral management system on the basis of building the database on minerals and mineral use, to be executed in the 2006-2010 period with ODA capital source.

- The project on building the geographical database

To build the geographical database for common use, to be executed from now till 2005 with economic non-business capital source.

- The project on building the hydro-meteorological database

To build the hydro-meteorological database, to be executed in the 2006-2010 period with economic non-business capital source.

- The project on building the environmental database

To build the environmental database, to be executed in the 2006-2010 period with economic non-business capital source.

- The project on building the geological database

To build the geological and geo-physical database, to be executed in the 2006-2010 period with economic non-business capital source.

- The project on building an electronic library on natural resources and environment

To collect all domestic, regional and international important documents, books, newspapers and data on natural resources and environment for the establishment of an electronic library to satisfy demands for information in service of State management and communities, to be executed in the 2005-2010 period with economic non-business capital source.

- The project on building the integrated database on natural resources and environment

To build the system of integration of all specialized databases into the national database on natural resources and environment, to be executed in the 2006-2010 period with economic non-business capital source.

c/ The project on building the website on natural resources and environment

To build an Intranet for each domain of the sector for integration into the national information network on natural resources and environment, to be executed from 2007 to 2015 with economic non-business and ODA capital sources.

d/ The project on computerization of the State management system (the Government's Program 112)

To build the State administrative management system along the orientation of an e-government (excluding the contents on building the database and data transmission network), to be executed from 2002 to 2010 (being under way) with the capital source of the Government's Program 112.

e/ The project on information technology application and development for solving specialized problems on natural resources and environment

To study and develop the information technology for solving specific problems on processing large volumes of data, to implement identification theory and artificial intelligence in interpreting the earth-related information, to increase the reliability of natural and environmental catastrophe forecasts as well as scientific research into the earth, to be executed from 2006 to 2010 with scientific and economic non-business capital sources.

f/ The project on elaborating legal framework documents on management of natural resource and environment data

To draft a government's decree on reception, universalization, management and use of natural resource and environment data; to set technical standards on natural resource and environment data, to be executed from now till 2005 (being under way) with economic non-business capital source.

**Article 2.-** To assign the Ministry of Natural Resources and Environment to assume the prime responsibility for, and coordinate with the Ministry of Post and Telematics, the Ministry of Science and Technology and concerned agencies in, implementing the contents prescribed in Article 1; coordinate with the Ministry of Planning and Investment and the Ministry of Finance in building the annual capital plan for implementation of this strategy.

**Article 3.-** This Decision takes effect 15 days after its publication in the Official Gazette.

The ministers, the heads of the ministerial-level agencies, the heads of the Government-attached agencies and the presidents of the provincial/ municipal People's Committees shall have to implement this Decision.

*Prime Minister*
**PHAN VAN KHAI**