

**NATIONAL LAND POLICY  
CHAPTER 2  
GEOGRAPHIC DATA MANAGEMENT SYSTEMS**

**1. INTRODUCTION**

The Government of Jamaica has recognized that to effectively manage the country's land resources, it is vitally important that a uniform, comprehensive and integrated National Spatial Data Infrastructure be created. Through this Infrastructure, the country's land and land related geospatial data can be integrated, and made readily available and accessible to all users.

A Spatial Data Infrastructure with these characteristics efficiently serves the interest of government organizations and other institutions responsible for effective decision making, sustainable planning and development as well as policy formulation and will also be of tremendous benefit to the entire society.

**2. GEOGRAPHIC DATA MANAGEMENT SYSTEMS**

Fundamental to the effective execution of policies aimed at optimizing the use of land is the knowledge of, and access to accurate, up-to-date, timely, complete and comprehensive geographic data. Geographic data encompass graphic and textual information on the natural and anthropogenic environment including natural resources, land use, utilities demography and socio-economic factors where such data can be related to geographic positions at or near the earth's surface.

Empirical data suggests that approximately 80 percent of government's administrative decisions are related to, or impact on, the geographic domain. To support informed decision-making, government and private organizations increasingly rely on Geographic

Data Management Systems (GDMS) to provide the procedures and technology to store, retrieve, process, analyze and display geographic data.

### **3. ACHIEVEMENTS IN THE GEOSPATIAL SECTOR**

- 3.1. Organizational Environment** – existence of GIS strategy, work plans, players – government, private sector, NGO, leadership/champion
- 3.2. Data Availability and Management** – fundamental data sets, maintenance, access and sharing arrangements
- 3.3. Funding** – annual budgets, project financed, loans, grants, public and private sector partnerships
- 3.4. Capacity Development** – skills base and levels, training and education options
- 3.5. Application Development**
- 3.6. Standards** – metadata etc
- 3.7. Geodetic Reference Systems and Projections**
- 3.8. Technology** – hardware, software, communication (networks, speed) etc.
- 3.9. Legal and Policy Framework** – legislation, GIS policies, etc.

### **4. ISSUES/CHALLENGES**

Some of the challenges remain as in previous years.

1. Inadequate senior executive support and commitment to develop, implement and maintain GIS.
2. The inability to garner greater public awareness and education on GIS related technologies, its uses and applications.
3. Difficulty maintaining and sustaining GIS operations, in the form of software and equipment upgrades, accessing technical support and providing improved GIS functionality.
4. Attrition and therefore migration of qualified and experienced GIS professional and therefore the need to continuously increase the skills pool.

5. Information hoarding resulting in difficulty accessing quality, complete and geo-referenced spatial data.
6. Lack of a national telecommunication infrastructure to transfer and exchange spatial data.
7. Perceived lack of political will/support for proper spatial data management.

## **5. POLICIES**

Government has adopted the following policies to:

### **5.1. National Spatial Data Infrastructure**

1. Establish a National Spatial Data Infrastructure (NSDI) for Jamaica by the Year 2020.
2. Create a national geospatial clearing house.
3. Encourage Government Ministries, Agencies and Departments (MDA's) to provide access to their spatial data sets through the national geospatial clearing house.
4. Encourage non-government organisations and the private sector to create, distribute and provide access to their geospatial data sets through the national geospatial clearing house.

### **5.2. Training and Education**

5. Facilitate the development of human resources required to manage and operate Geographical Data Management Systems (GDMS).
6. LICJ will be the body that develops and monitors professional quality and content standards for geoinformatics education and training.

### **5.3. Data Creation Access and Distribution**

7. Establish and monitor national standards for the creation, management and dissemination of geospatial data.

8. Encourage and facilitate the creation and maintenance of fundamental/framework spatial data sets as detailed in appendix 1, and as per national standards.
9. The National GIS Centre/LICJ will maintain a digital directory of available geospatial data sets.
10. Spatial datasets and services provided by Government Ministries, agencies and departments shall be made accessible at no cost or at reproductive costs to government entities to facilitate the performance of public tasks.
11. Encourage access to and reuse of spatial data to stimulate the development of value added spatial products and services by third parties (private sector, NGO's, academia).
12. International and local access to confidential and sensitive spatial data will be governed by approved guidelines and regulations.
13. Encourage the establishment and operation of discover, viewing and downloading services via the internet or other appropriate means of telecommunication to facilitate access to and ease of use of spatial data by the public. Access will be limited in cases of security, confidentiality and for the protection of the environment.
14. All digital data prepared by contractors and third parties for government projects will become the property of Government.
15. MDA's creating and disseminating geospatial data must contribute at least 10% of spatial data sales to the proposed National Mapping Fund
16. MDA's must create and maintain metadata according to national standards created for spatial data sets and services.
17. All distributed geospatial data must be accompanied by metadata.

#### **5.4. Legislation and Organisational Framework**

18. Enact National Spatial Data Infrastructure/Spatial Data Management Act
19. Establish a National GIS Centre with responsibility for managing and maintaining the national integrated GIS system.
20. Provide visionary, management and technical leadership required to encourage and sustain the growth of a national geospatial industry.

21. Encourage and provide incentives for geospatial data stakeholders to collaborate, develop partnerships, share data sets etc to facilitate the development of the NSDI.
22. Prepare and revise every 5 years a National GIS Strategic Plan.

### **5.5. GIS Application Development**

23. Facilitate the design, development and deployment of GIS applications to support national and mission critical applications in the areas such as emergency response, public safety, development approval, agriculture, policy planning and guidance.
24. Encourage the design and use of common geospatial data models to support national applications across stakeholder groups.
25. Encourage and facilitate the use of best suited and current technologies, hardware and software (web-GIS, GPS, wireless etc.) to manage and maintain GIS operations across government entities.

## **6. STRATEGIES**

| <b>POLICY AREA</b>          | <b>STRATEGIES</b>   |
|-----------------------------|---|
| Coordination and Monitoring | <ol style="list-style-type: none"> <li>1. Seek the cooperation and commitment of all relevant Government Ministries, agencies and departments, users and creators of geospatial data to the establishment and maintenance of the NSDI</li> <li>2. Encourage government departments and agencies to work together as teams rather than individual entities.</li> <li>3. Facilitate the involvement of the Private Sector in order to reduce prices, increase quality and fuel growth and development of GIS/NSDI</li> <li>4. Mandate that all relevant Government Ministries, agencies and departments, that create, maintain and use</li> </ol> |

| <b>POLICY AREA</b> | <b>STRATEGIES</b>   |
|--------------------|---|
|                    | <p>geospatial data must elect officers to serve as permanent representatives on the Land Information Council of Jamaica.</p> <ol style="list-style-type: none"> <li>5. Revise the national Geographic Information Systems Action Plan every five years</li> <li>6. Encourage the use of participatory GIS at the community level through the involvement of NGOs and CBOs among others</li> <li>7. Seek assistance from the Public Relations entities public and private sectors to prepare and implement a National SDI PR programme</li> </ol>  |
| Legislation        | <ol style="list-style-type: none"> <li>8. Develop and promulgate NSDI legislation to support a National GIS Centre/LICJ with responsibility for creating, coordinating and monitoring the NSDI</li> <li>9. The proper placement of the LICJ within the government as a statutory/ independent body</li> </ol>   |
| Technology         | <ol style="list-style-type: none"> <li>10. Lobby Ministry of Science Commerce &amp; Technology to establish government network</li> <li>11. Identify key players, strategic partners that can drive the process of creating a government wide network to support the distribution and exchange of spatial data.</li> <li>12. Establish strategic partnership e.g. Flow, Digicel etc. with telecommunication providers</li> <li>13. Identify and provide incentives for further investigation and research in the viability and use of open source GIS software.</li> <li>14. Explore possibility of government wide licencing of ArcGIS software</li> <li>15. Use of web GIS, GPS, remote sensing will be encouraged, enabling Jamaica to keep abreast of global technological trends relating to digital geographic information procedures, technologies and tools.</li> </ol> |

| <b>POLICY AREA</b>     | <b>STRATEGIES</b>  |
|------------------------|--|
| Data Sets              | <p>16. Spatial data shall be collected once and used many times</p> <p>17. A systematic plan will be designed for the rational and phased conversion of each agency's data</p>   |
| Spatial Services       | <p>18. Create and maintain a national clearinghouse with subnets/ Central repository</p> <p>19. Encourage access to spatial data by the general public</p>   |
| Education and Training | <p>20. Maintain an ongoing GIS training programme that is relevant to the user community</p> <p>21. Introduce GIS education into other tertiary and secondary level institutions</p> <p>22. Create a review board that regulates the content and quality of GIS education and training courses.</p> <p>23. A programme of on-going research and collaboration with relevant countries and institutions will be continued in order to keep abreast of technological advancements in NSDI and Geoinformatics</p> |
| Standards              | <p>24. Periodic review of existing Copyright and Access to Information Acts to determine appropriate amendments for protecting digital data creators and providers.</p> <p>25. Data sets created by government entities on any GIS platform should be harmonized and interoperable</p>   |
| Metadata               | <p>26. Provide incentives to encourage the creation and maintenance of metadata</p>  |
| Human Resources        | <p>27. Lobby to have established a GIS Job classification/Grade</p> <p>28. An integrated approach to staffing will be developed, including the formation of a core cadre of professionals and technicians, to support geographic information systems technology.</p>   |
| Financing              | <p>29. Approaches will be made to access funding for these projects from various multi-lateral and bilateral sources.</p>  |

## **7. STATUS ON THE CREATION AND MAINTENANCE OF SPATIAL DATA BASES**

### **Base Maps**

A digital topographic map of the Kingston Metropolitan Area is being developed at a scale of 1:2,000 by the NLA.

A digital topographic database has been construction from 1:50,000 scale base maps by the NLA. The database is being updated using LIDAR imagery.

### **Cadastral**

The NLA has created a digital cadastral database.

An expanded digital database to include location, size, existing and future land uses, and property tax will be developed by the Urban Development Corporation for its land holdings. A second database will be prepared for all its development plans and drawings.

### **Soils**

The Rural Physical Planning Division maintains a digital soils, land cover/land use, land capability and crop potential GIS database. The division intends to map the fertility status of soils and prepare a fertility capability classification system for some areas in Jamaica.

### **Forest**

The Forestry Department digital forest database is used to maintain and manage an inventory of forest reserves and plantations

### **Environment**

The International Centre for Environmental and Nuclear Sciences (ICENS)- UWI- Mona maintains a spatial database of the elemental content of soils, rocks, sediments, foods grown in Jamaica, air particulates, water quality parameters for select basins and near shore environments, and human and animal tissue. The data are used in research programmes that increase our understanding of the Jamaican environment, and issues related to sustainable development, which can impact on economic and policy decisions in agriculture and forestry, environmental protection, natural resource utilisation, nutrition and health, and land use planning. The database is maintained as a national resource, available to individuals and organizations interested in collaborating, and will

increasingly become critical in our efforts to improve the standard of living of the Jamaican people.

### **Utilities**

Jamaica Public Service Company created and maintains a spatial database of customer locations, power generation facilities, meter reading route maps, transmission and distribution assets (power lines).

Utility geographic information systems are being developed by the Jamaica Public Service Company, National Water Commission, and Telecommunications of Jamaica in support of facilities mapping analysis for planning, operations, maintenance, and engineering.

### **Water Resources**

Water Resources Authority (WRA) maintains spatial databases to generate, flood plain maps, vulnerability risk maps, watershed delineation, ground and surface water flow direction, water quality atlas, hydrostratigraphy and water resources location maps among others.

An monitoring system for surface and ground water resources including determination of the extent, reliability, quantity and quality of major streams, and ground water sources in all watershed Management Units is being implemented by the Water Resources Authority.

The WRA is now implementing an internet database which will allow for access to the data by users with password from the Authority.

Additionally datasets and thematic maps will be hosted by a WebGIS platform that will be easily accessible by individuals and students of institutions, which include primary, secondary and tertiary institutions.

### **Water Supply and Sanitation**

An integrated water supply network and sewerage system using the Automated Facilities Mapping System will be developed within the next 5 years by the National Water Commission. This will facilitate analysis of facilities performance, potential impacts of land development on water supply and sewerage systems, scenario modeling of production/distribution cost minimization, and an integrated customer service billing database. A pilot project in the Greater Mandeville Water Supply Scheme will commence in 1996.

### **Irrigation Water Supply**

### **Socio-economic**

Socio-economic spatial and aspatial databases including Population and Housing Census data will be developed by the Planning Institute of Jamaica and the Statistical Institute of Jamaica.

### **Health**

The Ministry of Health Jamaica created the GIS application, HealthGIS Jamaica in June 2002. The HealthGIS application has been developed by the Ministry to permit greater analysis of health related data throughout the island at both national and local level. It is used to create, capture, edit, analyse and display health related data to see possible trends, correlations and areas of concern. The health related data includes Violence Related Injury (VRI) and Disease (Gastroenteritis, Typhoid, Malaria, Tuberculosis etc.) Sex Worker Sites, Drinking Water Quality and Mosquito Breeding Sites. The VRI and disease data mainly come from the hospitals Patients Administration System (PAS) and Jamaica Injury Surveillance System (JISS), while the other datasets are capture using Global Positioning System (GPS) Technology.

### **Land use**

Digital land use maps are being developed by the Town Planning Department for all urban areas, growth centers, and townships. This will form the basis for the preparation of Development Plans for the six planning regions:

- i. Hanover - St James - Trelawny
- ii. Westmoreland - St Elizabeth
- iii. St Ann - St Mary
- iv. Manchester - Clarendon
- v. St Thomas - Kingston and St Andrew - St Catherine; and
- vi. Portland.

### **Planning**

A comprehensive tracking and processing system to better manage the processing of development applications and compliance with building and subdivision regulations is being developed by the Ministry of Local Government and Works (Local Government) in collaboration with Parish Councils through its programme of Local Government Reform. This will incorporate the Development Control Tracking System (DCTS) that has been in place in the Town Planning Department since 1988.

To improve the quality of its housing and land information data, the Ministry of Environment and Housing will embark on a programme to map, develop and maintain a property register for all parcels of land owned by that Ministry.

**Minerals**

A bauxite land data system using the Land Valuation Maps as a base to store information on ownership, use, and status of bauxite lands is being developed by the Jamaica Bauxite Institute.

**Geology**

A 1:250,000 digital topographic base and geo-physical base maps have been completed. A digital geological base map is being developed at scale 1:50,000 by the Geological Survey Department, which is expected to be completed by December 1996.

**Hazards**

The digital hazard database on storm surge, prepared with the assistance of the Organization for American States, will be expanded by the Office of Disaster Preparedness, to include landslide, seismic data, and flood lines information on a scale of 1:12,500. This database will form the basis for a digital natural hazard mitigation plan and later used in the development of a technical hazard map of high risk areas for vulnerability and risk assessment. The database will be used by the Town Planning Department and Parish Councils for planning purposes and will be publicly available to advise and guide building and development applications and persons involved in property insurance.