Sri Lanka National
Spatial Data Infrastructure

Supporting Sustainable National and Local Development

POLICY, GOVERNANCE AND STANDARDS STUDY

Volume 2 0f 3

Governance Model and Processes

FINAL REPORT

30 November, 2016

GPCGIS
A Global Network of Information Professionals

Sri Lanka National Spatial Data Infrastructure

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Volume 2 of 3
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SL-NSDI - ICTA/GOSL/CO/IC/2016/64

Prepared for

Information and Communications Technology Authority (ICTA)

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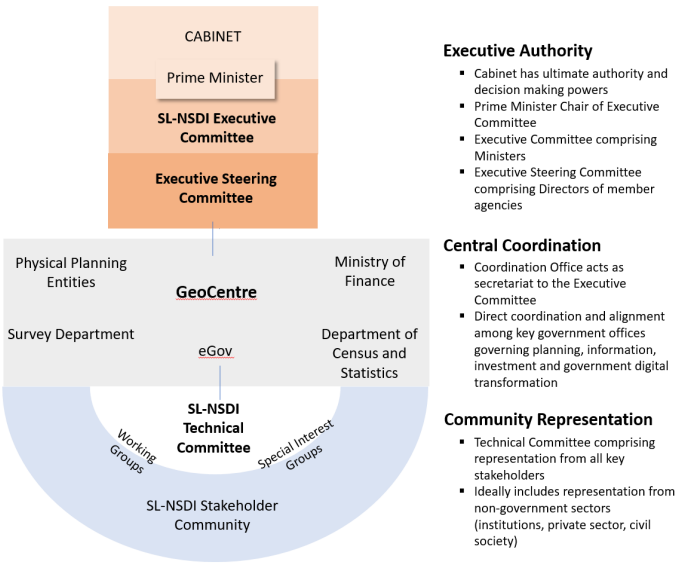
EXECUTIVE SUMMARY

This report summarizes the Governance Framework and Procedures for the Sri Lanka National Spatial Data Infrastructure (SL-NSDI) programme. This report is one of three volumes that together comprise the "Policy, Governance and Standards" report as follows:

Vol 1 – SL-NSDI Policy Framework
Vol 2 – SL-NSDI Governance Model and Processes (current document)
Vol 3 – SL-NSDI Standards Framework Development

As outlined in this document, the SL-NSDI programme is to be governed as a "whole of government" permanent function of government under an Executive Committee comprising members of the Cabinet and an Executive Steering Committee comprising Directors of member agencies. A "GeoCentre" office will function as the secretariat to the Executive Committee, performing the day-to-day activities required to facilitate, support and promote a multi-sector community of stakeholders. Beyond data sharing, the SL-NSDI is being structured to very directly support effective national sustainable development, investment, streamlined and transparent government operations, and the strengthening of capacity and innovation across institutions of higher learning, civil society and the private sector. As such, the SL-NSDI is to be developed and operated in such a manner to provide a "Smart Development Infrastructure (SL-NSDI+)" supporting the development and advancement of the Country. The GeoCentre will play an important role in facilitating coordination and data sharing across the stakeholder community, but will also have an important role to support the analysis and alignment of sustainable development planning and investment across government.



A Technical Committee comprising representatives of all the participating organizations will interface with the GeoCentre to coordinate with others and ensure that the individual and collective needs of the community are being met.

In addition to the overall organization of the programme, the report also defines the organization and staffing requirements for the GeoCentre and a detailed listing of the functions to be carried out. Finally, a series of Annexes provides model agreements, templates and standard operating procedures that are needed to support the initial setup and operation of the SL-NSDI programme.

List of Abbreviations and Acronyms

CINTEC		Council for Information Technology (CINTEC)
DMC		Disaster Management Centre
FGDS		Fundamental Geospatial Data Sets (FGDS).
GeoCentre		An operational centre established to facilitate, promote and support the day-to-day running of the SL-NSDI programme. The GeoCentre acts as a Secretariat to and under the direction of the SL-NSDI Executive Committee.
Geomaturity		Geomaturity is a measure of the level of technical and institutional development in regards to the use of GIS technology in an organization.
Geoportal		Web-based portal for discovering, accessing and viewing GIS data services
Geospatial Data		"Geospatial data" means information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies. Statistical data may be included in this definition at the discretion of the collecting agency.
GIS		Geographic Information System
GPS		Global Positioning System
GSL-NSDI		Global Spatial Data Infrastructure
ICT		Information and Communication Technologies
ICTA		Information and Communications Technology Authority
IP		Internet Protocol
IT		Information Technology
ISO		International Standards Organisation
ISO/TC		International Standards Organisation/Technical Committee
ISP		Internet Service Provider
LGN		Lanka Government Network
National Geospatial Data Clearinghouse		The "National Geospatial Data Clearinghouse" means a distributed network of geospatial data producers, managers, and users linked electronically
NMP		National Map Portal
NSL-NSDI		National Spatial Data Infrastructure. An institutional and technical framework for coordinating and sharing geospatial information across a stakeholder community.
OECD		Organisation for Economic Cooperation and Development
OGC		Open Geospatial Consortium
PDF		Portable Document Format

RDBMS		Relational Data Base Management System
RTI		Right To Information
SDD		Spatial Data Dictionary
SDE		Spatial Data Engine
SL-NSDI		Spatial Data Infrastructure
SL-NSDI		Sri Lanka National Spatial Data Infrastructure" (SL-NSDI) means the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data
SME		Subject Matter Expert
SOA		Service Oriented Architecture
TOR		Terms of Reference
UN		United Nations
VGI		Volunteered Geographic Information
WofG		Whole of Government
WFS		Web Feature Service
WMS		Web Map Service
XML –		eXtensible Markup Language

1 INTRODUCTION

This report represents the "Governance Model and Processes" component of the "Policy, Governance and Standards Study" portion of the Sri Lanka National Spatial Data Infrastructure (Sri Lanka NSL-NSDI) program which is currently underway. This is one of several components being carried out by different teams in a series of parallel and overlapping activities that are intended to expedite the planning, design and development of the foundation program and system for the Sri Lanka NSL-NSDI.

The ICTA has developed a conceptual model for the NSL-NSDI as represented in the following figure:

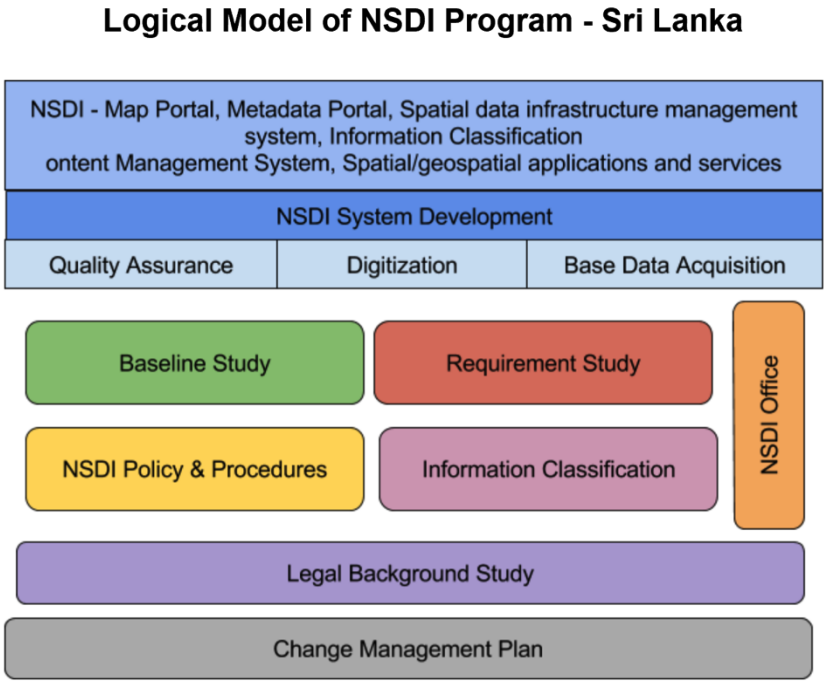


Figure 1 - Logical Model of Sri Lanka NSL-NSDI Program

The individual efforts and their interdependencies as defined by the ICTA are illustrated in the following figure. The position of this Policy, Governance and Standards Study (Policies and Procedures) is highlighted in the diagram.

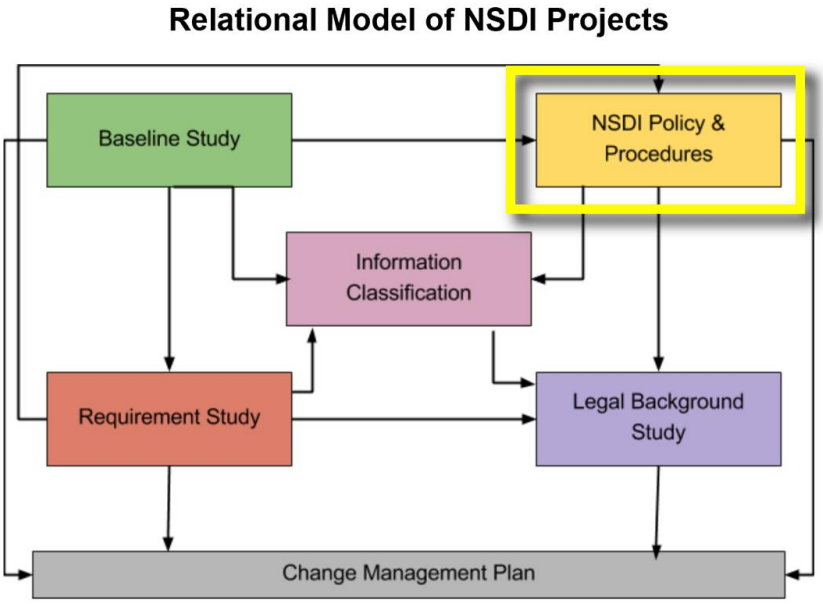


Figure 2 – Relationship Model of SL-NSDI Projects

1.1 Background and Current Situation

With the aims of improving optimum use of spatial data across the government and making effective evidence based decisions, Information and Communication Technology Agency of Sri Lanka (ICTA) is in the process of implementing a Sri Lanka National Spatial Data Infrastructure (SL-NSDI) program, in collaboration with stakeholder institutions. SL-NSDI has been identified as one of the key initiatives identified under the National Digital Policy of the Government of Sri Lanka; "Digitalization of the Economy".

The Government of Sri Lanka has spatial information collected by various government departments. Spatial information technology skills are highly developed in some of the government institutions and the systems used to collect this information are also advanced.

Usage of spatial information across government institutions in a collaborative manner is in significance with respect to the service provisioning and decision making process. Further, spatial information is not able to be easily shared between organizations at the present time, nor is it accessible to the broader community.

Spatial data sets are collected by a number of government organizations to support conducting of an organization's business and not with other agencies' needs in mind. These data are managed in closed systems and this has created a multitude of information silos. Currently, data collected by organizations is not accessible. It is difficult to know what information is available and where it is held. This has led to

several organizations collecting the same information because they are unaware that the information already exists.

Organizations across the government sector recognize that current processes are inefficient and that more cooperation across the sector is required. However, existing data sharing policies are restricting collaboration. There is a significant paper trail of agreements that need to be processed before data sets can be transferred from one organization to another. Manual data sharing procedures contribute to delay in sharing, and the effort required to manually integrate updates from one agency to another is labour intensive and time consuming. The NSL-NSDI program has been conceived to address these issues and facilitate a process of standardizing and streamlining the development and sharing of geospatial data across government and other sectors of Sri Lanka society.

The Governance Structure and Processes defined in this document are aligned with the proposed SL-NSDI Policy that is defined in the "Policy, Governance and Standards Study – Volume 1 of 3 – Policy Framework" document.

1.2 Major Components of the Study Work Program

Accomplishing the general and specific goals and objectives for this activity requires a comprehensive and systematic approach. A work program for addressing the development of the SL-NSDI Policy, Governance and Standards component was previously defined, comprising three interdependent implementation tracks intended to address the scope as defined in the EOI. These tracks are designed to build on the results of the Baseline Study and Requirements Assessment efforts and have been documented in three volumes, as follows:

Volume 1 – SL-NSDI Policy Framework
Volume 2 – SL-NSDI Governance Model and Processes
Volume 3 – SL-NSDI Standards Framework

The tracks were carried out as parallel activities, with incorporation of as-needed interdependencies and coordination among them and with parallel related activities being carried out by others, as illustrated previously in Figure 1. The current report addresses **Volume 2 – SL-NSDI Governance Model and Processes**.

2 SL-NSDI GOVERNANCE AND REPRESENTATION

This section outlines the conceptual governance structure for the SL-NSDI Programme and the various stakeholder representation bodies that will be responsible for shaping and directing the Programme. This structure is defined in alignment with the SL-NSDI Policy statements that are presented under separate cover.

This section is followed by others that describe the structure and operations of the GeoCentre, an office that will provide secretariat support to the SL-NSDI Executive Committee and will be responsible for the day-to-day facilitation, promotion and support of the SL-NSDI initiative.

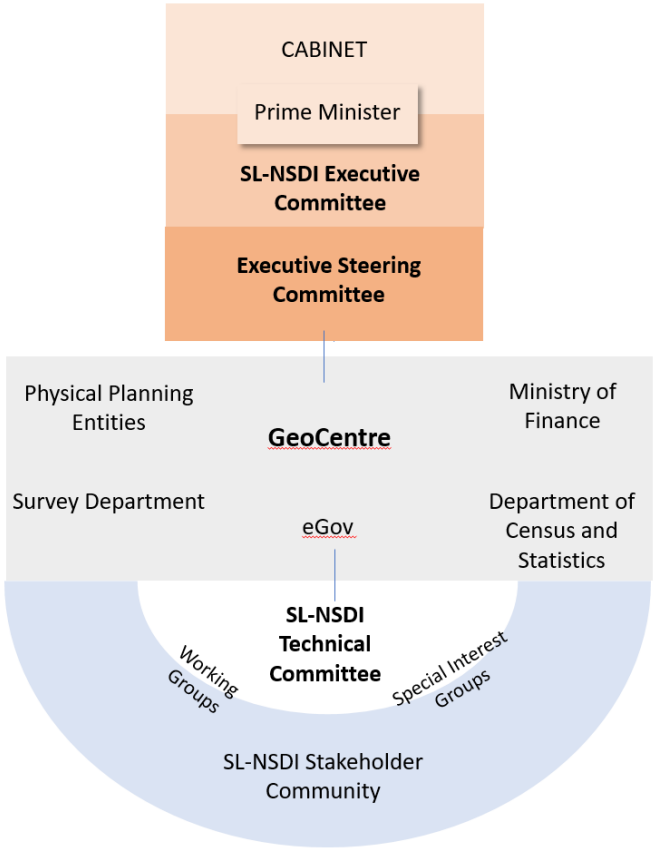
2.1 Conceptual Governance Structure

Per the proposed Policy Framework, the SL-NSDI Programme is to be governed by an Executive Committee chaired by the Prime Minister and comprising members of the Cabinet. The day to day operations, coordination and support of the SL-NSDI is to be carried out by a SL-NSDI GeoCentre that will serve as the secretariat to, supporting and under the direction of, the Executive Committee. Beyond data sharing, the SL-NSDI is being structured to very directly support effective national sustainable development, investment, streamlined and transparent government operations, and the strengthening of capacity and innovation across institutions of higher learning, civil society and the private sector. As such, the SL-NSDI is to be developed and operated in such a manner to provide a "Smart Development Infrastructure (SL-NSDI+)" directly supporting the development and advancement of the Country. The GeoCentre will play an important role in facilitating coordination and data sharing across the stakeholder community, but also have an important role to support the analysis and alignment of sustainable development planning and investment across government.

A Technical Committee comprising representatives from all the key participating organizations will provide will serve in an advisory capacity to address and provide the Executive Committee and GeoCentre advice concerning specific issues that are of interest across the stakeholder community. This function will be further supported through the formation and activities of Working Groups and Special Interest Groups that will be activated to focus on particular specific subjects identified by the Technical Committee.

The conceptual governance structure for the SL-NSDI is represented in the diagram below.

Figure 3 - Conceptual Governance Structure for SL-NSDI



Executive Authority

- Cabinet has ultimate authority and decision making powers
- Prime Minister Chair of Executive Committee
- Executive Committee comprising Ministers
- Executive Steering Committee comprising Directors of member agencies

Central Coordination

- Coordination Office acts as secretariat to the Executive Committee
- Direct coordination and alignment among key government offices governing planning, information, investment and government digital transformation

Community Representation

- Technical Committee comprising representation from all key stakeholders
- Ideally includes representation from non-government sectors (institutions, private sector, civil society)

The sections following provide an elaboration of the specific roles and responsibilities of each of the major functional groups involved in the SL-NSDI. These are based on the functions described in the draft policy which are further elaborated to provide a more complete picture of the specific activities to be carried out by each group.

2.2 SL-NSDI Executive Committee

The SL-NSDI Executive Committee is the executive body with responsibility to provide guidance and direction to the Programme on behalf of the whole of government. The Executive Committee will have ultimate decision-making authority over the priorities, policies and activities of the SL-NSDI, within the mandate and jurisdiction of the Programme. This Committee will include Cabinet members from all the participating government entities, and is to be chaired by the Prime Minister.

While the final authority and decision-making power for all matters of a policy or strategic matter will rest with the Executive Committee, it is likewise recognized that there is need for an executive advisory function to support full consideration of executive matters and functions. An Executive Steering Committee (ESC) is therefore recommended to provide this support. The ESC would include the Directors of the participating agencies and would either be established as a new committee or

alternatively this function could be delegated to the existing ICTA Inter-Ministerial Committee.

The specific topics and activities to be carried out by the Executive Steering Committee in support of the Executive Committee include the following:

- Executive Stakeholder Representation and Oversight;
- Represent the interests and executive perspective of participating stakeholder organizations;
- Jointly assess and make recommendations to Cabinet regarding relevant policies and regulations;
- Provide executive championship in support of the SL-NSDI program;
- Overseeing coordination of geospatial investment management;
- Voting on the adoption of SL-NSDI standards and decisions;
- Assign responsibility internally to ensure agency compliance with SL-NSDI standards and responsibilities;
- Assign responsibility internally to ensure agency resources are dedicated to fulfill the responsibilities of effective spatial data collection, production, and stewardship;
- Assign responsibility internally for ensuring the communication of key national geospatial activities within the agency and with the greater SL-NSDI stakeholder community;
- Appointing an agency technical representative and alternate to serve on the Technical Committee of the SL-NSDI;
- Approve dedication of agency representatives' time to lead or serve on working groups;
- Promoting the benefits of coordinating and partnering among government agencies in the development of the SL-NSDI within the member's agency;
- Champion the use, value, and benefits of geospatial information in decision making and in the business of government;
- Support the member's agency IT and/or GIS managers to ensure that the agency leverages its cumulative geospatial information investments to benefit agency-wide business processes and services.

2.3 SL-NSDI Technical Committee

Technical stakeholder representation in the SL-NSDI is to be provided through a Technical Committee. The Technical Committee is to comprise representative members from each of the organizations actively participating in the SL-NSDI, including both government and non-government entities. Members will be responsible for representing the interests and priorities of their respective organizations in a consultative process that will provide input and advice to the GeoCentre for day to day matters. It will also provide recommendations to the Executive Committee for matters that are of a technical policy matter and involve the interests of multiple organizations.

- Support SL-NSDI executive committee members in the formation and analysis of pertinent policy matters for those aspects that are of a technical nature;
- Support the SL-NSDI in identifying and carrying out cross-agency coordination;
- Lead the coordination of technical issues across the SL-NSDI community;
- Work closely with the SL-NSDI to develop and promote common standards and interoperability guidelines, including participation in topic-focused Working Groups when needed;
- Participate in evaluating cross-agency business processes and applications where spatial information is concerned;
- Participate in the development and promotion of common quality assurance and quality control specifications, methods and tools;
- Participate in the development and adoption of framework data standards and specifications;
- Participate in SL-NSDI data clearinghouse development and operations performance monitoring and provide feedback regarding potential improvements to the SL-NSDI executive committee on a regular basis.

2.3.1 Working Groups

The Working Groups are teams comprised of representatives from SL-NSDI member entities who share a common interest in the issue under address. Each Group focuses on issues that pertain to coordination and the standards associated with the topical area or geospatial data theme (FGDS) such as; data collection, maintenance, access, exchange, and applications using those data.

A Working Group may be initiated for several reasons for example; in response to the needs of a newly engaged entity; a new project track, the development of a new application/e-service; or in response to a specific topic of interest brought to light by the Community through a Special Interest Group (SIG).

The Working Groups function from defined objectives and a working Charter; they are intended for cross-sector collaboration for the delivery of agreed outcomes within a specified timeframe.

WG Member Selection. Working Groups are formulated to address specific issue in a specified timeframe. The Working Group members are expected to be; subject-matter specialists, able to easily converse with other entity representatives on all subject related issues; from a level within their organizations where they are able to influence, or deliver operational initiatives; and, are knowledgeable regarding the SL-NSDI Program and it's implementation.

Figure 4 - Working Group Conceptual Structure

WG Responsibilities. The Group responsibilities include, but are not limited to, the following;

- GeoCentre to assign an Account Coordinator who will be responsible to help facilitate the formation and activities of a Working Group.
- Affected entities to assign one or more representatives to participate in a Working Group.
- One Working Group member to be assigned as Group Coordinator.
- Assist in the development and adoption of common standards of content, format, and accuracy for Working Group-specific data for use by stakeholder agencies and to encourage use by other agencies and organizations, to increase its interoperability and enhance its potential for multiple uses.
- Focus on issues that pertain to coordination and standards associated with a geospatial data theme (FGDS) with regard to data collection, access, exchange, and applications using those data or other areas of interest by the community.
- Participation in the development and evaluation of metadata definitions and other standards used by the international community (ie. International Standards Organisation (ISO), Open Geospatial Consortium (OGC), United Nations (UN) U.S. Federal Geospatial Data Committee (FGDC), EU INSPIRE, etc.) and recommendations for their inclusion in the Sri Lanka Metadata Content Standard as appropriate.
- Assist the development and adoption of common standards of content, format and accuracy for Mstakeh use by all SL-NSDI members, encourage standards implementation by non-SL-NSDI organizations and support interoperability to enhance data's potential for re-use.
- Facilitate collection and compilation of information for Working Group-specific data activities.
- Facilitate the economic and efficient application of Working Group-specific data through the sharing of experiences involving applications.

- Participate in the development and evaluation of data definitions and standards used by international organizations and standards bodies, and make recommendations for their inclusion in Working Group-specific data as appropriate. Facilitate the collection and compilation of information for entities activities including training opportunities supported by SL-NSDI members and other supporters of the SL-NSDI .

WG Coordination. Each Working Group shall be chaired by an individual approved by the Group, and agreed by the SL-NSDI Executive and/or Technical Committees or GeoCentre as appropriate.

Where multiple representatives volunteer for the Group Lead (Chair) position, or for instances where there is no volunteer, GeoCentre management will make an assignment, either from the member entities or from the GeoCentre staff.

Meetings shall be held at the call of the Group Lead. Where a Working Group has a defined timeframe, a calendar of meetings may be pre-determined; the Group Lead reserves the right to call for a special session of the Working Group at any time.

All decisions shall be on the basis of consensus agreement. Where an agreement is not reached, the issue will be promptly referred to the GeoCentre for resolution in consultation with the Technical Committee as necessary.

The Group Lead shall consult with GeoCentre to determine the need for further coordination prior to implementing Group decisions that impact any other Groups.

The Group will employ those tools that are best suited to meeting its responsibilities, such as Group meetings, nation-wide user forums, user surveys and analyses, workshops, and research initiatives, or the initiation of a sub-Working Group for focus on a particular outcome/output.

Follow-up Mechanism. The Group Lead will give notification and an agenda will be distributed to Group members and the GeoCentre Group Coordinator 10 working days in advance of the meeting.

The Group Lead is responsible for organizing the provision of a draft report of Group meetings (Minutes of Meeting - MoM), including recommendations and action items, to all Group members and GeoCentre Group Coordinator for review prior to approval.

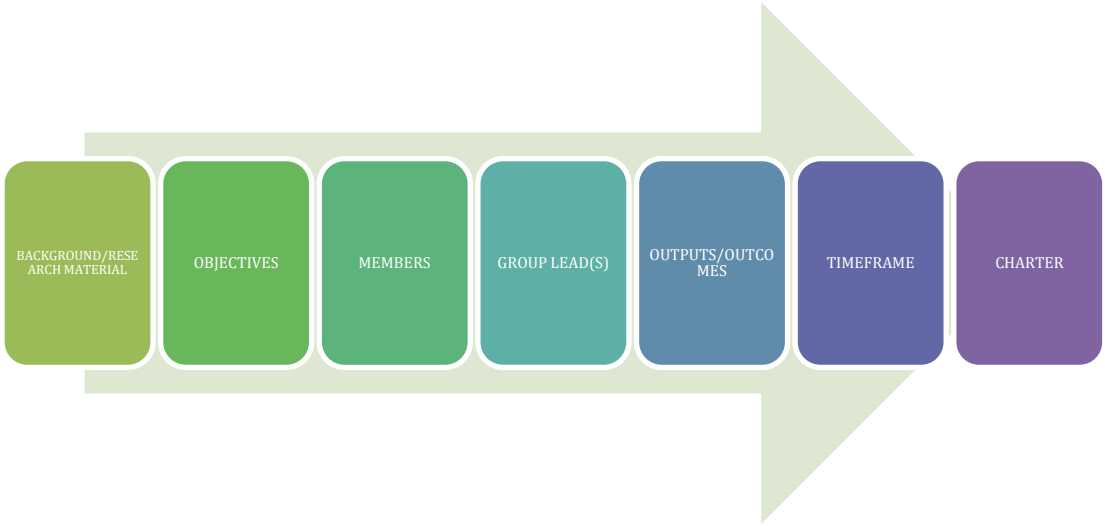
On approval, the Group Lead shall provide the final report of Group meetings to all members, GeoCentre Group Coordinator and GeoCentre Management.

The SL-NSDI Group Coordinators may take responsibility for the Group administration tasks at the request of the Group, and subject to approval by GeoCentre management.

Sub-Working Groups. The sub-Working Group is formed from selected members of the Group to focus on a particular topic/issue/deliverable defined by the Working Group. The sub-Working Group will have a limited timeframe for completion and provide regular reports to the Group on its progress.

Once the outcomes/outputs have been achieved, the sub-Working Group will be dissolved. Another sub-Working Group can be initiated by the Working Group at any time.

WG Documents. Each Group functions under a Charter; this is the Group's mandate which outlines its scope or purpose, the members and Group Lead, and its guidelines or objectives. The Working Group Charters are also required to define each Group's intended outputs and outcomes, as well as a timeframe and roadmap for delivery. The accompanying diagram illustrates the elements which combine to produce the Group



Charter.

The Charter is a "living" document which is maintained throughout the lifecycle of the Group to reflect its current status. It is updated on, for example; a change in scope or re-definition of Group objectives; on the joining of a new entity or change in entity representative; change in defined outcomes or timeframe.

Each Working Group is also required to submit an Implementation Plan/Roadmap for achieving the agreed outputs/outcomes, and an operations plan which outlines the plan for each new operating period for GeoCentre review and concurrence. An operating plan should be submitted for every new operating period (e.g. annually) for the life cycle of the Working Group.

On delivery of the outputs, each Working Group should also produce a Final Report. This is a final document which documents the Groups' achievements, challenges and any other issues faced during its life cycle.

GeoCentre Responsibilities Relative To Working Groups. The team's responsibilities include, but are not limited to, the following:

- Facilitating the initiation of a new Working Groups, including the preparation of the framework papers, i.e., the Charter.
- Identifying the Group members, in collaboration with the Entity Account Manager and Entity SL-NSDI Representatives.
- Coordination of the initial meeting, and assistance for any meetings of special junctures, e.g. workshops, etc.

- Promoting consensus with the participants on the Group's Charter, Action Plan, and Group Lead.
- Monitoring and reporting on Group performance.
- Report on any difficulties or risks to GeoCentre management
- Review requirement for sub-Working Group, and facilitate initiation.
- Follow up on all actions items with, or in coordination with the Group Lead(s).
- Communicating the update status of projects discussed in the WG and 'Standards development' in relation to the Project / Class / Theme/ Topic to the Data Projects team (*refer to the Data Projects SOP for more details*)
- Transfer of any the gathered (formal / informal means) intelligence and knowledge on all projects that may have spatial components or relate to ICT/e-gov initiatives for assessment by the Data Projects team.

2.3.2 Special Interest Groups

Are permanent sub-bodies of the SL-NSDI Community; they serve as a forum for cross disciplinary, sector-orientated collaboration on those aspects of SL-NSDI and related matters that are most relevant within their community of practice.

Special Interest Groups (SIG) consist of representatives from SL-NSDI member entities and subject-matter experts around geospatial data themes or persistent topical areas such as, Public Safety and Security and the Environment. The Group is a forum for discussion and action on the strategic issues related to the implementation of the SL-NSDI initiative, for example; policy recommendations, use of standards and specifications and roll out, business guidelines, and issues pertaining to privacy and security. At any time, an SIG may request the formulation of a Working Group(s) in order to tackle specific topics of interest from the SIG's scope or topical area.

It is considered that the purpose of the SIGs will continue and develop, providing a 'think-tank' for all governance related issues; expanding in representation to all government and key external agencies, committed to the continued development of the Country.

SIG Member Selection. Special Interest Groups are an association of individuals or organizations formally organized, on the basis of one or more shared concerns, to attempt to influence public policy in its favour. They provide a channel for special expertise to be made available to decision-makers, and for particular concerns to be brought to their attention.

Entities may be represented in one or several Groups. On the initiation of a new Group, the Group Coordinators liaise with the Entity Account Manager and the Entity Representative to select the most suitable representative(s) for the Group(s). The diagram below highlights some of the key criteria for SIG member selection.

Figure 5 - SIG Conceptual Structure

It is expected that SIG members are from a level within their organization where they; influence or delivery policy recommendations; authorize operational strategy initiatives; have an overview of the e-government strategy and understanding of its impact and influence on society.

SIG Responsibilities. The Group responsibilities include, but are not limited to, the following;

- Act as a forum to discuss best practices by Government organisations on a national, regional and municipal level.
- Consider the growing trend, traction and importance of the subject sustainability and its related activities in Sri Lanka.
- Define the different needs by various stakeholders for geospatial data.
- Confer on the best mechanism for collaboration in the future to avoid redundancy while meeting the common needs of the different members in the SL-NSDI Community.
- Establish a forum for sharing information and news.
- Address areas of policy, regulatory, and institutional practice that will have an impact on the SL-NSDI .
- Facilitate access to resources such as, the web-based Geoportal.
- Identify areas that can be instigated and facilitated by the SIG members.
- Propose the development of tools and methods to stay up-to-date on entity related projects and/or activities (for example, the development and maintenance of a dedicated channel on the SL-NSDI Portal).
- Contribute toward the development and execution of key events outreach and communication.
- Facilitate the development and coordination of agency activities.
- Promote the publication of digital spatial data.
- Assist GeoCentre to establish and publish standards, specifications and strategic priorities.

- Promote entity responsibility in complying with SL-NSDI standards and thus institutionalizing SL-NSDI standards, in consensus with the entities and help cross-agency coordination in data sharing and information exchange.
- Promote nation-wide use of defined and published spatial data transfer standards.
- Support development of the Sri Lanka Spatial Data Infrastructure through facilitation of partnerships and definition of data framework standards.
- Identify ways in which data from any source may be included in the Sri Lanka Spatial Data Infrastructure.

SIG Coordination. Each Group shall be chaired by an individual approved by the Group, and agreed by the SL-NSDI Executive and/or Stakeholder Group or GeoCentre as appropriate.

Where multiple representatives volunteer for the Group Lead (Chair) position, or for instances where there is no volunteer, GeoCentre management will make an assignment, either from the member entities or from the GeoCentre staff.

Meetings shall be held at the call of the Group Lead.

All decisions shall be on the basis of consensus agreement. Where an agreement is not reached, the issue will be promptly referred to the GeoCentre for resolution.

The Group Lead will coordinate the Group's activities with other SL-NSDI Groups by participating in SL-NSDI meetings.

The Group will employ those tools that are best suited to meeting its responsibilities, such as Group meetings, nation-wide user forums, user surveys and analyses, workshops, and research initiatives.

Follow-up Mechanism. Normally, the Group Lead will give notification and an agenda will be distributed to Group members and the Group Coordinator, 10 working days in advance of the meeting.

The Group Lead is responsible for organizing the provision of a draft report of Group meetings (MoMs), including recommendations and action items, to all Group members and SL-NSDI Group Coordinator for review prior to approval.

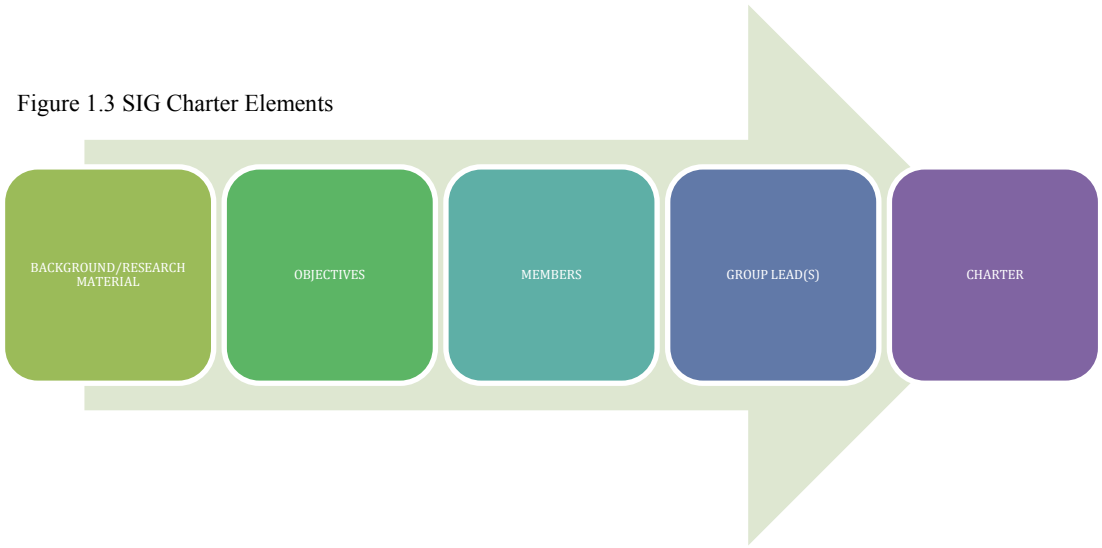
On approval, the Group Lead shall provide the final report of Group meetings to all members, Groups Coordinators, GeoCentre management, if required, the SL-NSDI Technical Committee.

The SL-NSDI Group Coordinators may take responsibility for the Group administration tasks at the request of the Group, and subject to approval by GeoCentre management.

SIG Documents. Each Community Organization Group is initiated for a specific purpose. A Special Interest Groups general purpose is, for continued cross-sector collaboration to influence policy and provide guidance for decision-makers on a spatially related topic

Each Group is required to produce a Charter; this is the Group's mandate which outlines its scope or purpose, the members and Group Lead, and its operational guidelines or objectives. The Charter is a "living" which is updated throughout the lifecycle of the Group.

Figure 1.3 SIG Charter Elements



GeoCentre Team Responsibilities. The Group Coordinator's responsibilities include, but are not limited to, the following:

- Facilitating the initiation of a new Special Interest Groups, including the preparation of the framework papers, i.e., the Charter.
- Identifying the Group members in collaboration with the GeoCentre Entity Account Manager and Entity SL-NSDI Representatives.
- Setting the agenda for, and organising the initial meeting, and assistance for any meetings of special junctures, e.g. workshops, etc.
- Promoting consensus with the participants on the Group's Charter and Group Lead.
- Monitoring and reporting on Group performance.
- Follow up on all actions items with, or in coordination with the Group Lead(s).
- Review the requirement for new Working Group, and facilitate initiation process.
- Communicating the status of 'Standards development' in relation to the Project / Class / Theme/ Topic to the DP team to monitor the progress of standards development related to each project.
- Transfer of any the gathered (formal / informal means) intelligence and knowledge on all projects that may have spatial components or relate to ICT/e-gov initiatives for assessment by the Data Projects team.

3 GEOCENTRE ORGANIZATION AND STAFFING

The GeoCentre operations are to be supported through a lean functional organizational structure that is described below. The GeoCentre function acting under the direction of the SL-NSDI Executive Committee will be established to support the effort through both initiation and operation stages of SL-NSDI development. The purpose of the

GeoCentre is to facilitate, promote, coordinate and support the SL-NSDI initiative on a permanent basis, and to provide geographic analysis and decision support to the executive leadership when required. This section outlines the form and staffing of the GeoCentre, with operations described in a section following.

3.1 Structure

The GeoCentre as envisioned would include specialized staff and physical infrastructure needed to promote, coordinate, facilitate, and support the spatial component of the SL-NSDI. This office would report directly to the SL-NSDI Executive Committee and act at its direction. General functions of the GeoCentre within the context of the broader SL-NSDI initiative are summarized below (additional operational details are provided in the next Section of this report):

- Work with Technical Committee to assess and develop SL-NSDI policy for consideration and final decision making by the Executive Committee;
- Develop common standards and guidelines in consultation with the Technical Committee;
- Assist Executive and Technical committees in cross-agency coordination, business process reconciliation, and related matters;
- Provide the Sri Lanka leadership with "honest broker" decision-support analysis of various financial, technical, and other issues;
- Promote and develop strategic public/private/institutional partnerships;
- Develop, manage and operate main spatial data clearinghouse node;
- Coordinate data security and setting of data publisher and user rights, in collaboration with the Executive Committee, and other government authorities as dictated in policy and law;
- Promote and support the development of value-add services by the private and institutional sectors;
- Promote and support, in collaboration with ICTA, the expansion of spatial components of online e-Government services;
- Promote adoption and enforcement of quality assurance and quality control measures in all application service development and framework spatial data acquisition efforts;
- Participate in the development and adoption of common framework data standards, in partnership with custodian agencies and in consultation with stakeholder agencies;
- Monitor framework data acquisition projects and maintenance activities, including the maintenance of metadata by custodian agencies;
- Participate in framework data configuration management, in partnership with custodian agencies and in consultation with affected stakeholders;
- Administer acquisition and licensing of data for which there is no other logical custodian;

- Provide general oversight for FGDS data development and maintenance in the SL-NSDI Community;
- Develop and implement GeoCentre staff training and professional development;
- Promote and support common training program needs throughout the stakeholder community;
- Provide helpdesk support services to the SL-NSDI Community in regards to SL-NSDI matters;
- Develop and maintain a GIS Library;
- Operate a service bureau function in order to support the SL-NSDI Community in the provision of SL-NSDI related services;
- Provide periodical reporting and monitoring to the Executive Committee and ensure that the SL-NSDI member agencies and working groups report the same based on the set forth service level agreements;
- Develop and maintain SL-NSDI program performance monitoring and management;
- Develop and coordinate Program business development with the Executive Committee.
- Formalize, institutionalize, and extend SL-NSDI activities among existing stakeholders (SL-NSDI community)
- Expand the SL-NSDI community
- Increase awareness among interested groups (academia, private sector, public) via media;
- Extend and increase appreciation for SL-NSDI value among policy makers;
- Collect and package information/data for results reporting and media placement

The basic conceptual structure and major functions of the GeoCentre is illustrated in Figure 6. Figure 7 illustrates the connectivity between the GeoCentre and the SL-NSDI stakeholders.

Figure 6 – *SL-NSDI GeoCentre Major Functions*

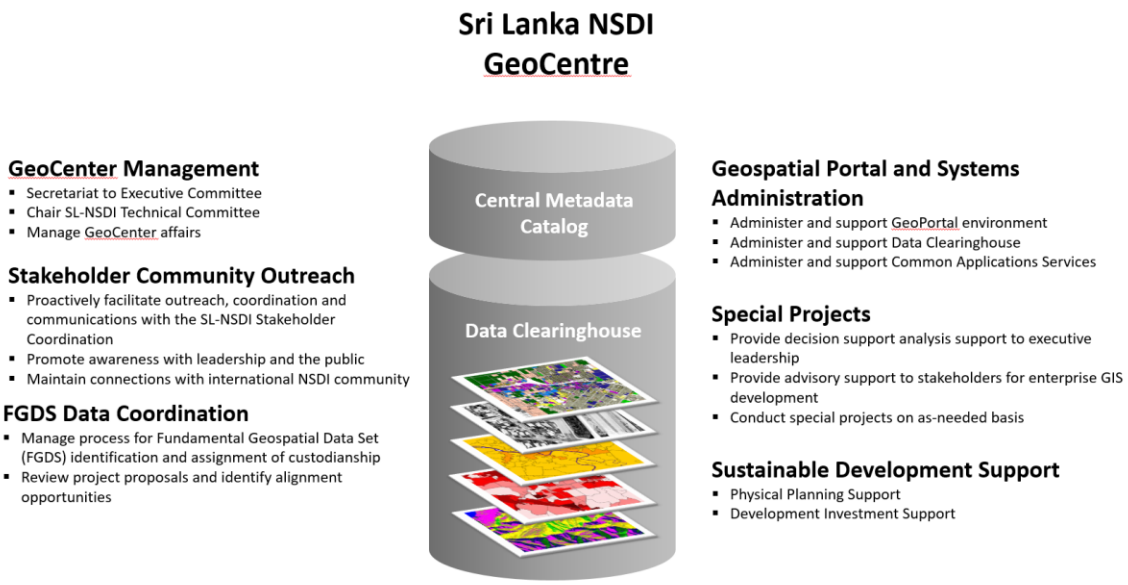
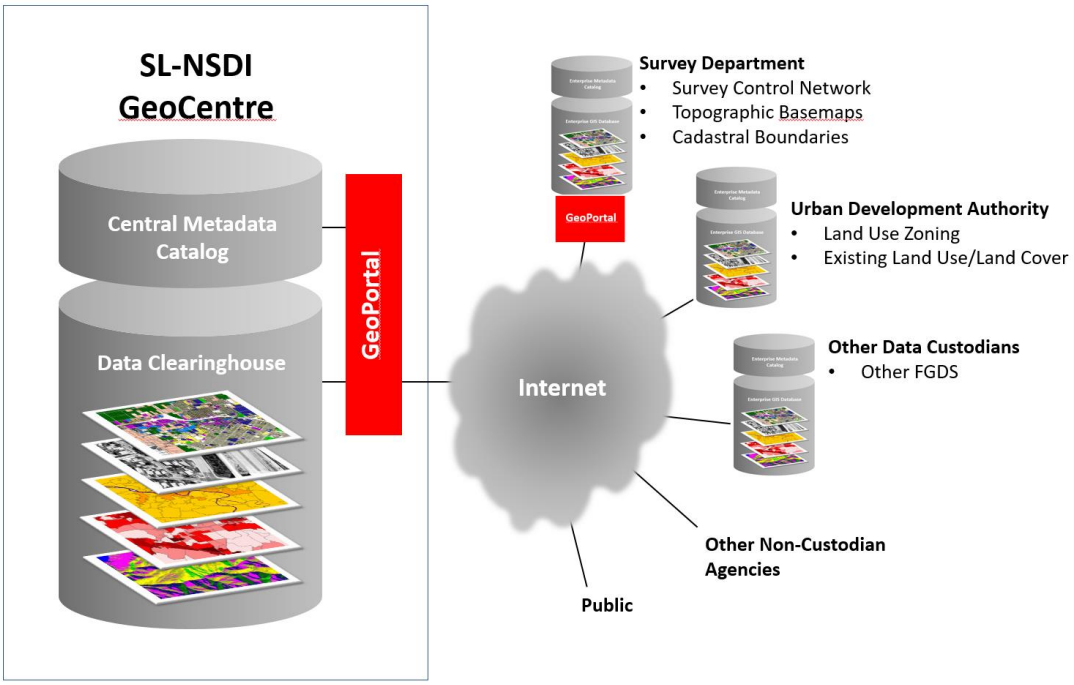
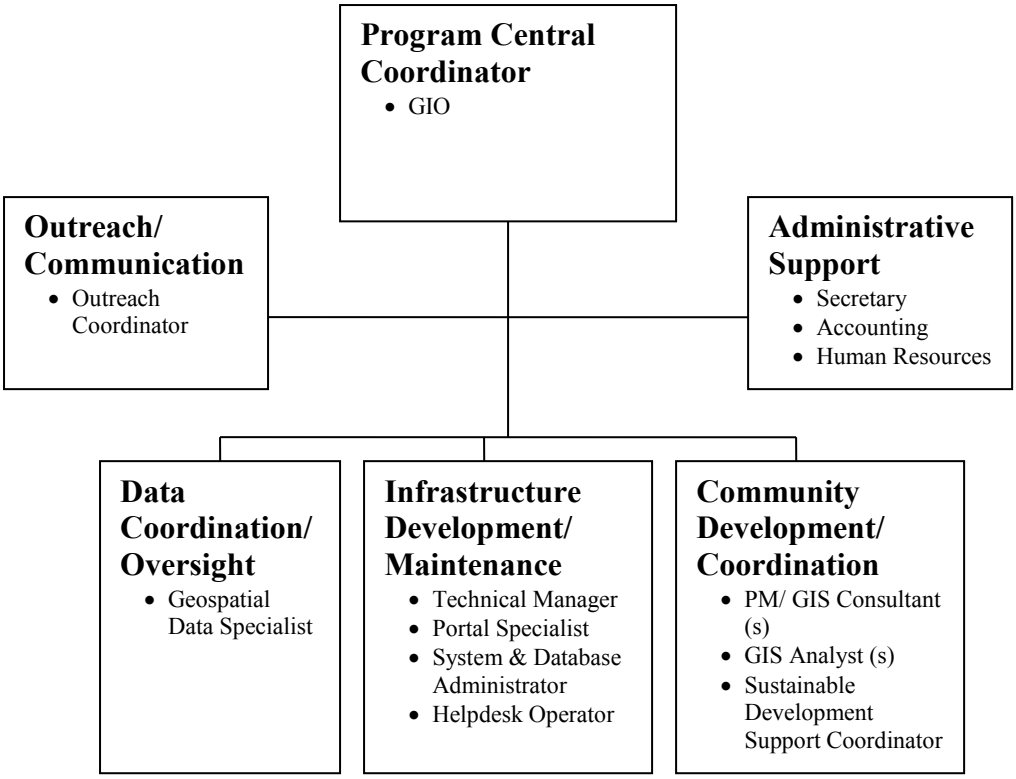


Figure 7 – ***SL-NSDI Stakeholder Types and Connectivity to GeoCentre Resources***



The functions of the GeoCentre are to be carried out by a number of interdependent teams. The basic configuration of these teams and the staff roles that comprise them are illustrated in Figure 8 below. Each of these staff roles are described in the next sub-section. The full operational range of activities to be carried out by each team are described in the section following.

Figure 8 – ***GeoCentre Functional Organizational Structure***



3.2 Staffing

The GeoCentre will facilitate, coordinate, and support the development of the SL-NSDI, manage and operate a central Geospatial Data Clearinghouse, and provide limited technical services to the government executive leadership and others in the stakeholder community on an as-needed basis. Staffing of the GeoCentre will need to be sufficient to carry out all the primary functions described in the next chapter in an efficient and timely manner.

The following summarizes the primary staff roles that are required:

Geographic Information Officer (GIO). The GIO will be a person with primary responsibility as executive director for overseeing and coordinating the SL-NSDI implementation and ongoing operations of the GeoCentre. This person will also participate in carrying technical tasks within the overall work program, and will be the primary liaison to the Executive Committee and Technical Committee members. The GIO shall be able to mobilize, where needed by the SL-NSDI Community, the necessary resources for the provision of occasional advisory services to support stakeholder organizations in building their own internal enterprise GIS capacity.

Secretary. The GeoCentre will require at least one secretary. The latter will work most closely with the GIO, but will also provide general logistical and secretarial support throughout the office.

Outreach Coordinator. This person will coordinate with others on the SL-NSDI GeoCentre team and Technical Committee to identify key opportunities for publicizing, both nationally and internationally, the progress and development of the SL-NSDI Program and its resulting outputs to the SL-NSDI geospatial portal. In addition, the Outreach Coordinator will work with the Technical Committee to prioritize the development of those products that will showcase the SL-NSDI initiative and leverage external relationships and publicity. The Outreach Coordinator will oversee the development of a training and capacity building program for the GeoCentre and coordinate the development of normalized training activities in the SL-NSDI Community.

PM/ GIS Consultant. The PM/ GIS Consultant will report to the GIO. This role acts in the position of a generalist consultant with a wide experience in a multi-sector environment. He/She has strong planning and analytical skills, business and management experience and well-rounded GIS background and experience and can support any activities that may fall under the Community development and coordination function. The PM/GIS Consultant may be assigned by the GIO the management of special projects or specific oversight responsibilities within the SL-NSDI Program development, including coordinating the GeoCenter sustainable development planning support functions with the appropriate stakeholders.

Technical Manager. The Technical Manager will be a person who has technical expertise in all aspects of geospatial analysis including GIS, remote sensing, spatial analysis, programming and cartographic production. This person will report to the GIO and be responsible for coordinating among the GIS analysts to delegate and assess progress on management of Clearinghouse data, refinement of Portal interface enhancements, and other issues. This person will also be responsible for the technical management of GeoCentre projects and operations, technical resource allocations and technical staff assignments to projects and activities. It will also include oversight of the content aspects of the SL-NSDI Geospatial Portal and associated metadata, data and application services, as well as the development and management of any associated application services;

Geospatial Data Specialist. The Geospatial Data Specialist position will be responsible for the oversight and facilitation of all issues relating to the establishment and operation of all fundamental geospatial data sets (FGDS). This includes participation in all FGDS Working Groups, data content standard development, data modeling, establishment of related service level agreements

(SLA's), and follow-up to ensure that terms and conditions of all FGDS SLA's are complied with on an ongoing basis;

Systems and Database Administrator. The System Administrator will work under the general direction of the Technical Manager and will be responsible to ensure that the computing infrastructure and geospatial databases and applications are kept in running condition and administered in a systematic and effective manner;

Geospatial Portal Specialist. The Geospatial Portal Specialist is responsible for the detailed design, development and maintenance of the SL-NSDI Geospatial Portal. The Geospatial Portal shall ensure the development and operation are compatible with international good practice and the IT standards adopted by ICTA that is hosting the portal services on the Lanka Government Cloud computing environment;

GIS Analyst. A number of analysts will be required initially to provide basic technical and analytical support to the participating stakeholder agencies, some of whom could be hired earlier during SL-NSDI foundation development in order to ensure production of foundation strategy products and applications. These staff will also work under the general direction of the Technical Manager. Analysts may have specialization in particular areas of system and database design, spatial analytical procedures, cartographic design and programming. In addition, the Analysts should have the capability to produce high-quality applications and outputs necessary to demonstrate the effectiveness of the SL-NSDI program and meet the objectives of the participating stakeholder agencies. The number of analysts may be increased later depending on the level of demand for such support from the leadership and user community;

Sustainable Development Support Coordinator. A key function of the GeoCentre in line with the concept of "Smart Development Infrastructure (SDI+) will be to directly coordinate with and support all the physical planning and development investment activities going on within the Country. A Sustainable Development Support Coordinator will liase with the specific stakeholder entities that are involved in these activities to ensure that the SL-NSDI resources are aligned and utilized in the most effective manner to support integrated sustainable development and investment;

Help Desk Operator. At least one permanent staff should be allocated to operate and maintain a help desk function for the SL-NSDI. Initially, this role may be filled by the senior administrative assistant, but it is expected that the level of traffic in this area will increase significantly as more organizations start to utilize the SL-NSDI infrastructure on a more regular basis. Eventually, it is expected that this will be a full-time occupation to receive, log, analyze and respond to

requests for information or support, or to route such requests to the appropriate person or entity.

4 GEOCENTRE OPERATIONS

The GeoCentre will be responsible for carrying out a variety of activities that will be necessary for the SL-NSDI programme and infrastructure to perform effectively. The major operational areas to be addressed include the following and as described in more detail in the sub-sections following.

- Program Central Coordination
- Community Development and Support
- FGDS Data Development
- Infrastructure Development and Operations
- Special Projects and Decision Support

4.1 Program Central Coordination

The SL-NSDI GeoCentre will act to facilitate, coordinate, and support the development of the SL-NSDI, manage and operate a central Geospatial Data Clearinghouse, and provide limited technical services to the stakeholder community on an as-needed basis. Primary functions related to the overall coordination of the Programme include the following:

- Provide overall oversight and coordination of the SL-NSDI implementation plan;
- Oversee and interact with major FGDS data development projects to ensure compliance with SL-NSDI principles and community interests;
- Support executive representation functions;
- Chair technical representation, participate and support regular meetings and other functions;
- Maintain SL-NSDI Portal with information about the SL-NSDI initiative;
- Maintain Geospatial Portal and associated services;
- Manage and operate a central geospatial data clearinghouse. Data stored in this clearinghouse will primarily include those FGDS that are needed in common across the community, but whose custodian agency is not yet prepared to host and provide that information from their own distributed SL-NSDI node;
- Manage and operate an SL-NSDI "help desk" to receive, log and route requests for information and support to the appropriate place;
- Oversee topically focused coordination and joint development functions, and participate directly in Working Group activities where relevant;
- Prepare policies and policy refinements for recommendation to the Executive representation;

- Provide special technical support to SL-NSDI community. A limited technical consulting and support capability will be maintained to allow the SL-NSDI program central coordination and facilitation entity to assist other organizations on an as-needed basis;
- Administer and manage the SL-NSDI program central coordination and facilitation facility and staff.

The GIO will be responsible for coordinating the overall management of the SL-NSDI Programme, with support from other senior GeoCentre staff.

4.1.1 GeoCentre General Administration

Like with any unit of government, there are certain general and administrative activities that are required to ensure the operation can run smoothly. The General Administration and Program Management support for the GeoCentre consists of the following:

- General administrative support (secretarial;
- Accounting
- Staff recruitment
- Training and Capacity Building
- General Administration

Staff Recruitment. The draft job descriptions for each of the positions that have been identified for the GeoCentre are described in Annex C. These positions will be filled as qualified candidates are recruited. As with any recruitment program, the job descriptions may need to be adjusted during the hiring process to reflect any shuffling of roles and responsibilities depending upon the skill sets of the high-potential candidates. Position descriptions have been structured in a form suitable to support the recruitment process. The following positions are included:

1. Geographic Information Officer (GIO)
2. Secretary
3. Outreach Coordinator
4. PM/GIS Consultant
5. Sustainable Development Support Coordinator
6. Technical Manager
7. Geospatial Data Specialist
8. Systems and Database Administrator
9. Geospatial Portal Specialist
10. GIS Analyst
11. Help Desk Operator

In addition, Annex D contains reference information related to hiring and retention of employees in a SL-NSDI development environment.

Training & Capacity Building. The training & capacity building activity will establish a framework for coordinated capacity building of the SL-NSDI community and will develop and implement training programs for the GeoCentre staff as described in Annex E. In addition, Annex F contains staff self-evaluation forms for additional reference.

GeoCentre Facility Development. The GeoCentre will have high visibility and interaction with various levels of the Sri Lanka government, private sector and international organizations. Therefore, the GeoCentre should be established such that it showcases the SL-NSDI initiative in an appealing manner to all visitors and provides a dynamic working space for GeoCentre staff, one that is evident to incoming visitors. Similarly, the functionality of the GeoCentre should be established such that staff can adequately perform the work required in a creative, collaborative and inspiring environment, while also being able to interact effectively with others visiting from external organizations or within the greater SL-NSDI community.

Establishment of the GeoCentre will require a permanent facility to house the group, and a variety of equipment, furniture and supporting infrastructure (computing infrastructure addressed elsewhere). This will need to be re-assessed and finalized during the final design and implementation of the initial GeoCentre. This activity addresses the steps that will be required to plan, design and implement the GeoCentre facility and associated infrastructure as described in Annex G, outside of the computing infrastructure which is addressed elsewhere.

Strategic Plan Update. The SL-NSDI Strategic Plan shall be updated towards the end of the first implementation phase of the SL-NSDI Program. The update will reflect a synthesis of community development requirements, community coordination and support requirements as well as SL-NSDI operational requirements of the SL-NSDI Geospatial portal. The updated strategic plan will set the direction for the next implementation stage.

General Administration. The General Administration activity consists of the following that are described in Annex H:

- General administrative support
- Financial Management Support
- Supplies/ General Services
- Monitoring & Reporting
- Office Administration

4.1.2 SL-NSDI Policy and Regulatory Oversight

The GeoCentre shall support the development and formulation of the policy and regulatory environment that support the SL-NSDI Program development. In order to do

so, it shall allocate the necessary resources in order to support the adoption and management of the proposed SL-NSDI policy and legal frameworks as described under separate cover.

4.1.3 Communications and Outreach

The GeoCentre shall be equipped to support the following outreach and communication activities:

- Maintain website content
- Oversee website development i.e. structure and content
- Promote and process new SL-NSDI membership
- Administer SL-NSDI newsletter
- Administer media outreach, promotion and communications
- Participate in the expansion of the SL-NSDI community
- Increase awareness among interested groups (academia, private sector, public) via media
- Extend and increase appreciation for SL-NSDI value among policy makers
- Collect and package information/data for results reporting and media placement

4.1.4 Community Development, Coordination & Support

The Community Development & Coordination Support function shall consist of the following:

- Community Development
- Community Coordination and Support
- Adhoc Support and Special Projects

4.1.5 Community Development

The SL-NSDI Community Development is a continuous activity that will evolve over time. During the inception phase of the SL-NSDI Programme a broad community of potential stakeholder organizations were engaged in conducting a Baseline Study and Requirements Analysis to understand the situation and needs across the community. The number of organizations that will be ready and able to actively participate in the initial implementation of the Programme will be necessarily more limited based on several variables including their FGDS data custodianship role, their stewardship role as users and beneficiaries of the program, their status and readiness for building their enterprise capacity and the role of GIS in spatially enabling their core businesses. The process of substantive engagement with additional entities beyond the first phase is expected to continue during program implementation in what can be entitled as a second wave of community development. The latter will consist of new users' assessment, new stakeholders' surveys, new requirements additions and integration in the program

implementation and coordination strategy. The main components of this activity are the following:

Stakeholder Survey. A stakeholder survey will be conducted for the new agencies that join the SL-NSDI community.

Data Inventory & Assessment. A detailed data inventory & assessment will be implemented in order to identify the data sources maintained by each new organization that have a potential of becoming reference data for the SL-NSDI community in the future.

Requirements Analysis. The GeoCentre will assess the SL-NSDI requirements based on the valuable information that was obtained from the stakeholder survey, and data inventory and assessment.

Implementation Strategy. Based on the outcome of the requirements analysis and the possible outcome scenarios, an implementation strategy shall be developed which may consist of several activities to fully engage new organizations with the SL-NSDI programme.

4.1.6 Community Coordination & Support

Once the SL-NSDI GeoPortal is operational and agencies start using it, then the community will eventually move to the next stage of coordination. To do so, it will require the support of the GeoCentre that will dispatch the necessary resources in order identify the common community developments and translate them into SL-NSDI development requirements.

In parallel, the GeoCentre will be required to ensure coordination among sector and agency projects that may ensue. Some of the requirements may involve, for example, strengthening of the communication infrastructure to meet the growing needs of the SL-NSDI community. Some may necessitate the scoping and coordination of community applications that serve the community across the board. In some cases, the developments may be focused to common applications that may serve the needs of few agencies or sectors such as the development of a common document and multi-media management system. In other cases, specialized applications may be developed in order to cater for domain-specific needs of sectors and/or agencies such as utility and project coordination or planning support. The scope of this activity will be limited to the preparation and scoping of similar requirements as outlined above when they arise and to the supervision of implementation as a way of support provisioning for programs and/ or projects. The activity main components are the following:

SL-NSDI community coordination framework. The GeoCentre has, according to its mandate, an oversight role on the implementation initiatives that are executed by the member agencies and that may have an impact on the SL-NSDI community. In addition to its oversight function, the GeoCentre shall be requested

by the community to coordinate the development of implementation projects that have a cross-agency impact. This activity component shall ensure that a coordination framework is introduced that is governed by standard operating procedures and is integrated with the GeoCentre routine configuration management. Also, it shall ensure the allocation of the necessary resources in order to support the coordination activity including the development of initial design specification and the packaging of technical specifications for tendering solicitation.

SL-NSDI community support framework. The GeoCentre shall provide specific support to the member agencies in the execution of the common community coordination projects. The support framework may include program management support such as project management organization structure and review of major project components.

Where the situation arises, certain activities may need to be managed in the context of projects with defined mandate and properly allocated resources and time frame. In this case, the GeoCentre participation may be direct or indirect as described below:

SL-NSDI Projects Development. The SL-NSDI projects development are projects that are initiated and managed by the SL-NSDI Community with coordination and support participation by the GeoCentre. The project (s) may be managed under the leadership of one of the special interest working groups or by an agency representative. For more details on SL-NSDI Projects Development, please refer to Annex I.

GeoCentre Projects Management. In certain cases, certain projects may be managed directly by the GeoCentre based on the request and/or needs of the SL-NSDI Community. This activity describes how the projects are internally managed within the GeoCentre and coordinated with the SL-NSDI stakeholders as necessary. For more details on SL-NSDI Projects Development, please refer to Annex I.

4.1.7 Adhoc Support & Special Projects

It can be expected as part of the GeoCentre operations that the ad hoc technical support for information and special project requests may be required by management and VIPs that are not considered in the rest of the program described above. Past experience suggests that it is better to plan for accommodating some level of ad hoc activities rather than pull production staff from their planned activities. This will both reduce the impacts to planned activities as well as ensure that the GeoCentre is prepared to effectively and immediately support requests from VIP's and others that are likely to

arise during the system implementation process. This activity would involve establishing a small team of analysts who in addition to supporting other parts of GeoCentre operations will also be allocated a certain amount of time to support the inevitable special requests and special projects that will arise on an ad hoc basis.

4.2 FGDS Data Development & Coordination

FGDS data development, coordination and oversight activity includes the following:

- Service Level Management including Master Service Level Agreements (MSLAs)
- FGDS Data Identification and Development
- Major Data Projects Alignment Coordination
- Data Standards Development

4.2.1 Service Level Management

Several Level Management (SLM) may be based on international standards and best practices such as ITIL which has achieved recognition worldwide. SLM forms the basis for Service Level Agreements (SLAs) and ensures quality services for the organization. To be effective, a service level agreement must incorporate two sets of elements: service elements and management elements.

Service elements: The service elements clarify services by communicating such things as:

- The services provided (and perhaps certain services not provided, if customers might reasonably assume the availability of such services)
- Conditions of service availability
- Service standards, such as the timeframes within which services will be provided
- The responsibilities of both parties
- Cost vs. service tradeoffs
- Escalation procedures

Management elements: The management elements focus on such things as:

- How service effectiveness will be tracked
- How information about service effectiveness will be reported and addressed
- How service-related disagreements will be resolved
- How the parties will review and revise the agreement

The process of planning, establishing, and implementing an agreement is typically a significant process of information-gathering, analyzing, documenting, presenting, educating, negotiating, and consensus-building in direct collaboration with the involved stakeholder organization.

A table of contents for a standard SLA is described in Annex J. It defines, among other things, the scope of work for the standard services and their conditions for availability in addition to support services and responsibilities based on the agreed upon agreement. It includes also measures of performance, tracking and reporting and deals with legal issues pertaining to security, intellectual property and legal compliance.

A SLA that is not managed dies upon implementation. Once an SLA becomes operational, the SLA Manager's responsibilities may include (but not be limited to):

- Serve as the point of contact for problems or concerns related to the SLA itself and the delivery of services described in the SLA;
- Maintain ongoing contact with the other party's SLA Manager;
- Serve as the primary point of contact in the escalation process;
- Coordinate and implement modifications to service delivery and to the SLA itself ;
- Periodically assess the effectiveness of mechanisms selected for service tracking and reporting;
- Plan and coordinate service reviews;
- Facilitate or participate in conflict resolution processes regarding service effectiveness;
- Regularly assess and report on how the two parties can further strengthen their working relationship;
- Delegate responsibilities to, or seek the assistance of, colleagues, subordinates or members of the other party's staff to address issues that may arise under the agreement;
- Plan training designed to foster a heightened service attitude, create an enhanced awareness of the elements of high-quality customer service, and provide skills in service delivery.

A draft Master Service Level Agreement that is proposed by the SL-NSDI project team to be adopted as a reference template while developing the future agreements between the GeoCentre and the SL-NSDI member agencies. The Master Service Level Agreement (MSLA) shall be supplemented by an Addendum SLA that reflects the specific conditions and agreements with the individual custodian or steward government entity. Please refer to Annex J where the MSLA is described for reference.

4.2.2 Data Access & Security Management

Data access, sharing and reuse policy is a live activity that will need to be updated periodically by the GeoCentre in light of the evolution of SL-NSDI program. As part of the foundation phase development of the SL-NSDI Program, the SL-NSDI project team will be responsible to develop a detailed data security classification for each standardized FGDS that will reside in the SL-NSDI Geospatial Portal. Access levels

will be established as referenced in the Policy Framework document and defined in the National Data Sharing Policy (draft) under separate cover. The type of access to be determined based upon a qualitative indicator of data sensitivity that has been developed by ICTA. Where required, a benefit and risk assessment will be developed in order to provide an informed decision about the consequence of disclosing or not the information to a category of users whenever this is in question.

4.2.3 FGDS Data Identification & Development

As described in the SL-NSDI Requirements Study – Requirements Assessment Report, Volume 2 - Data document, the project team has identified the Fundamental Geographic Data Sets (FGDS) that is of common interest and use by the SL-NSDI Community. The data was categorized into class, theme and topic and was characterized by scale and associated with unique custodians for each scale. The GeoCentre shall continue to promote and facilitate the process of FGDS data identification, development and further refinement in the future taking into consideration that new stakeholders and additional fundamental data may be added in the future to the pool in collaboration with the Technical Committee and the special interest Working Groups.

4.2.4 Major Data Projects Alignment Coordination

As part of the SL-NSDI implementation program, the SL-NSDI project team will need to conduct an assessment of the major on-going GIS data projects and propose an alignment strategy in order to coordinate the development of those projects and the outcome data in a way that is normalized across the board based on common standards and practices. The GeoCentre shall continue this exercise in the future for both existing and new projects as they arise.

4.2.5 Data Standards Development

Data content standards provide a predictable and consistent basis for the development of FGDS layers that can be used effectively by the entire SL-NSDI community. The GeoCentre will facilitate and support data content standards development through participation in special interest Working Groups. The data standards development activities may materialize into community development projects as described under the community coordination and support section.

4.3 Infrastructure Development & Operations

The Infrastructure Development and Maintenance activity consists of the following:

- Development and Maintenance of Portal/ Data Clearinghouse
- Availability, Performance and Security Management
- Release Management
- Helpdesk Management

- Configuration and Change Management Support
- Technology Standards Development

4.3.1 Development & Maintenance of GeoPortal/ Data Clearinghouse

The computers, core software, peripherals, data networks, security, service delivery, management and other components comprise the essential computing infrastructure for the SL-NSDI. Some of these components are dedicated exclusively to SL-NSDI functions including those that are housed in the GeoCentre offices, while others are primarily used for other agency purposes, but provide access to SL-NSDI resources or otherwise indirectly support SL-NSDI functioning. The SL-NSDI computing infrastructure can be characterized as including the following major components listed below, primarily operating from within the Lanka Government Cloud computing environment:

SL-NSDI Web Portal. An SL-NSDI Portal website is to be developed to serve as the central point of contact for information about the SL-NSDI initiative, involved stakeholders, new information resources, and access to the Geospatial Portal. This Portal is intended to be an initial common resource and service to the SL-NSDI community, and will be updated and refined on a continuous basis. In the future, this should be expanded to include full Portal technology.

GeoPortal. An SL-NSDI GeoPortal is to be implemented to provide the community with a common metadata catalog and map services for viewing and using available geospatial data. During the SL-NSDI foundation program, this Portal will be used solely for accessing and viewing foundation data. In a later stage, the Portal functionality will be expanded to include advanced map services, including an advanced security layer and provision for data uploading and downloading. Other specialized application services may be added in the future.

Distributed Entity Nodes. It is expected that some other government entities will wish to host their own SL-NSDI node. Such nodes will allow agencies that have the technical and human capacity to administer their own facility that will interoperate with the central Geospatial Portal across a distributed network. Through this mechanism, SL-NSDI users will be able to search for data through the central metadata catalog, and then view and use the information from a single interface irrespective of where the data is physically residing.

Geospatial Data Clearinghouse. A central data clearinghouse will be used to publish information on behalf of agencies that have not yet developed their own geospatial portal node. This Clearinghouse will be managed and supported by the GeoCentre. Updates to the Clearinghouse database will be made by custodians based on community needs and the nature of each topical layer.

SL-NSDI GeoCentre. A physical facility will need to be developed to support the operations of the GeoCentre. This will include office space and specialized work and equipment spaces that are required for carrying out the work of the GeoCentre.

National Communications Network. The ICTA has implemented a Lanka Government Cloud computing environment across government for Sri Lanka. This provides effective connectivity among the SL-NSDI stakeholder entities, and thereby increases the ability to access and share distributed information through a real-time network.

GeoCentre Information Management System Architecture. The effective operation of the GeoCentre computing infrastructure as a common service facility for the benefit of the SL-NSDI community will require a technology framework of three interrelated "reference layers" designed to facilitate seamless data and information flow both within and across all layers. The framework is supported by a management framework to facilitate reliable service delivery and support as well as a security standard to ensure information confidentiality, integrity and availability. Two main goals of the framework are information sharing with public outreach and improved effectiveness of IT investments. The highest level is the Client layer whereby different client types are used to access the GeoCentre's applications. The Core Information Management Technology Layer which will integrate and interconnect the various components of the data-processing infrastructure: databases, platforms, and applications. The bottom layer, Computing Infrastructure, is based on physical technology devices that enable the IT infrastructure to guarantee an efficient, available, and secure environment.

Public Access. The GeoPortal and Data Clearinghouse will accommodate controlled access to the SL-NSDI data resources by the private sector, universities, civil society and the general public. Access to specific data and limitations on usage will be established through the SL-NSDI data security framework.

The GeoCentre will host an important node in the SL-NSDI network, inclusive of the national data clearinghouse. Thus it will be important for the GeoCentre to proactively manage its IT infrastructure and that business continuity is effectively supported by the ICTA Lanka Government Cloud computing environment to ensure the greatest value from the information technology resources and services and to secure the computing and network environment against threats or disruptions in service. The management framework will need to include four "transcending layers" inclusive of Service Delivery, Service Support, Infrastructure Management and Security. These all have interrelationships and provide functional support to the "reference layers" of the technology framework to provide service management, network and system

monitoring, business process monitoring and integrated security management methodologies, capabilities and products that will allow the GeoCentre infrastructure to operate efficiently and reliably.

4.3.2 Availability, Performance & Security Management

SL-NSDI system performance is critical for a successful system operation and utilization by the end users. The performance management function focuses on the design, development and deployment of performance management tools that support the monitoring and control of system performance according to pre-set metrics and performance benchmarks. It includes, but is not limited to, the following:

- Communication infrastructure monitoring tools
- Spatial information infrastructure Performance Management tools (database, network, applications)

Performance management monitoring tools maintain information related to adequate functioning and performance of the system based on pre-defined benchmarks. This may include metrics measurements, alarms and signals, status reporting, etc. The above information, which may be handled by a suite of software/ functional solutions that monitor applications and network tip-to-tip performance may be maintained in disparate applications that are hosted on the SL-NSDI data center platform, the network administration environment and possibly the stakeholder agencies platforms or nodes.

A dashboard interface may be developed as well that assembles all the metrics, signals and alarms as well as reporting requirements in one GUI environment where federated data is aggregated from disparate performance management systems.

Availability Management is the practice of identifying levels of IT Service availability for use in Service Level Reviews with Customers. All areas of a service must be measurable and defined within the Service Level Agreement (SLA).

To measure service availability the following areas are typically included in the SLA:

- Agreement statistics – such as what is included within the agreed service
- Availability – agreed service times, response times, etc.
- Service/Help Desk Calls – number of incidents raised, response times, resolution times
- Contingency – agreed contingency details, location of documentation, contingency site, 3rd party involvement, etc.
- Capacity – performance timings for online transactions, report production, number of users, etc.
- Costing Details – charges for the service, and any penalties should service levels not be met

Availability is usually calculated based on a model involving the Availability Ratio and techniques such as Fault Tree Analysis, and includes the following elements:

- Serviceability – where a service is provided by a 3rd party organization, this is the expected availability of a component
- Reliability – the time for which a component can be expected to perform under specific conditions without failure
- Recoverability – the time it should take to restore a component back to its operational state after a failure
- Maintainability – the ease with which a component can be maintained, which can be both remedial or preventative
- Resilience – the ability to withstand failure
- Security – the ability of components to withstand breaches of security1

Security can most commonly be defined as, "the management, operational, and technical safeguards and protections designed, developed and instituted for information systems and supporting computing and network infrastructure(s) intended to protect their confidentiality, integrity, and availability." Once implemented, security and its associated controls must be assessed to determine the extent to which it has been implemented correctly, is operating as intended, and is producing the desired results with respect to meeting the security requirements for the organization.

Security best practices generally indicate that a comprehensive security program, when correctly and successfully conceived, designed and implemented, will have three major components – Management, Operational and Technical.

- Management refers to the safeguards or countermeasures that focus on the management of risk and the management of information system security.
- Operational refers to the safeguards or countermeasures that primarily are implemented and executed by people (as opposed to systems).
- Technical refers to the safeguards or countermeasures that are primarily implemented and executed through tools, platforms, frameworks and mechanisms contained in hardware, software and network components.

The security related software tools may include the following:

- Firewall software (including the network firewalls and application)
- Internet security software
- Routers and switches security encryption and configuration software
- Security Zones and their associated software
- Network Traffic Encryption

[1] ***Availability Management and IT Security*** - IT Security is an integral part of Availability Management, this being the primary focus of ensuring IT infrastructure continues to be available for the provision of IT Services. Some of the above elements are really the outcome of performing a risk analysis to identify any resilience measures to be put in place, identifying just how reliable elements are and how many problems have been caused as a result of system failure. The risk analysis also recommends controls to improve availability of IT infrastructure such as development standards, testing, physical security, and the right skills in the right place at the right time, etc.

- TCP/IP Filtering
- Internet Protocol Security (IPSec)

4.3.3 Release Management

As a general rule, the GeoCentre is not in the software development business, and will give preference to COTs or well supported OpenSource solutions where these can adequately meet the needs of the GeoCentre and the SL-NSDI stakeholder community. However, there are needs that cannot be met with COTS technology and that need to be developed in-house to meet the SL-NSDI special needs. In these cases the GeoCentre will undertake to carefully maintain and manage outsourced software development to protect the investment and to optimize the benefits of the system, including establishing a software release policy by which such management will occur.

The purpose of a software release policy is to provide standards and procedures to control software developed under the guidance of the GeoCentre. This will improve the documentation, maintainability, and accountability of GeoCentre managed software development, and will decrease ad hoc and poorly planned/ implemented changes to software. All software documentation is retained in GeoCentre's Content Management System.

Before software designed and developed by the GeoCentre is released, it will be thoroughly tested, demonstrated to the requestor, and documented. The user will be trained. The responsible GeoCentre custodian will assign a release number and date that will appear when the software is run and that will be noted on all copies of documentation to support the software. The custodian will assign an initial release number and date to identify the software. Initial release numbers will end in zero. Software development at the GeoCentre will be treated as a project and will be handled in accordance with the Project Management guidelines discussed in this document. When a request for services is made that involves software development, an initial requirements analysis will be conducted. From that, a timeline for the initial software development will be developed and forwarded to the requestor. Every effort will be made to meet the schedules outlined in the initial time line, however, if the time line changes, the requestor will be informed.

The GeoCentre will also determine whether the software is Critical or Non-Critical, which will determine how often new releases will be made. The testing, demonstration to the user, documentation, and training must be satisfactory to the Technical Manager before software is released.

Software Reviews. After the baseline release, the software will be made available for use by the requestor and any other approved users. If changes are required once the software has been released, the requestor may generate a Project Request Form

to have the software changed. Software changes will not be made immediately, but will be held by the leader of the Group that designed the software to be incorporated in the next release of the software. Software systems maintained by GeoCentre will be reviewed every six months if the software is determined to be "Critical," or every twelve months, if the software is determined to be "Non-Critical."

Critical Software Release. Critical software is software that is determined by the GIO and the users, to be mission essential and requiring frequent updates. The Technical Manager will conduct a semi-annual review of all critical software and determine whether there have been requests to modify the software. If there are requests for changes, the Technical Manager will assign a Project Manager, and will review the scope of the changes with the Project Manager. The Project Manager will conduct a requirements analysis and develop a time line, following the procedures in the Project Management Section of this document. When the Technical Manager releases the software, the GeoCentre staff will assign an appropriate release number and date and will record the release in the history file for that piece of software. The release number reflects changes in functionality, technology, and performance.

Non-Critical Releases. Non-Critical releases are handled in a similar manner to Critical software, except that releases are made annually. A similar Project Management approach will be taken. If documentation requires only minor upgrade, page changes can be released. The GeoCentre staff will assign an appropriate release number and date and will record the release in the history file for that piece of software.

History of Releases. The GeoCentre will retain a history of each piece of software that is formally released. Included in the history will be the initial release number, date, and a list of documentation prepared for the release, training conducted prior to the release, Project Manager, and releasing authority, at a minimum. For releases subsequent to the original release, a brief summary of changes will be included in the history.

4.3.4 Help Desk Management

Perhaps the most important function in an IT service support organization is the Service Desk (i.e., Help Desk, Call Center). The primary goal of the IT Service Desk is to provide a single point of contact for customers and users and to facilitate the restoration of normal service with minimal business impact. Specifically designed to optimize communications regarding incoming requests, the Service Desk tool should ensure efficient and expeditious handling of customer interactions. The tools should provision for categorizing, routing, tracking, of all requests. It should provide published and open APIs that offer broad integration capabilities including integration with Network and

Systems Management products. The SL-NSDI will require that Service Desk personnel have familiarity with GIS and SL-NSDI specifications, or can route such issues to the GeoCentre Help Desk.

A limited technical consulting and support capability will be maintained to allow the GeoCentre to assist other organizations on an as-needed basis. Any such services that are beyond the normal operating functions of the GeoCentre will be charged to the receiving organization. Specific activities may include:

- Staff a help desk to handle technical support calls and the needs of walk-in clients
- Host a user knowledge base on the SL-NSDI website. The knowledge base would allow users to post and respond to technical support questions, exchange knowledge and find links to other types of support;
- Monitor technical support questions in order to identify common support related needs

4.3.5 Configuration & Change Management Support

The primary goal of the ITIL Configuration Management process is to achieve, through the implementation of Asset Management, a single integrated configuration management database for all configuration items. The application seamlessly supports Incident Management, Problem Management, Change Management, and Service Level Management processes. Configuration Management function is very critical for a successful and smooth operation and maintenance of the SL-NSDI Program. It deals with the entire process of change and configuration management related to the SL-NSDI system components i.e. data, applications, hardware, staff capacity building and procedures. It includes, but is not limited to, the following:

- System development automation procedures
- System maintenance automation procedures
- Logging and tracking SL-NSDI Enhancement Requirements
- SL-NSDI System Administration
- Helpdesk
- Other requirements

The GeoCentre will design and develop a configuration management strategy and internal support capacity, systems and tools that will be needed to support and manage the SL-NSDI Program operation. A configuration management plan should be prepared to ensure that the GeoCentre staff that will be in charge of the system operation and maintenance will have all the necessary tools and procedures to support their activities. This configuration management plan should be in line with the existing configuration management policies adopted by the GeoCentre. The objective is to define a configuration management process to manage the system routine operation activities:

- Change Management

- Quality Assurance/Quality Control
- Version Control
- Release Management

In order to support the above endeavor, the GeoCentre shall procure, customize and deploy a complete configuration management system. For more detail on the Configuration Management process, please refer to Annex K.

Change Management delivers a best-practice process to systematically manage the response to a change request in accordance with the ITIL framework. A Change Management application tracks a change from the moment it is proposed, through the implementation in the live environment, to the evaluation of the end result. The out-of-box Change Management capabilities facilitate the gathering of changes from all identified stakeholders into a change repository. It includes planning changes based on priority, impact, or urgency. Change Management considers business and technical impact, impact on other services, the effect of not implementing the change, as well as resources required. It includes use of a back-out plan and a robust approval server that manages the request through a complex approval process. It automatically assigns tasks needed to complete the change. If problems arise during implementation, automatic escalations and notifications are performed. Repeated changes can be completed consistently with change templates. Reports are used to evaluate changes for desired effect, on time, on budget. The use of a Change Board and an integrated software application is essential to maintain a proper balance of the need for change with the potential negative impact on other elements of the IT infrastructure. Change Management is an indispensable tool used by the Change Advisory Board as specified by ITIL.

4.3.6 Technology Standards Development

The Technology standards development includes the following:

Software procedures & standards. Software procedures and standards includes a description of any specific software standards and procedures related to open source, web enabled services, Service Oriented Architecture (SOA), Middleware, commercial off-the-shelf products, etc. The proposed developments are the following:

- The GeoCentre shall ensure that the SL-NSDI platform be built on open standards and interoperable and flexible software platforms
- The GeoCentre shall assess the current progress in the technology development lifecycle and ensure that the information technology architecture and infrastructure are built on solid grounds. For example, questions should be dealt with such as do we adopt a service oriented architecture (SOA) and web services and do we plan for the deployment

of middleware in the early stage of system development (i.e. in the SL-NSDI Strengthening phase) or not? And on what basis?

- It is recommended, especially during the early stages of system deployment, to rely on commercial off-the-shelf products (COTS) and refrain to go into customization to the extent possible. This will alleviate system operation and maintenance burden on the system administrators. Even though some of those requirements are policy related, some of them necessitate continuous monitoring and adoption of standards that define the framework for technology innovation and development

Computing Infrastructure procedures & standards. Computing infrastructure procedures and standards include, but are not limited to, procedures and standards related to computing infrastructure i.e. application, data and development servers, disaster recovery servers, workstations and peripherals. Developments in computing infrastructure may include the following:

- Keep abreast of computing infrastructure developments and setup a cutoff date for incorporation of latest specifications during the procurement processes
- Ensure that the proposed computing infrastructure is modular and expandable based on IT good practices and standards
- Ensure that hardware support services such as maintenance and warranty are in line with the IT strategy, and the adopted procedures and standards

4.4 Sustainable Development Planning Support

Where the SL-NSDI is intended to go beyond the focus of traditional NSDI on "supply-side" data sharing is in aligning the programme in a more integrated and proactive manner with national policy making, planning and development investment. This approach to next-generation NSDI, or "Smart Development Infrastructure (SDI+)" will ensure that the investment in geospatial technology and data can be more fully leveraged to maximum advantage and positive impact to Sri Lanka society. The following outlines those channels and linkages that will require further exploration and institutional alignment during the early stages of SL-NSDI development.

4.4.1 Physical Development Planning

There are many other organizations involved in various aspects of land planning, management and administration dealing with land tenure, utilities and infrastructure, environmental resource management, biodiversity conservation, tourism development and others that are carried out by multiple agencies at several levels. The effective coordination of all these initiatives to ensure synergy and sustainability represents a significant challenge. The SL-NSDI can play a significant role in ensuring more coordinated and integrated development planning and execution at multiple levels.

This includes ensuring access to the appropriate data and analytical tools, providing a common basis for tracking planning areas, taking a proactive role in supporting the identification and assessment of development integration and alignment activities and in ensuring that plan information is widely accessible across the involved stakeholder organizations.

4.4.2 Development Investment Support

At present there are many development investments planned or ongoing across the Country, but no "common operating picture" that would indicate where these projects are occurring, how they may relate to one another in time and space, nor what the cumulative effects on the environment or communities where they are taking place may be. Projects may be designed and developed by individual agencies in different sectors with little or no visibility to each other's planned activities, thus missing opportunities for coordination and in some cases creating conflicted conditions (e.g. newly paved road dug up again for a pipeline expansion project). The planning, design and construction of such projects often involves the use of geospatial technology, but without a mechanism for coordination, many projects may develop data that already exists or multiple projects may create the same data redundantly. Lack of data can result in ill-planned projects or extended timeframes for data collection to support required studies. The SL-NSDI GeoCentre office can provide a critical role in supporting the development investment process through multiple stages, including but not limited to:

- Common data coordination and access;
- Development investment analysis and development of prospective indicative pipeline of viable investment projects
- Project feasibility assessment analysis;
- Project design support with GIS data and analysis;
- Project construction management and tracking support;
- Project transition to operations and maintenance;
- Project monitoring and evaluation;
- Development investment GIS based common operating picture;

4.4.3 Sustainable Development Monitoring and Evaluation

The U.N. Sustainable Development Goals (SDG's) can provide a valuable metric around which to monitor and assess the achievement of the Country's development aspirations over time. The SL-NSDI will contain much of the data to understand the current status of SDG achievement and the geographic expression of these values across the country, thus providing the basis for place and community-based interventions that are not supported by national statistical reporting. SL-NSDI data and geostatistical analysis and visualization tools can be used to monitor conditions and create executive dashboards that can provide government leadership with evaluative data and a near real-

time "pulse" of issues across the country and measures of progress around which informed and evidence-based policy and decision-making can be conducted.

ANNEX A – WORKING GROUP CHARTER TEMPLATE

SL-NSDI Working Group Service

Prepared By	Reviewed By	Approved By	Issued By
Community Organisation Groups Coordinator	**Planning & Development Manager**	**Executive Manager**	**Xxxxxx**

Date of Approval	_____	Date of Issue	_____

Revision Record				
Revision No.	Date of Revision	Reasons and Details of Revision	Revisions Made at the Page No. & Para No.	Revision Reviewed & Approved By

Purpose

To describe the process of providing the service to initiate, manage, report and close an SL-NSDI Working Group.

Working Groups established to discuss and recommend actions that resolve a business or technology problem. A resolution is typically required by a specific date therefore this service is provided with the understanding that it concludes by the established completion date.

The completion date is defined by management or the person or persons requiring a resolution. Working Groups should not exceed 6 months in duration and objectives should be discrete and well understood so that the group can make its recommendations in the shortest time possible.

Scope

This service is considered a best practice process for discussing and resolving business or technology issues. The service is provided by the SL-NSDI GeoCentre as a support mechanism for the implementation and management of the Sri Lanka Government's Spatial Data Infrastructure (SL-NSDI).

The service is generic and can be provided by any service organization reliant on cross department/cross agency problem solving activities to improve business services, lower operating costs, produce innovative ideas, or new programs, etc.

GeoCentre reserves the right, after consultation with SL-NSDI community members, to update the provision of this service as necessary to ensure the service meets with customer demands.

Ownership Statement

Executive Manager, GeoCentre is responsible for ensuring the service is periodically reviewed for adequacy, suitability, applicability, and effective delivery relative to strategy and customer satisfaction.

References

- ISO 9001: 2008 (Clause- 7.2)

Abbreviations

SL-NSDI	Sri Lanka National Spatial Data Infrastructure	GIS	Geographic Information System

Terms and Definitions

Working Group (WG): An SL-NSDI Working Group is a group of representatives from 3 or more stakeholder entities formed to discuss and resolve a technology driven business or technology only issue; to provide options and make recommendations to entity management and/or GeoCentre leadership that resolve an issue, or advance technology implementation or business.

SL-NSDI Member: The SL-NSDI member refers to the entity which has been officially represented within the SL-NSDI community and is regularly participating in the SL-NSDI activities.

Issue: A business problem; a technology problem; or a conflict between 3 or more stakeholders.

Problem Statement: A documented statement clearly and unambiguously describing the issue which the Working Group is formed to resolve.

Charter: The Group's mandate, outlining its purpose and objectives, members and Group Lead, and guidelines for management.

Agenda: A list of aims or possible future achievements, or a list of matters to be discussed at a Group meeting.

Lead/Chair: The person(s) in charge of the Group and Group meetings. Responsible for scheduling Group meetings, issuing meeting agendas, meeting minutes and following up on assigned action items.

WG Coordinator: Person(s) assigned to the Group to support the Chair. Responsible for the administrative duties related to the management of the Group.

Actions Database: GeoCentre database designed for the recording and tracking of WG actions.

Escalation: The process for highlighting issues from Group discussions, non-conformance to Group activities, or delays in action competition to GeoCentre management.

E-mails: For the sake of executing procedures as per this document the e-mails will be considered as an official correspondence until superseded by an executed (signed) hard copy equivalent.

Responsibilities and Authorities

Executive Director is responsible for ensuring the necessary support mechanisms for the implementation and maintenance of the Sri Lanka Government's SL-NSDI program are developed as per the annual operations plan.

Planning & Development Manager is responsible for ensuring that the standard operating procedure (SOP) for Working Groups is followed, reviewed yearly (or when requested) and updated to ensure the service continues to meet customer demands and approval.

Community Organisation Group Coordinator has overall responsibility for the Working Groups service, including;

- Reviewing the need for the initiation of a Working Group and development of the problem statement.
- Monitoring the progress of the SL-NSDI Groups and maintaining the GeoCentre actions tracking database.
- Initiating the escalation process.

Working Groups Coordinator is responsible for the day to day operations for their assigned Group to ensure delivery of the objectives in the agreed timeframe.

Process and Procedures

Initiating a working group:

Responsibility	Activity	Documents/ Records
Anyone	Discuss business or technology issue Anyone can identify a potential or real problem through various means (meetings, ad-hoc conversations, etc) Outcome: The problem is real, should be addressed and the forum the problem should be addressed (informal meeting, coordination meeting, escalation to leadership, working group meeting, forward to existing committee) If working group is decided as best forum to resolve issue then proceed to define & document problem statement	No documents - Informal discussion among team members
GeoCentre team CO Groups Coordinator	Define Problem Statement The Problem statement is documented and emailed (circulated) to the senior GeoCentre team for review, comment, refinement and validation.	Email: Problem Statement.

	Outcome: The problem statement validated by team. Iterate until majority consensus.	
GeoCentre Management CO Groups Coordinator	Validate the Problem Statement The problem statement is emailed to GeoCentre/GeoCentre leadership for review, edit and/or validation. GeoCentre leadership email authorization to proceed with working group initiation; include desired timeframe to complete if appropriate	Email: Problem Statement Amendment or Email: Problem Statement Agreement
CO Groups Coordinator WG Coordinator Proposed Members	Develop Proposed Charter: Identify members, chair, objectives, time frame Develop proposed charter using template Email proposed charter to senior team for review and sign off Call chair and key members to inform of proposed working group Email proposed charter to working group members; request feedback	Working Group Process Map Charter Template
WG Coordinator Chair Members	Adopt Final Charter; Review charter with working group Develop agenda for first meeting Schedule and conduct first meeting Obtain consensus on problem statement, objectives, tasks and time frames; Make changes as necessary and get initial from group to signify agreement with tasks and timeframe; Develop high level agenda for subsequent working group meetings Do as much as you can in first meeting Schedule next meeting Minute the meeting with actions Email minutes to group	Proposed Charter Final Charter Meeting agenda Meeting minutes Email

Manage Working Groups

Responsibility	Activity	Documents/ Records
Chair WG Coordinator Members	Agenda Management Define proposed Agenda for each meeting based on accomplishments or issues raised from previous meetings and charter tasks and timelines; ensure agenda advance the problem resolution with timeline in mind	Working Group Process Map Agenda

	Email proposed agenda to group at least 3 days in advance of a meeting but always respect the schedules and work load of members and give as much notice as possible. Edit or add any additions but ensure agenda directs work to complete by the established due date. Chair controls meeting Discuss agenda; identify actions; Review actions at end of meeting and ensure group is in agreement; Spend extra time to ensure actions are clarified and those responsible fully understand their commitment Minute meeting; email minutes to group Enter actions into actions log	Minutes Actions log Actions Tracking database
CO Groups Coordinator WG Coordinator	Action tracking & Escalation Process Log all actions into Actions tracking database Review weekly or as frequently as needed to ensure actions are completing on time and immediate follow up when an action is likely to not complete on time. Follow escalation process for actions near completion or overdue Review action progress and escalation points with GeoCentre team weekly	Actions tracking database Escalation process map Weekly reports

Reporting

Responsibility	Activity	Documents/ Records
CO Groups Coordinator WG Coordinator	Weekly Reporting Enter working group status into weekly reports Meet weekly with GeoCentre team to review weekly progress, escalation points and overall team coordination Highlight escalation points in red; potential future escalation points in yellow Fill in performance measures excel Update dashboard Update website, SharePoint section Email working group (and associates) with update (this may be accomplished by SharePoint through alerts) Monthly Reporting Update Monthly power point report Update website, SharePoint section	Actions Log Weekly Reports Monthly Reports Performance Measurements excel GeoCentre website SharePoint Website Email

Closing a Working Group

Responsibility	Activity	Documents/ Records
WG Coordinator Chair CO Groups Coordinator	Final Meeting The final meeting is a regular meeting but known prior that it is the last meeting; all tasks are completed, and members agreed this is the final meeting. Discussion may ensure on next steps or other problems to address GeoCentre presents 'Certificate of Achievement' to members and chair. Thanks everyone for their hard work and dedication. Official Closing Memo WG Coordinator drafts 1 page memo summarizing accomplishments and thanking members Memo is reviewed by GeoCentre team and/or chair and on approval is translated into Arabic Memo is circulated by chair to members (and cross circulation (cc) associates & supervisors) WG Coordinator prepares updates for GeoCentre website press release and SharePoint. Reviewed and sign off by CO Groups Coordinator	Minutes Certificate of Achievement Official Memo template Official Memo Email SharePoint GeoCentre website

Measurements

Responsibility	Activity	Document/ Record
CO Groups Coordinator	Maintain Performance Measures CO Groups Coordinator updates performance measures excel weekly as part of the weekly reporting process	Performance Measurement excel

Continual Improvement Plan
Not Applicable

Records

Records	Responsibility	Retention Period
Utilization reports generated from the system	GeoCentre Operations Manager	1 Year

Attachments

Attachment #1 – WG Charter Template (Short Form)

Type of Access	Access Description	Notes
Open	All members	Online user manuals will be published on the portal

Attachment #2 – WG Closing Memo Template

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #3 – List of computer files used to manage working groups

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #4 – Example Certificate of Achievement

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #5 – WG Invitation Template

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #5 – WG Minutes Template

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #6 – Performance Measures Template

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #7 – Escalation Process Map

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #8 – Working Group Process Map

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #9 – Web Reporting data model

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

Attachment #10 – Actions Tracking Template / Manual

Type of Access	Access Description	Notes
Open	All members	Online SOP manuals

ANNEX B – SPECIAL INTEREST GROUP CHARTER TEMPLATE

Special Interest Groups (SIGs) are permanent sub-bodies of the SL-NSDI Community; they serve as a forum for cross disciplinary, sector-orientated collaboration on those aspects of SL-NSDI and related matters that are most relevant within their community of practice.

Special Interest Groups (SIG) consist of representatives from SL-NSDI member entities and subject-matter experts around geospatial data themes or persistent topical areas such as, Public Safety and Security and the Environment. The Group is a forum for discussion and action on the strategic issues related to the implementation of the e-Governance Programme and SL-NSDI initiative, for example; policy recommendations, use of standards and specifications and roll out, business guidelines, and issues pertaining to privacy and security.

At any time, an SIG may request the formulation of a Working Group(s) in order to tackle specific topics of interest from the SIG's scope or topical area.

It is considered that the purpose of the SIGs will continue and develop, providing a 'think-tank' for all governance related issues; expanding in representation to all government and key external agencies, committed to the continued development of the Emirate and it's ambition to be one of the five top governments in the World.

SIG Member Selection

Special Interest Groups are an association of individuals or organizations formally organized, on the basis of one or more shared concerns, to attempt to influence public policy in its favour. They provide a channel for special expertise to be made available to decision-makers, and for particular concerns to be brought to their attention.
Entities may be represented in one or several Groups. On the initiation of a new Group, the Group Coordinators liaise with the Entity Account Manager and the Entity Representative to select the most suitable representative(s) for the Group(s). The diagram below (Figure 1.2) highlights some of the key criteria for SIG member selection.

It is expected that SIG members are from a level within their organization where they; influence or delivery policy recommendations; authorize operational strategy initiatives; have an overview of the e-government strategy and understanding of its impact and influence on society.

SIG Responsibilities

The Group responsibilities include, but are not limited to, the following;

- Act as a forum to discuss best practices by Government organisations on a national, regional and municipal level.
- Consider the growing trend, traction and importance of the subject sustainability and its related activities in Sri Lanka.
- Define the different needs by various stakeholders for geospatial data.
- Confer on the best mechanism for collaboration in the future to avoid redundancy while meeting the common needs of the different members in the SL-NSDI Community.
- Establish a forum for sharing information and news.
- Address areas of policy, regulatory, and institutional practice that will have an impact on the SL-NSDI.
- Facilitate access to resources such as, the web-based Geoportal.
- Identify areas that can be instigated and facilitated by the SIG members.
- Propose the development of tools and methods to stay up-to-date on entity related projects and/or activities (for example, the development and maintenance of a dedicated channel on the SL-NSDI Portal).
- Contribute toward the development and execution of key events outreach and communication.
- Facilitate the development and coordination of agency activities.
- Promote the publication of digital spatial data.
- Assist GeoCentre to establish and publish standards, specifications and strategic priorities.
- Promote entity responsibility in complying with SDI standards and thus institutionalizing SDI standards, in consensus with the entities and help cross-agency coordination in data sharing and information exchange.
- Promote Emirate-wide use of defined and published spatial data transfer standards.
- Support development of the Sri Lanka Spatial Data Infrastructure through facilitation of partnerships and definition of data framework standards.
- Identify ways in which data from any source may be included in the Sri Lanka Spatial Data Infrastructure.

SIG Coordination

Each Group shall be chaired by an individual approved by the Group, and agreed by the Executive Committee and Technical Committees.

Where multiple representatives volunteer for the Group Lead (Chair) position, or for instances where there is no volunteer, GeoCentre management will make an assignment, either from the member entities or from the GeoCentre staff.

Meetings shall be held at the call of the Group Lead, and shall be held at least biannually.

All decisions shall be on the basis of consensus agreement. Where an agreement is not reached, the issue will be promptly referred to the Executive Committee for resolution.

The Group Lead will coordinate the Group's activities with other SL-NSDI Groups by participating in SL-NSDI meetings.

The Group will employ those tools that are best suited to meeting its responsibilities, such as Group meetings, nationwide user forums, user surveys and analyses, workshops, and research initiatives.

1. Follow-up Mechanism

Normally, the Group Lead will give notification and an agenda will be distributed to Group members and the Group Coordinator, 10 working days in advance of the meeting.

The Group Lead is responsible for organizing the provision of a draft report of Group meetings (MoMs), including recommendations and action items, to all Group members and SDI Group Coordinator for review prior to approval.

On approval, the Group Lead shall provide the final report of Group meetings to all members, Groups Coordinators, GeoCentre management, if required, the SL-NSDI Technical Committee.

The SDI Group Coordinators may take responsibility for the Group administration tasks at the request of the Group.

2. SIG Documents

Each Community Organization Group is initiated for a specific purpose. A Special Interest Groups general purpose is, for continued cross-sector collaboration to influence policy and provide guidance for decision-makers on a spatially related topic

Each Group is required to produce a Charter; this is the Group's mandate which outlines its scope or purpose, the members and Group Lead, and its operational guidelines or objectives. The Charter is a "living" document which is updated throughout the lifecycle of the Group.

GeoCentre Team Responsibilities

- The Group Coordinator's responsibilities include, but are not limited to, the following:
- Facilitating the initiation of a new Special Interest Groups, including the preparation of the framework papers, i.e., the Charter.

- Identifying the Group members in collaboration with the Entity Account Manager and Entity NSDI Representatives.
- Setting the agenda for, and organising the initial meeting, and assistance for any meetings of special junctures, e.g. workshops, etc.
- Promoting consensus with the participants on the Group's Charter and Group Lead.
- Monitoring and reporting on Group performance through the SIG Dashboard.
- Follow up on all actions items with, or in coordination with the Group Lead(s).
- Review the requirement for new Working Group, and facilitate initiation process.
- Communicating the status of 'Standards development' in relation to the Project / Class / Theme/ Topic to the DP team to monitor the progress of standards development related to each project.
- Transfer of any the gathered (formal / informal means) intelligence and knowledge on all projects that may have spatial components or relate to ICT/e-gov initiatives for assessment by the Data Projects team.

ANNEX C - GEOCENTRE STAFF JOB DESCRIPTIONS

The following are draft job descriptions for each of the positions that have been identified for the GeoCentre. These positions will be filled as qualified candidates are recruited. As with any recruitment program, the job descriptions may need to be adjusted during the hiring process to reflect any shuffling of roles and responsibilities depending upon the skill sets of the high-potential candidates. Position descriptions have been structured in a form suitable to support the recruitment process. The following positions are included:

12. Geographic Information Officer (GIO)
13. Secretary
14. Outreach Coordinator
15. PM/GIS Consultant
16. Sustainable Development Support Coordinator
17. Technical Manager
18. Geospatial Data Specialist
19. Systems and Database Administrator
20. Geospatial Portal Specialist
21. GIS Analyst
22. Help Desk Operator

1. Geographic Information Officer (GIO)

POSITION:	**Geographic Information Officer**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Sri Lanka Spatial Data Infrastructure (SL-NSDI) is conceived as a national initiative to harmonize, integrate and optimize the development and sharing of fundamental geographical and statistical information across all government agencies and institutions. The development of this program is being carried out through a step-by-step, practical process that will establish a strategic and evolving framework for a long term SL-NSDI, and provide coordination and support to the development of its various components through a carefully conceived and guided incremental process. The Geographic Information Officer (GIO) is to be commissioned to support the SL-NSDI program implementation; he or she is intended to be a person with primary responsibility for overseeing and coordinating the SL-NSDI Strategic Plan

Implementation, and overseeing the ongoing development and operations of the GeoCentre.

Duties and responsibilities of the GIO include, but are not limited to:

- Oversee the overall management and administration of the GeoCentre;
- Provide leadership and guidance to all GeoCentre staff;
- Serve as primary liaison between the GeoCentre and GeoCentre management;
- Define priorities, policies and strategies for consideration by GeoCentre;
- Provide direct management guidance to the Administrative Support, Technical Manager and Outreach Coordinator roles;
- Prepare GeoCentre annual plans, with support of other senior staff;
- Review and approve all project and activity plans and budgets;
- Review and approve all major staff resource allocations;
- Support senior staff in preparing and implementing operational plans for their areas of responsibility;
- Review program status reports and take action to mitigate any issues;
- Provide consulting support and guidance to any GeoCentre projects or activities on an as-needed basis;
- Perform annual staff performance evaluations.

QUALIFICATIONS: A Bachelor's degree (Master's or PhD preferred) with 10 or more years of previous agency or program management or equivalent experience in a related field. The candidate will ideally have both a theoretical and practical understanding and experience with GIS technology, spatial data infrastructure, and the development of multiple agency information sharing federations. The candidate must be highly motivated and must demonstrate proficiency in both bilingual (Arabic/English) verbal and written communication and possess excellent interpersonal and team organizational skills. This position requires a strong team leader with the ability to oversee many diverse activities simultaneously, and to interact with executive management in all the participating agencies. The candidate must be proficient in understanding complex problems and situations and be able to develop strategy and policy recommendations to benefit the SL-NSDI program.

2. Secretary

POSITION:	**Secretary**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: Under the general supervision of the Senior Office Manager, provides administrative, clerical and logistics support to GeoCentre. This person also serves as confidential assistant and functions as the key support staff person in coordination and implementation of the GeoCentre's day-to-day office operations.

The duties and responsibilities include, but are not limited to, the following:

- Receive and direct incoming telephone calls, assists all calls when possible and transfers others to the appropriate staff for handling; greets and assists visitors and clients.
- Provide clerical support for the office such as typing, filing, answering phones and take accurate messages and maintains records; sort and distribute mail; prepare and send various mailings; prepare check requests accurately assigning appropriate general ledger account numbers, petty cash and travel reimbursements; copy documents and presentation materials.
- Coordinate set-ups for meetings; calendars for establishing meeting times and locations; prepare room requisition, order and coordinate refreshments, and assist where needed.
- Order and inventory office supplies to ensure the smooth operation of the office.
- Prepare correspondence, report and memoranda involving confidential matters, moderate amounts of computation and confidential financial matters. Uphold the confidentiality of the GeoCentre, handling all information on a need to know basis.
- Attend selected GeoCentre meetings and provides minutes, as requested by GeoCentre staff. Provide coordination of on-site and off-site project meetings and seminars. May be required to provide transportation for GeoCentre personnel to and from airport and/or meeting areas.
- Prepare completed proposal packages for distribution to various agencies.
- Manage all staff and interns timesheets and ensure their accuracy.
- Contribute to overall office functions by accomplishing related duties as needed.
- Perform other duties and special projects as assigned or directed by the Senior Office Manager.

MINIMUM QUALIFICATIONS: Position requires a high school diploma or equivalent with two (2) to three (3) years of additional coursework in related fields such as business, secretarial, computer software/word processing and spreadsheet programs. Requires significant self-direction including the ability to prioritize daily work and maintain high productivity. Considerable knowledge of secretarial procedures and word processing (MS Word, Excel, and Outlook), basic math skills and knowledge of recordkeeping required. Must possess exceptional communication, organizational and customer service skills. Ability to interact effectively with on and off-site contacts and handles multiple tasks with tight deadlines.

3. Outreach Coordinator

POSITION:	**Outreach Coordinator**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: This person will coordinate with the SL-NSDI Program staff to identify key opportunities for publicizing, both nationally and internationally, the progress and development of the SL-NSDI Program and its resulting outputs to the SL-NSDI using the Geospatial Portal website a and other communication channels such as special events, seminars, exhibitions, conferences and other affairs. In addition, the Outreach Coordinator will work with the SL-NSDI Technical Committee to prioritize the development of those products that will showcase the SL-NSDI initiative and leverage external relationships and publicity.

Duties and responsibilities include, but are not limited to:

- Participate in international conferences related to SL-NSDI;
- Maintain and implement the SL-NSDI Outreach and Communications Plan;
- Establish and maintain ties with SL-NSDI related international initiatives and other national SL-NSDI programs such as the Global Spatial Data Infrastructure (GSL-NSDI) organization;
- Transfer experience and knowledge from the international SL-NSDI community to the SL-NSDI community;
- Prepare periodical newsletters to keep the SL-NSDI community abreast of each other's developments and achievements;
- Identify SL-NSDI related conferences, workshops and seminars and promote attendance by stakeholders;
- Organize local SL-NSDI related conference, workshops and seminars;
- Establish and maintain stakeholder relations management system;
- Coordinate with GeoCentre management the development of normalized training and capacity building programs that benefit the entire SL-NSDI community;
- Oversee the development of pilot projects, "quick win" projects and showcase initiatives and ensure their propagation to the rest of the SL-NSDI community.

MINIMUM QUALIFICATIONS: The candidate should have at least a business and management background such as a Bachelor of Commerce which is complemented by a strong GIS background. He or she shall have equally excellent marketing and communication skills and five to 10 years experience.

4. PM/ GIS Consultant

POSITION:	**PM/ GIS Consultant**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The PM/GIS Consultant will report to the GIO. He acts in the position of a generalist consultant with a wide experience in a multi-sector environment. He has strong planning and analytical skills, business and management experience and well rounded GIS background and experience. He can plan a role of a project manager on specific assignments with well defined scope, resources and duration or a program oversight manager.

The duties and responsibilities include, but are not limited to, the following:

- Act as a task force manager for the development/ update of the SL-NSDI Strategic Plan;
- Work with the GIO to update stakeholder situation assessment, needs assessment, program design, and implementation strategy especially in the context of addition of new stakeholders;
- Handles the assignments delegated to him by the GIO such as the management of specific projects or the oversight responsibility of specific activities under an ongoing program development;
- Is responsible for tracking and reporting progress for all activities in this area;

MINIMUM QUALIFICATIONS: The PM/GIS Consultant shall have a bachelor degree in engineering or equivalent experience. A minimum of eight years experience is required with exposure to multi-sector disciplines in enterprise GIS and/or Spatial Data Infrastructure Programs. He or she shall have excellent verbal and written communication skills in English.

5. Sustainable Development Support Coordinator

POSITION:	**Sustainable Development Support Coordinator**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Sustainable Development Support Coordinator will report to the GIO. He acts in the position of a planning support coordinator with a wide experience

in the use of geospatial tools and data in supporting physical planning and development investment. He/She has strong land use and resource planning, investment and analytical skills, institutional and management experience and well-rounded GIS background. He/She will coordinate with those entities involved in physical planning and development investment activities to ensure that the SL-NSDI resources are aligned with those activities and being used effectively for maximum positive impact to the Country's development aspirations.

The duties and responsibilities include, but are not limited to, the following:

- Act as a coordination point between the GeoCentre and those entities and programs involved in physical planning and development investment;
- Work with the GIO to identify program requirements and the strategic allocation of GeoCentre resources to best support those requirements;
- Identify planning and investment project alignment opportunities and report these to the involved entities and the Executive Committee for deliberation and decision making;
- Maintain sustainable development goal data and make dashboards available to executive leadership;

MINIMUM QUALIFICATIONS: The Sustainable Development Support Coordinator shall have a Masters degree in land use planning or equivalent experience. A minimum of eight years experience is required with exposure to broad range of sector planning disciplines and the application of GIS technology within these domains. He or she shall have excellent verbal and written communication skills in local language and English.

6. Technical Manager

POSITION:	**Technical Manager**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Technical Manager will be a single person who has technical expertise in all aspects of information technology management, geospatial analysis including GIS, remote sensing, programming and cartographic production. This person will report to the GIO and be responsible for coordinating all the technical staff, including the Systems Administrator, the Geospatial Data Specialist, GIS Analysts, and the Web Programmer. This person will also be responsible for the technical management of GeoCentre projects and operations, technical resource allocations and technical staff assignments to projects and activities. It will also include oversight of

the content aspects of the SL-NSDI Geospatial Portal and associated metadata, and data services, as well as the development and management of any associated application services.

Duties and responsibilities include, but are not limited to:

Management and Administration:

- Develop project plans to implement strategic program goals. Conduct project assessment and performs task planning to identify milestones, resource needs, schedule, and budget recommendations;
- Plan, lead and manage tasks such as needs assessment, design, implementation and evaluation;
- Provide top-level technical support for a staff of research analysts, application engineers, and GIS professionals
- Oversee multiple projects and support project leaders in managing project teams;
- Lead proposal development efforts, prepare grant applications, support project development and institute outreach efforts; and act as senior technical editor for all documents.

Analysis and Research

- Track current trends, evaluate, recommend, and support implementation of emerging technology for GIS, hardware, software, and information science for ongoing and planned projects;
- Develop and deliver presentations and demonstrations to SL-NSDI community, project management, staff, colleagues, and clients;
- Prepare and present conference papers, technical and design documentation.

Technology Management

- Supervise development and implementation of computing infrastructure and management strategies;
- Maintain and apply knowledge of information science principles, including relational and object-relational database design, software development concepts, knowledge management, decision support and information architecture concepts.
- Train staff and others via mentoring, peer-to-peer coaching, or group instruction;
- Support GIS technology planning for various academic programs, including Master of Science in GIS;

MINIMUM QUALIFICATIONS: The candidate should have a Master's Degree in computer science, geography/geographic information science, systems/operations management, or closely related field. He or she must also have five or more years of relevant Information Systems and GIS technology and/or programming experience, and an equivalent level of relevant project management experience with clear demonstration of having successfully handled increasing team supervision and project management responsibilities. The candidate must have the ability to thrive in a multi-project environment with minimal supervision and multiple priorities while exercising

personal initiative, excellent analytical and problem-solving skills. The position also requires excellent interpersonal and leadership skills as well as exceptional verbal and technical writing skills.

TECHNICAL SKILLS QUALIFICATIONS

- Extensive experience with the application of information technology and in-depth knowledge of GIS theory, methods and technologies;
- Expertise with spatial analysis, network modeling, raster modeling, and statistical analysis techniques;
- Experience with current Microsoft operating systems, software, and development environments including desktop and server products, web services, and the .NET development framework;
- Experience in administration and use of MS SQL Server for spatial databases;
- Extensive experience with object-oriented analysis and design methods for application development. Additional application design and programming experience with one or more of languages: C, C++, Java, C#, ASP, Visual Basic for Applications (VBA), VB.NET, XML, Python.

7. Geospatial Data Specialist

POSITION:	**Geospatial Data Specialist**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Geospatial Data Specialist will be responsible for the oversight and facilitation of all issues related to the establishment and operation of all fundamental geospatial data sets (FGDS) for the SL-NSDI. This includes participation in all FGDS Working Groups, development of data models, establishment of service level agreements (SLA's) between the GeoCentre and the stakeholder agencies, and monitoring and follow-up to ensure continuous compliance with the terms and conditions of all FGDS SLA's.

Duties and responsibilities include, but are not limited to:

- Maintain the master FGDS framework data plan and associated documentation concerning current status, identification of data custodianship, participation in associated FGDS Working Group, terms and conditions of any existing service level agreements (SLA's), and other issues related to each FGDS topic;
- Follow-up on all FGDS-related SLA's to ensure that the documented commitments are being complied with;
- Participate in all FGDS-related Working Groups;

- Oversee the maintenance of the master geospatial metadata catalog to ensure that all records are entered correctly and maintained by the appropriate data custodians;
- Perform research in terms of existing or emerging data modeling concepts, principles and practices, and make the findings of this research available to the SL-NSDI community, in coordination with the GeoCentre Outreach Coordinator;
- Identify conferences, seminars and workshops that may be informative or otherwise beneficial for FGDS custodians to participate in, and make this information accessible to the SL-NSDI community, in coordination with the GeoCentre Outreach Coordinator;
- Ensure that all FGDS data layers are accessible through the SL-NSDI data clearinghouse, or through distributed agency nodes, in compliance with previously defined SLA's.

MINIMUM QUALIFICATIONS: The candidate should have at least a Bachelor's Degree in computer science, geography/geographic information science, or closely related field. He must also have five or more years of relevant Information Systems and GIS technology and data management experience, and show a strong background in spatial data modeling theory, principles, and methods. Because this position involves direct contact and collaboration with every FGDS custodian agency, as well as other agencies that may participate in the various FGDS Working Groups, this person must also have well developed interpersonal skills, and must be able to facilitate and support multi-agency team activities and interactions.

8. Systems and Database Administrator

POSITION:	**Systems and Database Administrator**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Systems and Database Administrator will work under the general direction of the Technical Manager and will be responsible to ensure that the computing infrastructure and geospatial databases and applications are kept in running condition and administered in a systematic and effective manner. The Systems Administrator is directly responsible for definition of information systems needs, systems security, refining system requirements, implementing systems, and maintaining existing systems. This person is also responsible for ensuring that backup needs for individual servers are satisfied. The Systems Administrator will be responsible for a range of operating systems, including variations of Unix and Microsoft operating systems. The Systems Administrator will support a wide range of specialized

hardware including large-format printers and high-speed scanners and other peripherals.

Duties and responsibilities include, but are not limited to:

- Handle technical administration of existing systems including security, adding/removing user accounts, configuration of system parameters, adding/configuring peripheral devices, and servicing user requests;
- Direct activities of technical support technicians;
- Provide upper-tier technical support for a variety of customer hardware/software issues;
- Work with the Technical Manager to prepare systems plans and follow up their execution;
- Coordinate directly with ICT professionals in other SL-NSDI stakeholder agencies on systems administration issues;
- Install and maintain operating systems and third party applications;
- Collaborate with GeoCentre staff to develop and define system hardware and software needs with guidelines established by the Technical Manager;
- Perform other system management duties as assigned or directed;
- Frequently serve on technology-related committees and/or teams to help facilitate collaborative technology direction for the GeoCentre;
- Develop and maintain standards and policies for system requirements, security, and usage in collaboration with the Technical Manager;
- Support technology assessment and future systems planning, including resource and budget recommendation.

MINIMUM QUALIFICATIONS: The candidate should have at least a Bachelor's degree in information and communications technology (ICT), or the equivalent, and at least 5 years on-the-job experience in systems administration and technical support. The person must demonstrate a working knowledge of systems administration principles, practices and tools. Certification in Information Technology Infrastructure Library (ITIL®) or equivalent systems administration best-practices is desirable.

9. Geospatial Portal Specialist

POSITION:	**Geospatial Portal Specialist**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: The Geospatial Portal Specialist is responsible for the design, development and maintenance of the SL-NSDI Geospatial Portal. The Geospatial Portal shall ensure the Portal development and operation are compatible with international

good practice and the IT standards adopted by the government boy that his hosting the portal services.

Duties and responsibilities include, but are not limited to:

- Develop/ update the Geospatial Portal specifications;
- Monitor development in the Portal technology and propose enhancements/ upgrades as necessary;
- Ensure the development, customization and configuration of the Geospatial Portal services;
- Discuss with the stakeholders the requirements for extra/ enhanced services on the Portal and assess the feasibility of such developments;
- Ensure the provision of both English and Arabic services on the Portal;
- Report to the Technical Manager on the performance, utilization, developments and future plans for the Geospatial Portal.

MINIMUM QUALIFICATIONS: The candidate should have at least computer science training with a strong GIS background applied in the area of Geospatial Portals developments. A minimum of 5 years is required with a minimum of two years experience in Geospatial Portal developments and/or operations supplemented by a well rounded IT background.

10. GIS Analyst

POSITION:	**GIS Analyst**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: Several GIS Analysts will be required initially to provide basic technical and analytical support to the participating stakeholder agencies, while also ensuring production of SL-NSDI program products and services. The GIS Analysts will work also under the general direction of the GIO or Technical Manager. Analysts may have specialization in particular areas such as system and database design, spatial analytical procedures, cartographic design and programming. In addition, the Analysts should have the capability to produce high-quality applications and outputs necessary to demonstrate the effectiveness of the SL-NSDI program and meet the objectives of the participating stakeholder agencies. There may be different levels of GIS analysts depending on their experience. In the context of this report, the Senior GIS Technical Analyst is referred to in this sense.

Duties and responsibilities of the GIS Analyst include, but are not limited to:

- Apply his strong background using Advanced GIS software and related products such as advanced spatial and 3D analytical tools, thematic mapping, trend analysis, etc…in a project and production environment;
- Work with the GIO, Technical Manager and Outreach Coordinator to support technical GIS analyst activities, data inventory and assessment, derivative data products and support special projects;
- Rely on his strong conceptual and practical understanding of spatial database design, including relational database design and spatial data integration, GIS application software development and spatial analysis, data automation procedures, including vector and raster data automation techniques, data standards, and quality assurance procedures;
- Utilize his hands-on experience in packaging systems, tools and methods in a considerably short period of time in order to answer requests by upper management for specific reporting needs that support decision making;
- Is responsible for tracking and reporting progress for all activities in this area.

MINIMUM QUALIFICATIONS: The candidate should have at least a Bachelor in computer science, engineering, geography or mathematics that is supplemented by a strong GIS background with 2-3 years experience. He should have very strong analytical skills with application in a GIS analysis and reporting environment for decision making. He shall be able to translate the functional requirements that are described to him by his supervisors into workable solutions with tangible outcome using any combination of GIS tools, methods and adhoc custom applications developed by him in order to resolve the problem as stated by management: this could be a feasibility study, a thematic spatial representation or a complex reporting tool that supports decision making by upper management.

11. Help Desk Operator

POSITION:	**Help Desk Operator**
MONTHS/HOURS:	Full Time
STARTING SALARY:	Commensurate with experience
AVAILABLE:	Immediately
POSTING DATE:	
APPLICATION DEADLINE:	

DESCRIPTION: At least one permanent staff should be allocated to operate and maintain a help desk function for the SL-NSDI. Initially, this role may be filled by the senior administrative assistant, but it is expected that the level of traffic in this area will increase significantly as more organizations start to utilize the SL-NSDI infrastructure on a more regular basis. Eventually, it is expected that this will be a full time occupation to receive, log, analyze and respond to requests for information or support, or to route such requests to the appropriate person or agency.

Duties and responsibilities include, but are not limited to:

- Receive the calls and trouble tickets from the clients;
- Open trouble tickets and log complaints information;
- Assign trouble tickets to the concerned staff;
- Track work-in-progress until the ticket is closed;
- Inform the client and ensure that the process of follow-up with the client is satisfactory;
- Notify the technical manager of tickets that are critical or urgent;
- Prepare and distribute periodical reports to the stakeholders;
- Participate in internal meetings related to help desk support.

MINIMUM QUALIFICATIONS: The candidate should have at least a technical education with a strong background in the general use of computer and help desk applications. He should have been involved for at least a year in GIS activities or projects and has gained a good understanding of GIS operational issues. This shall allow him to have a good understanding of the issues that are raised by clients and consequently to process them to the appropriate persons for resolution.

ANNEX D - SL-NSDI HIRING & RETENTION FRAMEWORK

1. Hiring

The hiring practice should be based on best practices and should be an integral part of the Human Resources Management Policy. The check list below provides a reference that helps the manager keep track of the recruiting efforts. The hiring checklist communicates both the recruiting and the hiring process and progress in recruiting to the hiring manager.

- Determine the need for a new or replacement position;
- Think creatively about how to accomplish the work without adding staff (improve processes, eliminate work you don't need to do, divide work differently, etc.);
- Hold a recruiting planning meeting with the recruiter, the HR leader, the hiring manager, and, potentially, a coworker or internal customer;
- Develop and prioritize the key requirements needed from the position and the special qualifications, traits, characteristics, and experience you seek in a candidate. (These will assist the Human Resources department to write the classified ad; post the job online and on your website; and screen resultant resumes for potential candidate interviews.);
- With HR department assistance, develop the job description for the position;
- Determine the salary range for the position;
- Decide whether the department can afford the position;
- Post the position internally on the "Job Opportunities" bulletin board for one week. If you anticipate difficulty finding a qualified internal candidate for the position, state in the posting that you are advertising the position externally at the same time;
- Send an all-company email to notify staff that a position has been posted;
- All staff members encourage talented, qualified, diverse internal candidates to apply for the position. (If you are the hiring supervisor, as a courtesy, let the current supervisor know if you are talking to his or her reporting staff member.);
- Interested internal candidates fill out the Internal Position Application;
- Schedule an interview, for internal candidates, with the hiring supervisor, the manager of the hiring supervisor or a customer of the position and HR. (In all cases, tell the candidates the timelines you anticipate the interview process will take.);
- Hold the interviews with each interviewer clear about their role in the interview process. (Culture fit, technical qualifications, customer responsiveness and knowledge are several of the screening responsibilities you may want your interviewers to assume.);
- Interviewers fill out the Job Candidate Evaluation Form;
- If no internal candidates are selected for the position, make certain you clearly communicate with the applicants that they were not selected. Whenever

possible, provide feedback that will help the employee continue to develop their skill and qualifications. Use this feedback as an opportunity to help the employee continue to grow their career;

- If an internal candidate is selected for the position, make a written job offer that includes the new job description and salary;
- Agree on a transition timeline with the internal candidate's current supervisor;
- If you've created another internal opening, begin again;
- End the search;
- If no qualified internal candidates apply, extend the search to external candidates, if you didn't advertise the position simultaneously. Develop your candidate pool of diverse applicants;
- Spread word-of-mouth information about the position availability in your industry and to each employee's network of friends and associates;
- Place a classified ad in newspapers with a delivery reach that will create a diverse candidate pool;
- Recruit online. Post the classified ad on jobs and newspaper-related websites including the company website;
- Post the position on professional association websites;
- Talk to university career centers;
- Contact temporary help agencies;
- Brainstorm other potential ways to locate a well-qualified pool of candidates for each position;
- Through your recruiting efforts, you've developed a pool of candidates. People are applying for your open job. Whether you have developed a candidate pool in advance of the job opening or you are searching from scratch, the development of a qualified pool of candidates is crucial;
- Send postcards or emails to each applicant to acknowledge receipt of the resume. (State that if the candidate appears to be a good match for the position, relative to your other applicants, you will contact them to schedule an interview. If not, you will keep their application/resume on file for a year in case other opportunities arise.);
- Once you have developed a number of applicants for the position, screen resumes and/or applications against the prioritized qualifications and criteria established. Note that resume cover letters matter as you screen;
- Phone screen the candidates whose credentials look like a good fit with the position. Determine candidate salary requirements, if not stated with the application, as requested.
- Schedule qualified candidates, whose salary needs you can afford, for a first interview with the hiring supervisor and an HR representative, either in-person or on the phone. In all cases, tell the candidates the timeline you anticipate the interview process will take;
- Ask the candidate to fill out your official job application, upon their arrival for the interview;
- Give the candidate a copy of the job description to review;

- Hold screening interviews during which the candidate is assessed and and has the opportunity to learn about your organization and your needs;
- Fill out the Job Candidate Evaluation Form for each candidate interviewed;
- Meet to determine which (if any) candidates to invite back for a second interview;
- Determine the appropriate people to participate in the second round of interviews. This may include potential coworkers, customers, the hiring supervisor, the hiring supervisor's manager and HR. Only include people who will impact the hiring decision.
- Schedule the additional interviews;
- Hold the second round of interviews with each interviewer clear about their role in the interview process. (Culture fit, technical qualifications, customer responsiveness and knowledge are several of the screening responsibilities you may want your interviewers to assume.);
- Candidates participate in any testing you may require for the position;
- Interviewers fill out the candidate rating form;
- Human Resources checks the finalists' (people to whom you are considering offering the position) credentials, references and other qualifying documents and statements;
- Anyone who has stated qualifications dishonestly or who fails to pass the checks is eliminated as a candidate;
- Through the entire interviewing process, HR, and managers, where desired, stay in touch with the most qualified candidates via phone and email;
- Reach consensus on whether the organization wants to select any candidate (via informal discussion, a formal discussion meeting, HR staff touching base with interviewers, candidate rating forms, and so on). If dissension exists, the supervising manager should make the final decision;
- If no candidate is superior, start again to review your candidate pool and redevelop a pool if necessary;
- HR and the hiring supervisor agree on the offer to make to the candidate, with the concurrence of the supervisor's manager and the departmental budget;
- Talk informally with the candidate about whether he or she is interested in the job at the offered salary and stated conditions. Make certain the candidate agrees that they will participate in a background check, a drug screen and sign a Non-compete Agreement or a Confidentiality Agreement, depending on the position. (This should have been signed off on the application.) If so, proceed with an offer letter. You can also make the job offer contingent on certain checks;
- If not, determine if negotiable factors exist that will bring the organization and the candidate into agreement. A reasonable negotiation is expected; a candidate that returns repeatedly to the company requesting more each time is not a candidate the company wants to hire;
- If the informal negotiation leads the organization to believe the candidate is viable, HR will prepare a written position offer letter from the supervisor that offers the position, states and formalizes the salary, reporting relationship,

supervising relationships, and any other benefits or commitments the candidate has negotiated or the company has promised;
- The offer letter, the job description and the Company Non-Compete or Confidentiality Agreement are provided to the candidate;
- The candidate signs the offer documentation to accept the job or refuses the position;
- If yes, schedule the new employee's start date;
- If no, start again to review your candidate pool and redevelop a pool if necessary.

2. Retention

Hiring an employee that is a potential fit to the needs of the organization is part of the challenge; the remaining challenge is to retain the successful employees through modern and adaptive human resources policy that stimulate Motivation, Efficiency, Performance, Flexibility and Creativity as described below:

Motivation - a means of stimulating the organization's personnel towards performance and profitability. The study of motivation in a workplace, theoretically and practically, allows to emphasize the factors of influence both internal and individual which determine the employee's motivation (needs, attitudes, interests, behaviors, system of values) and external (wage system, task assigning, work group, control and surveillance system, communication, spare time). The two types of factors interact with each other, influencing employees' behavior, their activity and thus the activity of the organization and implicitly its results. Among the instruments of influencing the motivation of the employees of the organization, for performing an activity based on efficiency criteria, the importance of the following should be stressed:
- A favorable work environment considering the fact that a person generally spends most of his active time at the work place;
- Creating possibilities for employees to participate to decision-making in a higher degree than in the productive field also considering the specificity of the consumer service tourist activity;
- Efficiently solving the employees' problems;
- Stimulating group cohesion;
- The objective appreciation of employees' performances and fixing a reward;
- Money stimulation.

A way of increasing efficiency in the organization activity is represented by teams which present a large variety of advantages: teams combine knowledge and skills which surpass those on any individual within the team; having clear objectives and established communication channels, teams are able to solve various problems in real time: they are fast, flexible and efficient because they can use expertise and means; the team offers a unique social dimension: it does not function unless it overcomes trust and personality barriers. Basically, teams allow organizations to benefit from the skills

and creativity of the entire work force instead of relying only on the specialists' ability to detect problems and offer solutions. Today, most medium and large companies are led by managerial teams. The shift of power from the individual to the team is due, more or less, to the environment specific to the activity, which sums up a set of services whose efficient quantification consists of making the client the number one priority by the complete quality of the management in order to rise above the consumers' expectations. In this regard, the following actions are recommended:

- Adopting and understanding the vision of the organization;
- Formulating an appropriate strategy to put the following motto into practice: "our client comes first", through defining the clients' demands and exigencies and defining the vision of the future;
- Defining key results;
- Explaining newly adopted values;
- Selecting and interpreting the information about performances;
- Organizing periodical audit;
- Training the employees;
- Using individual qualities;
- Creating potential advantages.

Development of personnel's creativity - a means of increasing efficiency in an organization. The management of an organization in the present must be based on the creative and initiative spirit of the employees and not on a bureaucratic approach. Human resources, which "constitute the supplementary source of survival and the main source of efficiency, effectiveness and welfare of civilization" (Petrescu I., 1995) must be stimulated from the point of view of their creative potential, because, especially in this field, material, financial and informational resources cannot be properly valued in the absence of creativity:

- Creativity refers to a person's ability and intellectual force to find new ideas, and innovation refers to putting the new ideas in practice (Snak O., 2001). Creativity can represent an important factor of increasing efficiency of a performed activity;
- Creative thinking and imagination are important elements of an SL-NSDI activity and the absence of creativity undoubtfully leads to stagnation;
- Maintaining the competition implies a continuous activity in the field of creativity and innovation, for developing new products and services, more sophisticated, more refined and more individualized. Innovative activities are not performed as campaigns and no manager can come up with a consistent support for planning precise deadlines for conceiving an innovation, as well as he cannot foresee or expect the immediate regain of the efforts invested such as energy, money and time, for experimenting and launching new products and services in the SL-NSDI Community.

In practice, one can resort to a series of measures leading to the stimulation and development of personnel's creativity within the SL-NSDI Program:

- Providing an environment favorable to creativity by: advanced personnel training, encouraging the employees to discover new solutions for problems occurred within the organization, encouraging free expression of ideas, of information exchange, stimulating the dialogue with the clients and users of SL-NSDI products and services in order to become closer to them, reducing and eliminating hierarchical distances;
- Providing favourable work conditions to potentially creative persons in order to experiment the proposed solutions;
- Diversifying the individual's integration methods within the creative group through effective participation of employees to organising their own work, arousing the employees' sense of belonging to the organization and the feeling that their dignity and professionalism are recognised within the organization, organising recreational activities outside the organization for a stronger consolidation of the group;
- Granting a high liberty of thought, action and expression by stimulating the employees' formulation of solutions;
- Forming complex creative groups;
- Educating the creative groups by stimulating the knowledge resulted from the group's creative activity, by transferring knowledge and information from the external environment;
- Turning innovation into an important element for the environment which should provide the employees with the motivation of reaching targeted objectives;
- Providing a diversified and flexible informational system;
- Extending the use of methods and techniques of stimulating creativity;
- Selecting, hiring and promoting initiative persons.

Performance Management, Development and Review (PDR) Policy. The Performance Management, Development and Review Policy is described in terms of the following variables:

a) Performance management and evaluation of staff performance may be undertaken for, but need not be limited to, the following purposes:

- To promote individual staff development and career planning strategies;
- To reward staff for excellence in performance which contributes positively to objectives specified in approved plans;
- To improve poor performance;
- To formulate and implement improvement strategies in cases where the performance of employees is below that expected from the classification level descriptions in terms of quality or extent of performance;
- To ensure fairness and due process as well as effective outcomes when dealing with demonstrated unsatisfactory performance which may lead to sanction;
- To facilitate the identification of development needs to assist employees to take responsibility for their career development;
- To provide feedback to supervisors on their performance;

- To identify possible ways of improving the way the job is structured within the work unit.

b) Managing and reviewing employee performance and fostering staff development are critical elements in the achievement of the entity priorities and its overall success. As a tool to assist in the review of performance, supervisors and employees engage in a PDR process appropriate to the employee's work responsibilities.

c) Performance Management is a joint responsibility between an employee and their supervisor. The formal PDR provides an opportunity for employees and supervisors to work together in a structured way to identify and describe work expectations, discuss learning and development needs, recognize achievements and plan for future individual and organizational growth and development.

ANNEX E - TRAINING AND CAPACITY BUILDING ACTIVITIES

The main components of the training and capacity building activity include the following:

Training and capacity building strategic plan. The training and capacity building strategic plan will develop the strategy for building the capacity of the SL-NSDI community through facilitation and coordination by the GeoCentre. The plan will propose several implementation activities as needed in order to satisfy the objectives of the tactical and long term strategy. The strategic plan will be reviewed periodically by GeoCentre.

Training implementation program for GeoCentre staff. A technical training program shall be developed and implemented during the first year of the GeoCentre operation in order to build the capacity of the recruited GeoCentre staff. This will be done after assessment of the competencies and qualifications of the existing staff and the conception of the necessary training activities that will need to be implemented in order to build the capacity of the GeoCentre staff and help them fulfill their delegated roles effectively.

Capacity building performance evaluation. Performance evaluation framework and standard operating procedures shall be developed and applied in order assess systematically the performance of the training and capacity building programs as well as the individual performance of the trained staff. The purpose is to make sure that the training programs are continuously aligned with the SL-NSDI Program business objectives and that the end users are achieving maximum benefit from the program.

Collaborative environment for community development. A coordination framework for community training and capacity building will be developed. The purpose is twofold: on one hand, create a common pool for sharing information about existing national and international programs and initiatives related to SL-NSDI/ EGIS training and capacity building at the level of educational institutions, vendors, non-governmental organizations, etc…on the other hand, benefit from an economy of scale through a central management, where appropriate, of the SL-NSDI community members participation to on-going training, capacity building programs and joint professional development activities. This can be achieved through the coordination and facilitation role of the GeoCentre.

Continuing education and professional development strategic plan. A strategic plan shall be developed that will provide the incentive and support environment for agencies staff from different disciplines and with varying experience in order to pursue advanced and/or continued education. This shall be achieved through a

spectrum of affordable continuing education and professional development programs that are offered to the staff of the stakeholder agencies.

Partnership program with educational institutions. The activity will develop a toolkit or template for a master partnership program with international and/ or local educational institutions that may include university, colleges, technical education centers, etc…In addition, partnership programs will be established and activated with national and international institutions respectively.

Virtual Training Campus. The GeoCentre shall implant the seeds of a virtual training campus and shall grow it in the future as needed. The campus will be hosted in the geospatial web portal and will allow the SL-NSDI community members to access via the internet basic training courses and interactive virtual training material through which they can gain a quick hands-on experience in the utilization of the basic services that are offered by the geospatial portal and data clearinghouse.

ANNEX F - STAFF TRAINING SELF EVALUATION GUIDE

EMPLOYEE PERFORMANCE SELF-EVALUATION FORM

Employee Name (First, MI, last):

Job Title:

Department: Division:

Period of Evaluation: From: To:

1. Overall Performance

Please use this space to describe the overall performance rating. The overall rating should be a reflection of the performance factors, behavioral traits and supervisory factors.

Unacceptable Superior

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Comments: _____

Employee's Signature: Date:

2. Performance Factors

- Knowledge, Skills, Abilities – Degree to which person exhibits required level of job knowledge and/or skills to perform the job and use of established techniques, materials, and equipment;
- Quality of Work – Assignment meet quality standards, considering accuracy, neatness, thoroughness, and adherence to standards;
- Quantity of Work – Results of efforts, demonstrating ability to manage several responsibilities simultaneously, performing work in a productive and timely manner, meeting work schedules;
- Work Habits – Displaying a positive, cooperative attitude toward work assignments and requirements, compliance with established work rules and organizational policies;

- Communication – Job related effectiveness in dealing with others, expressing ideas clearly both orally and in writing, listening well and responding appropriately.

Examples of my positive performance in this area are:

How I can improve in this area:

Rating:

___Well Above	Performance is repeatedly above expectations
___Above	Performance is sometimes above expectations
___Meets	Performance meets expectations
___Below	Performance is sometimes below expectations
___Well below	Performance is repeatedly below expectations

Goals and development needed in this area:

Goal/Objective	Complete by

3. Behavioral Traits

- Dependability – Amount of time required to understand task, monitoring projects and exercising follow-up, adhering to time frames, on time for meetings and appointments, responding appropriately to instructions and procedures;

- Cooperation – Working well with colleagues and supervisors, demonstrating consideration of others, maintaining a rapport with others, helping others willingly;
- Initiative – Seeking and assuming greater responsibility, monitoring projects independently, follow-up appropriately;
- Adaptability – Adjusting easily to changes in duties, procedures, supervisors, or work environment, accepting new ideas and approaches to work, responding appropriately to constructive criticism and to suggestions for work improvement;
- Judgment – Effectively analyzing problems, determining appropriate action for solutions, and exhibiting timely and decisive action, thinking logically;
- Attendance – Number of absences, use of annual and sick leave in accordance with policy;
- Punctuality – Work arrival and departure time in accordance with policy.

Examples of my positive performance in this area are:

How I can improve in this area:

Rating:

___Well Above	Performance is repeatedly above expectations
___Above	Performance is sometimes above expectations
___Meets	Performance meets expectations
___Below	Performance is sometimes below expectations
___Well below	Performance is repeatedly below expectations

Goals and development needed in this area:

Goal/Objective	Complete by

4. Supervisory Factors

- Leadership – Demonstrating effective supervisory abilities, gaining respect and cooperation, inspiring and motivating subordinates, directing work group towards a common goal;
- Delegation – Demonstrating ability to direct others in accomplishing work, effectively selecting and motivating staff, defining assignments, overseeing the work of subordinates;
- Planning and Organizing – Coordinating with others, establishing appropriate priorities, anticipating future needs, carrying out assignments effectively;
- Performing day-to-day administrative tasks, managing time, administering policies and implementing procedures, maintaining appropriate contact with supervisor and utilizing funds, staff or equipment;
- Personnel Management – Serving as a role model, providing guidance and opportunities to staff for their development and advancement, resolving work-related employee problems, assisting subordinates in accomplishing their work-related objectives, communicating well with subordinates in a clear, concise, accurate, and timely manner and making useful suggestions.

Examples of my positive performance in this area are:

How I can improve in this area:

Rating:

___Well Above	Performance is repeatedly above expectations
___Above	Performance is sometimes above expectations
___Meets	Performance meets expectations
___Below	Performance is sometimes below expectations
___Well below	Performance is repeatedly below expectations

Goals and development needed in this area:

Goal/Objective	Complete by

5. Job Specific Competencies

If the supervisor and staff person identified additional competencies during performance planning, those competencies should be listed below, along with the employee's self evaluation of their performance on these competencies.

1._____
(specific job-related competency)

Examples of my positive performance in this area are:

How I can improve in this area:

Rating:

___Well Above	Performance is repeatedly above expectations
___Above	Performance is sometimes above expectations
___Meets	Performance meets expectations
___Below	Performance is sometimes below expectations
___Well below	Performance is repeatedly below expectations

Goals and development needed in this area:

Goal/Objective	Complete by

6. Job Specific Competencies

If the supervisor and staff person identified additional competencies during performance planning, those competencies should be listed below, along with the employee's self evaluation of their performance on these competencies.

2._____
(specific job-related competency)

Examples of my positive performance in this area are:

How I can improve in this area:

Rating:

___Well Above	Performance is repeatedly above expectations
___Above	Performance is sometimes above expectations
___Meets	Performance meets expectations
___Below	Performance is sometimes below expectations
___Well below	Performance is repeatedly below expectations

Goals and development needed in this area:

Goal/Objective	Complete by

7. Review of Goals/Objectives for the Past Year

Where goals, objectives, projects, special assignments, etc. have been clearly established, progress of these tasks should be evaluated. List and evaluate progress made on major pre-determined goals, objectives, projects, and special assignments by marking the appropriate box. The "Comments" space may be used for satisfactory progress but must be used for unsatisfactory progress. Attach additional sheets if necessary.

1. Goal/Objective/Project/Special Assignment

____

☐ **Accomplished or Satisfactory Progress** ☐ **Unsatisfactory Progress (See "Comments" Below)**

Comments: _____

2. Goal/Objective/Project/Special Assignment

____

☐ **Accomplished or Satisfactory Progress** ☐ **Unsatisfactory Progress (See "Comments" Below)**

Comments: _____

3. Goal/Objective/Project/Special Assignment

____

☐ **Accomplished or Satisfactory Progress** ☐ **Unsatisfactory Progress (See "Comments" Below)**

Comments: _____

4. Goal/Objective/Project/Special Assignment

____

☐ **Accomplished or Satisfactory Progress** ☐ **Unsatisfactory Progress (See "Comments" Below)**

Comments: _____

ANNEX G - GEOCENTRE FACILITY

The establishment of the GeoCentre will require a permanent facility to house the group, and a variety of equipment, furniture and supporting infrastructure (computing infrastructure addressed elsewhere). This will need to be re-assessed and finalized during the final design and implementation of the initial GeoCentre. This activity addresses the steps that will be required to plan, design and implement the GeoCentre facility and associated infrastructure as described in here, outside of the computing infrastructure which is addressed elsewhere. Specific major components of this activity include:

Location. Once the permanent Sponsoring Agency for the GeoCentre has been determined, it will then be possible to determine the appropriate location for the office. The GeoCentre should be a showcase of a progressive program and facility in Sri Lanka, thus the location should reflect this prominence. The office should be in a central location, with convenient access within Sri Lanka where visitors can access and experience the GeoCentre facility and better understand the role of the SL-NSDI as a prominent and important support infrastructure for Sri Lanka. The chosen location should ideally also have provision for supporting future expansion of the GeoCentre, should this become necessary in the future.

Space programming. The space programming should make provision for effective functioning of the office, maximize collaboration and communication among GeoCentre staff, provide group work space for internal and external meetings and workshops, accommodate periodic training and seminars, and support exhibition and explanation of the SL-NSDI and its many components for the benefit of visitors.

Office design. The space program will be translated by architects and interior designers to a detailed design for the GeoCentre office. This will include a detailed space design for the entire facility and the specification of equipment, finishes and furnishings, infrastructure, and integration of the computing infrastructure components described elsewhere. The final design will be articulated in plan, profiles, sketches, specifications and bills of quantity to a level that can be used to conduct a competitive tender and/or to provide detailed instructions to the contractor and equipment suppliers.

A space program essentially describes the various components envisioned for the design of an overall physical plan. The space program can be thought of as a tool an architect can use to better understand the space requirements and relationships as they relate to the functionality of each component, which then leads to the development of the physical plan for which more detailed schematics and blueprints are prepared.

It is important to stress that the GeoCentre space be designed in a manner that provides a collaborative environment. The tasks GeoCentre staff will be engaged in will cross many sectors where open dialogue and collaboration will be necessary in order to develop effective

and compelling products. Secondly, the office design should achieve an attractive look and feel due to its high visibility. Ten components of the GeoCentre are suggested to accommodate these dynamics.

Reception Area. The reception area will be the first place viewable to staff and incoming visitors, and therefore, will deliver the first impression of the SL-NSDI GeoCentre. As such, the reception area should be designed in an attractive manner with adequate lighting to convey a welcoming feeling, and demonstrate the SL-NSDI GeoCentre as a functional, well organized office. In addition, the reception area should also accommodate wall space for laying out a storyboard discussion that describes the SL-NSDI mission. In other words, this area can be used to display high-quality posters and images of various maps and graphical outputs created by the GeoCentre and the general SL-NSDI community.

Executive Office. Because the GeoCentre will have interaction with high-level officials, it will be necessary for the Geographic Information Officer (GIO) to have an office that accommodates any necessary private discussions. This office space should be designed such that the GIO has the functional space necessary to complete his business activities, while also accommodating for more casual meeting space with visitors and other staff.

Personal Workspaces. There are basically two perspectives when designing workspaces. Those that are enclosed and provide a more private environment, but offer less room for collaboration, and those that are more open, offer less privacy, but offer more collaboration. It is recommended that a combination of both approaches be adopted. It is important for staff to feel that they have a certain level of privacy, however, the GeoCentre environment should be one that is highly dynamic and collaborative, which stems from the need to cover a wide spectrum of topics and issues. Therefore, it is recommended that the personal "cube" space format not be utilized, but rather personal spaces within an open room that have low walls or no walls at all, so that staff members can still see and talk to one another while still having a personal space they can call their own. Adequate lighting should be provided with the necessary office furniture needed to conduct regular business activities.

Open Space Work Room. The open space work room is conceived to be a highly dynamic work space where GeoCentre staff and visitors can collaborate and openly discuss various topics and issues. This is an area that is supposed to foster ideas through useful tools such as whiteboards, large desk space to spread out posters, maps and other graphics, projectors for visualizing presentations, and plotters/printers to print out and evaluate completed products. In addition, this room should also have adequate wall space for hanging up posters, maps and other graphics, including adequate shelving space for storing supplies, files, and any necessary manuals.

Library. It would be ideal to also incorporate a library into the GeoCentre facility. This will especially be helpful due to the many sectors the GeoCentre will be engaged with. Therefore, the library could host a diverse selection of information related to cross-sectoral perspectives on GIS and geospatial sciences and technology in all media types

useful to all GeoCentre staff and incoming visitors. The library should provide adequate lighting, sitting space, be organized according to library standards, and be quiet such that one can use this space to "escape" and learn from the materials provided. It would also be beneficial to host one or more computers in this area such that library visitors can access the internet and work on other reports, documents, maps, etc. for which the library materials will be useful. This space should also accommodate.

Multi-purpose Room. This room can serve multiple purposes such as an interactive training room and media center for presentations, simulations and dynamic visualizations. The difference between the multi-purpose room and the open space work room is that the former offers a higher level of technology for more dynamic interactions and can be used for formal venues such as prototype demonstrations, high-level executive presentations and formal training classes.

Formal Conference Room. It is understood that the GeoCentre will have several options for informal meeting spaces throughout the facility. However, a more formal conference room will be required for high-level meetings. This conference room should also provide the basic technology needed for giving presentations, while more sophisticated, dynamic presentations can be given in the Multi-purpose Room.

Kitchenettes. Productive work requires a well-fed staff. Therefore, it is suggested that the GeoCentre accommodate a kitchenette, essentially a smaller kitchen that allows for refrigerating food and drinks, provides a sink for washing dishes, and cabinet space for storing food and kitchen utensils. In addition, this space can also be used to accommodate the storing of items necessary to cater large meetings or special functions. An option would be to also include an eating area as part of this component.

The facility shall be characterized by the following:

- Be fully furnished, equipped with CATV infrastructure and central air conditioning distributed control thermostats.
- The offices shall have enough physical space and closets for documents storage
- A space shall be dedicated for editing and publishing room i.e. it shall accommodate at least two plotters, one scanner, one digitizer, and three workstations work desks

ANNEX H - GENERAL ADMINISTRATION ACTIVITIES

The general administration activities are described below:

General Administrative Support. The GeoCentre daily administration is handled by a Senior Office Manager and Secretariat that manages several administrative activities related to the GeoCentre operation:

- Attend meetings with the SEC and Technical Committee and be responsible for preparation, coordination of review and distribution of minutes of meetings to the various stakeholders;
- Schedule and follow-up meetings of the GIO and the Technical Manager;
- Chair quality management initiatives in the GeoCentre
- Maintain personnel files in coordination with the Personnel Affairs

Financial Management Support. The GeoCentre will manage its own revenues and expenditures. It will secure equipment and other resources. Basic activities carried out in this area may include:

- Develop GeoCentre budget
- Monitor revenues and expenses
- Arrange for periodic financial audits

Supplies/ General Services. Running the GeoCentre requires a wide range of stationery supplies, small equipment, and other incidental supplies. There are also specialized general services such as printing and copying that may be outsourced. The process for procurement and management of supply stores and the provision of fast and effective general services is important to maintaining staff productivity and efficient public services. Basic activities that often are carried out within this functional area include the following:

- Administer supply request and procurement;
- Maintain stores;
- Provide or arrange for general services (reproductions, fax, mailing, etc.).

Monitoring & Reporting. The monitoring and reporting function is an important activity in the GeoCentre operation because it allows monitoring through systematic measurement and standard reporting the evolution of the SL-NSDI program. This activity consists of the following:

- Prepare and submit reports to the GIO and Technical Manager by the GeoCentre staff and supervisors summarizing their routine activities and projections on monthly basis;
- Consolidate the input received from the Working Groups and interactions taking place with the SL-NSDI Community and present an integrated view of the work-in-progress including issues, opportunities and constraints;
- Prepare and submit quarterly reports by the GIO and Technical Manager to the SL-NSDI Steering Committees;

- Assess the deviations and/or compliances to the strategic plan and reflect the outcome of the assessment in the periodical reporting;
- Call out any issues related to the performance of the member agencies in relation to their service level agreements commitments or to the evolution of the SL-NSDI implementation projects according to the established rules and benchmarks;
- Propose any additions or enhancements to the SL-NSDI Program implementation based on an assessment of the internal and external environments and the evolution in maturity of the SL-NSDI Community.

Office Administration. One of the most important assets of the GeoCentre is its people. The recruitment, hiring, management, reward, and retention and professional development of the organization's personnel are critical to the effective functioning of the organization. Effective personnel management involves ensuring that once sound business practices are defined that qualified people are hired or trained to carry out those jobs, and the programs are in place to provide these people with a healthy and productive work environment, competitive salary and other benefits, professional development opportunities and merit based salary and position enhancement. Typical activities in this functional area include:

- Manage staff recruitment and retention;
- Manage personnel records;
- Conduct performance reviews and provide systematic, merit-based salary and position advancements;
- Coordinate staff training and professional development.

ANNEX I - SL-NSDI AND GEOCENTRE PROJECTS DEVELOPMENT

SL-NSDI Projects Development

Scope and Application

All significant SL-NSDI development proposals will need to be evaluated to determine potential impact to the community, and based on this determination of the appropriate measures to be taken in how the project or program is structured and run. The following presents a basic procedure by which information management related projects or programs are introduced and deliberated to determine the breadth of interest and potential impact of each. This deliberation will determine the range of stakeholders that need to be involved, and level of bureaucratic structure and oversight that needs to be applied to each initiative.

Summary of Method

The implementation steps have been adopted for use by the SL-NSDI from those used in ISO processes. This general approach is further illustrated in figure 3.

Proposal Stage (steps 1-3). The Proposal Stage defines the needs for and benefits of a standard. At the end of the Proposal Stage the SL-NSDI Community recognizes the proposal as a project and adds it to the projects' register, but work or funding for the project may not yet be identified.

Project Initiation Stage (step 4). The Project Initiation Stage defines the funding and administration for the SL-NSDI development project. The development methodology, work groups and members, and development schedule are documented. At the end of the Project Initiation Stage work begins on project development.

Project Development Stage (step 5-6). The project development stage receives comments and input from as many constituent groups as possible. At the end of this stage, the project outcome is ready for public review.

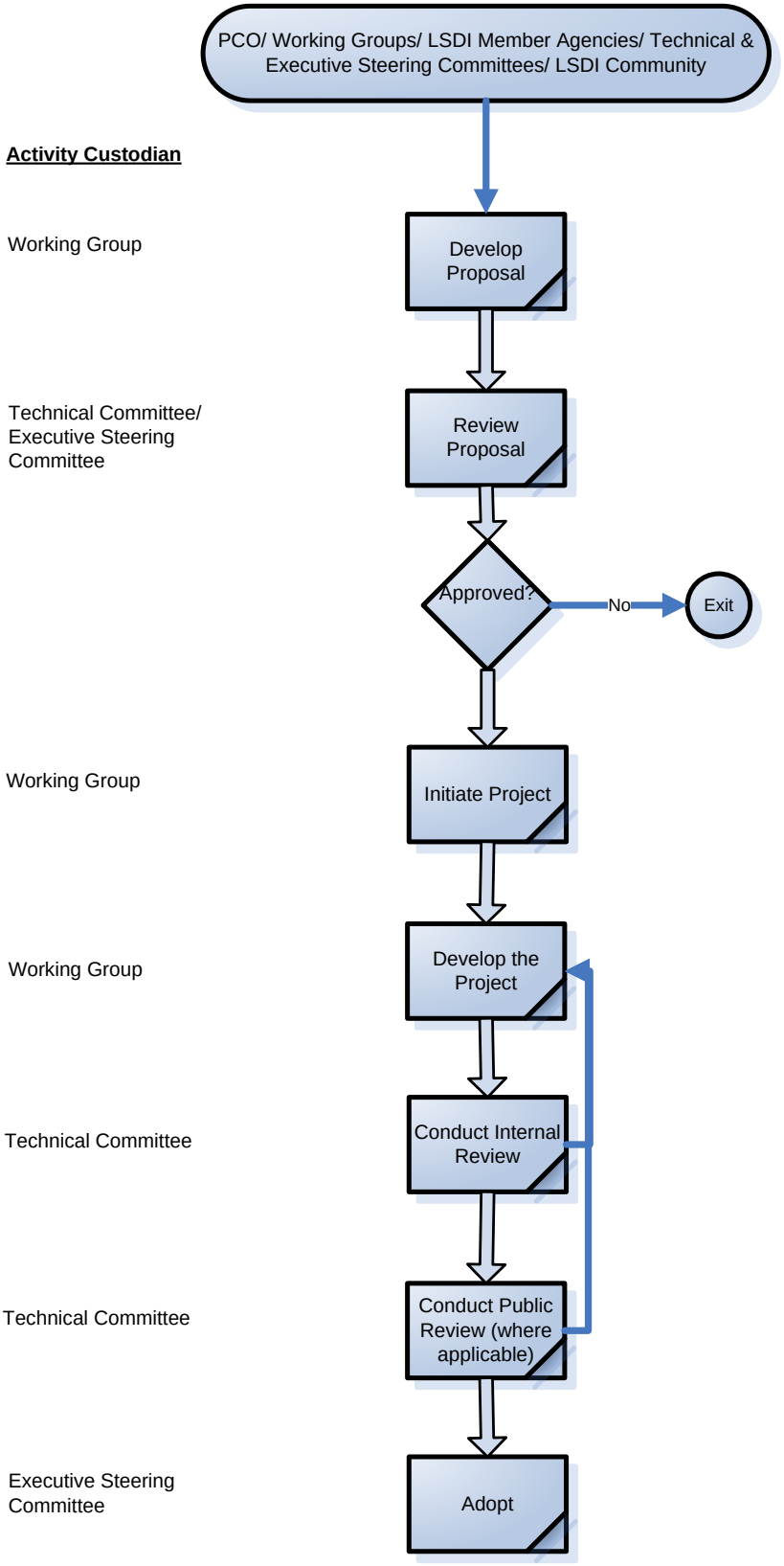
Review Stage (steps 7-8). The first portion of the review stage is for public comment and official public review. The latter portion of this stage is for internal SL-NSDI format and integration review. At the end of this stage the project is ready for SL-NSDI approval.

Final Adoption Stage (step 9). The Final Adoption Stage is where the project outcome becomes an officially recognized SL-NSDI development.

In each step, an identified group has responsibility for the project; this is the project custodian. The project custodian is responsible for determining when the project is ready to advance to the

next step. Each step is described below with a description of the activities and custodian for the standard. A diagram of the steps follows the descriptions.

Figure 9 SL-NSDI Projects Development Process Flowchart



Definitions

SL-NSDI Development Proposals. The SL-NSDI development proposals are triggered by a request or proposal by any member of the SL-NSDI Community for an SL-NSDI related development. The proposal could be related to metadata standard development, data standards development or any implementation project related to the SL-NSDI Program. The request may be initiated by the Executive Committee, Technical Committee, GeoCentre, Sub-Committees and Working Groups. The GeoCentre, will log the proposal and track its evolution in a projects tracking data base until its completion or closure.

SL-NSDI Project. As described in the implementation steps of the this SOP, an SL-NSDI project is a requirement that has been recognized by the SL-NSDI Community as important or critical and may thus be prioritized for implementation depending on the availability of budget and resources. It is important to highlight the fact that the GeoCentre, as the technical arm of the SL-NSDI Technical Committee, has the capability through its existing resources and flexibility of mobilizing domain experts through hiring of consultants, has a freedom of maneuver for supporting the SL-NSDI Community through the processing of Requests for Projects (RFPs) and Requests for Information (RFIs) up to a certain threshold as described in the next SOP. Those support activities and/or services may include special or adhoc projects, consulting services, requests for information, data products and services that require limited resources. The resources requirements to handle the above services are reflected in the yearly operational budget of the GeoCentre. When the projects become above a certain threshold as identified in the RFI/RFP SOP, then they follow-up the same development process outlined in the current SOP.

Working Draft Deliverables. The working draft project deliverables refer here to the outcome activities that will result from a specific project. In the case of standards development, this is referring to draft standards whereas in the case of data projects, the outcome is FGDS digital data, data maintenance procedures, configuration management procedures, etc…

Cautions

SL-NSDI FGDS data development projects shall be supplemented by data maintenance procedures that are put in place by the custodian agencies in order to ensure that the data updates are maintained and that the data quality will not degrade with time.

Interferences

SL-NSDI development projects may have dependencies and overlaps among each other that may necessitate close collaboration and cooperation among the various players in order to avoid negative interferences among them.

Personnel Qualifications

The following personnel qualifications have been identified to be needed:

Project Development Working Group. As described in the project implementation steps, a project is usually assigned by the Technical Committee to the Working Group that is in charge of a particular area of interest. However, the Working Group my split into sub-groups who conduct different missions or activities. The project in question may be assigned to one of the sub-working groups that is alternatively labeled here project development working group.

Project Manager. The project manager is usually designated by the Working Group in charge of the particular area of interest. The project manager could be the chair of the WG. Alternatively, the project manager could be selected as a member from the WG and/or the steward agency of that particular area of interest such as FGDS data custodian. Nevertheless, the WG is recognized to be the project custodian and should exercise its technical and executive oversight on the project development and report the outcome to the SL-NSDI Technical Committee (TC).

Project Team Members. Similarly to the project manager, the project team members are selected preferably from within the Working Group/ steward agency circle taking into consideration their involvement and experience in the subject matter. The project team members may be supported by local and/ or international consultants as deemed necessary by the project manager in consultation with the WG chair.

Contractors/ Consultants. Consultants and contractors may be hired on an as-need basis in order to support and execute the project implementation respectively.

GeoCentre/ Technical Committee Secretariat. The TC secretariat and/or the GeoCentre shall be in a vantage point in terms of capturing, tracking and reporting all developments taking place in relation to the SL-NSDI program. They shall use the necessary tools and methods to do so such as a Projects Tracking and Configuration Management database that is used by the GeoCentre.

Equipment & Supplies

The following equipment and/ or supplies have been identified as necessary in order to conduct the SOP instructions effectively:

Configuration Management System. The configuration management process is inherent to the GeoCentre daily operation. This applies to all components of system design; in particular the SL-NSDI implementation projects that have impact on the SL-NSDI Program evolution and performance.

GeoCentre Projects Tracking Database. The GeoCentre shall develop, deploy and maintain an application that is integrated with the configuration management system and the help desk support system through which all projects are logged and tracked since inception until completion or cancellation. The application includes also advanced reporting capabilities and is spatially enabled via a link to the geospatial portal metadata which permits to visualize the geographical extent of a data project, for example, where applicable.

Official Notification Framework. The SL-NSDI Community including Steering Committees, GeoCentre and Working Groups shall utilize a common communication platform for formal and non-formal exchange of information related to SL-NSDI developments. This may include an e-mail and correspondence exchange mechanism such as SL-NSDI exchange server through which communication takes place, correspondence, notifications and documents are archived.

Projects Reporting Templates. The SL-NSDI Community shall develop and adopt normalized templates for reporting working drafts and work-in-progress related to SL-NSDI projects developments as well as minutes of meetings, working plans, annual reports, etc…

SL-NSDI e-community environment. The SL-NSDI community shall develop electronic forums for exchanging of ideas, knowledge and experience related to the SL-NSDI development initiatives. Those forums that can be organized in the form of chat rooms, e-conferences and webinars, blobs, etc…could be hosted on the SL-NSDI Web Portal and can be made accessible by all member agencies and working groups.

Procedures

The following implementation stages are described in detail.

Proposal Stage

Step 1 Develop Proposal. A new Sri Lanka Spatial Data Infrastructure (SL-NSDI) project proposal is submitted. The proposal identifies the need, the scope of the project, the benefits, the consequences of not implementing, and a date by which the project completion is needed. The proposal may be for development of a new standard, adaptation or adoption of an existing standard or the implementation of an SL-NSDI activity such as FGDS data developments or agency capacity building strengthening and community developments. The proposal may suggest a target authorizing body outside of the Community, such as the National Institute for Standards (NIS), or International Standards Organization (ISO). A proposal may be made by any SL-NSDI subcommittee or working group, any member agency including local, national or regional government agencies. Project proposals will also be considered from non-government groups such as

professional societies, private companies, and consortia which participate with the SL-NSDI Community in the development of the SL-NSDI.

Custodian: Working Group

Step 2 Review Proposal. The TC reviews and evaluates the project proposal using pre-defined criteria to be developed by the TC. If a proposal is approved, the TC will assign the approved project to the appropriate Working Groups and the TC secretariat/ GeoCentre will register the proposal as an SL-NSDI approved project. When no appropriate group exists, the TC will identify the need for the creation of a new subcommittee or working group. If disapproved, the proposal is returned to the proposing entity with a statement outlining the objections to the proposal. When appropriate, the TC will suggest changes to the proposal that would make it acceptable. TC decisions may be appealed to the ESC. The proposed projects will be thoroughly assessed and documented in terms of key information, including, but not limited to:

- Proposed project/program description;
- Business impact, benefits, and projected lifecycle costs;
- Involved or affected stakeholders;
- Potential relationships and linkages to existing systems and existing or planned projects and programs;
- Define whether to be conducted in-house or outsourced;
- Proposed implementation approach and schedule;
- Issues, alternatives, opportunities, constraints and risks.

Custodian: Technical Committee

Step 3 Ad Hoc or Emergency Requests. It is recognized that ad hoc and emergency requests cannot be totally avoided, and that it will be desirable to be ready to handle special cases. Ad hoc or emergency requests may be submitted directly to the ESC for immediate consideration outside the systematic submittal proposal and configuration management process, if they are urgent or believed to be highly specialized and of interest only to the proposing party. The same basic information listed above will be required as part of this application, but in an abbreviated form that is sufficient for others to understand the purpose, scope and magnitude of the proposed project or program. This information should be logged to the SL-NSDI developments project tracking system and routed for preliminary assessment. The assigned Working Group will support the ESC in carrying out such rapid assessment.

Custodian: ESC

Project Initiation Stage

Step 4 Set Up Project. An SL-NSDI Subcommittee or Working Group is assigned by the ESC to lead the project implementation. A project leader is assigned for each project.

This may be, but is not necessarily, the group leader (for example, a Subcommittee Chair). A subgroup of the Subcommittee or Working Group may be formed. A project editor should also be assigned for each project. The editor maintains all documentation and makes all official revisions to drafts of the project deliverables.

Custodian: SL-NSDI Subcommittee or Working Group.

Project Development Stage

Step 5 Produce Project Working Draft Deliverables. The project development Working Group proceeds with project development after determining a development approach. The group identifies existing related projects and projects development activities and assesses their relevance to the project in accordance. Depending on the scope and impact of any approved project there will be an appropriate level of oversight established to ensure that the project both accomplishes user needs and aligns with community interests through the entire project lifecycle.

Each significant project must be planned in detail, managed and controlled by the Project Manager. Project management involves balancing the scope of the work to be performed, the timeframe in which the project is to be accomplished, the resources available, and the overall quality and impact of the project outcomes. Project control involves comparing actual progress with the plan and taking corrective action when the two do not correspond. The project plan will be prepared by the Project Manager and will detail all the work that will need to be done. The plan also lists the individuals in the SL-NSDI Community whose skills are needed to work on the project, a work breakdown chart for the project, and a projected time line with milestones. The Project Manager may find it necessary to revise the plan during the process due to additional user input or discovery of new information. However, before beginning the development step, a plan must be laid out and users kept informed of changes, especially time line changes. The Project Manager should keep the Working Group informed of changes to the project plan as they occur. The WG, in turn, informs the TC if there are changes in the time line or other significant events.

In the case of standards, adoption of existing specifications, whether those be international, national, agency, or de facto standards should be considered first. If an existing standard cannot be adopted, the group may consider adapting an existing standard, which is using an existing standard as the basis for a new standard. When adoption or adaptation of existing standards is inappropriate or insufficient, the group may begin development of a new standard. The project group may involve representatives outside the SL-NSDI Community.

Project Team Composition and Responsibilities. The Project Team will vary greatly depending upon the scope and requirements of the project. Some projects will be heavily dependent upon only one technical expert as the source for the entire project. Others may depend upon team members from throughout the community.

Inclusion in a Project Team is not dependent upon the agency to which the member is assigned, but is dependent upon his technical skills. The appointed Project Manager leads the project, assigning tasks to team members and completing specific technical tasks. The Project Manager must provide input on each individual to the WG and TC.

***Project Members*.** Project members are selected by the WG from the pool of available steward agency personnel based on the skills required for completing a project. Project Team Members will be given assignments and due dates based on the project structure. The Project Team Member will update the Project Manager at milestones and upon completion of a task. All documentation that the Project Team Member is responsible for will be turned over to the Project Manager.

***Project Manager*.** The Project Manager is assigned by the TC based on the recommendation of the WG. Planning, monitoring, and managing the project steps defined above are the Project Manager's primary responsibilities. The Project Manager must be flexible and adjust the project plan when required, informing the WG when significant milestones will not be met, and the WG will notify the TC where such delays may have some impact to the organization.

***Project Management Coordination*.** The TC will track the progress of all projects and provide technical consulting as necessary. Any significant delays and problems encountered in any phase of the project must be brought to the attention of the ESC.

The project manager for any SL-NSDI developments project will be responsible for preparing and posting monthly status reports, as required by the project plan. This information will be posted to the GeoCentre SL-NSDI developments Project Tracking System for common reference. Each status report will at a minimum address the following:

- General description of project progress and status;
- Larger projects will include summary of status by major component;
- Project schedule, including original schedule and any significant deviations;
- Identification of any issues that have arisen, and short description of how they are being resolved.

Custodian: Project Development Working Group.

Step 6 Review Working Draft Deliverables -The project development Working Group submits the working draft deliverables for pre-public review by the entities that would be affected by the working draft, but at this stage the review is targeted and does not constitute an open, public review of the working draft. The WG coordinates the review as necessary. The working draft is revised as needed following SL-NSDI standards guidelines and best practices. After this step, the working draft becomes a TC Draft.

Custodian: SL-NSDI Subcommittee or Working Group.

Review Stage

Step 7 Review and Evaluate. The TC evaluates the TC Draft and approves it for further processing following the SL-NSDI Standards guidelines and criteria. If approved, the TC sends the TC Draft and a recommendation to advance the draft to public comment to the ESC where necessary e.g. in the case of standards development. If not approved, the TC Draft is returned to the Standard Development Group (Step 5). The final accepted program for the implementation of any significant SL-NSDI developments project/program will include the identification of a peer review panel assigned by the TC, and schedule for periodic project review and assessment. The members of the panel, and the scope and scheduling of such review will be dependent upon the specific project or program, and will be identified by the TC, in consultation with the WG. In general, the review will address the following topics:

Project review and assessment

- Project definition and formation;
- System development methodology;
- Project management methodology;
- Interactions and coordination with project stakeholders;
- Linkages to other SL-NSDI systems and/or projects (current or potential);
- Current status and expected outcomes;
- Plans for project follow-on;

Committee assessment and recommendation

- Recommendations for project refinements and follow-on plans;
- Recommendations for refinements to the project review panel;

Revision of project and project plans

- Refinement of current project plans and future follow-on;
- Review by peer review group;
- Technical Committee briefing;
- Submission of project refinement documentation for use in the SL-NSDI Configuration Management program.

Results from such review and assessment will be recorded to the GeoCentre SL-NSDI developments project tracking system. The issues that arise during this review effort that cannot be resolved within the project will be referred back to the ESC for further deliberation.

Custodian: Technical Committee.

Step 8 Coordinate Public Review (where applicable). The TC secretariat announces and coordinates a public review of the Proposed SL-NSDI project. Coordinating Public Review encompasses making public announcements, handling distribution, and receiving public comments. At a minimum, the completed project is announced in the government Register with

a request for comments. The announcement may also be published in professional journals, in trade magazines, and on the Internet to obtain the widest possible public exposure. The TC Secretariat, the responsible Subcommittee or Working Group, may conduct presentations about the standard at public meetings and conferences, including those involving state and local governments, and the private sector. The WG reviews and coordinates the feedback from the public, resolves all comments, determines what revisions are to be made and prepares a public response document. After satisfactory results with the public response, the draft is submitted again to the TC who in turn submits the draft to the ESC for final approval.

Custodian: Technical Committee.

Final Adoption Stage

Step 9 Act on the recommendations. The EC reviews the recommendation of the TC. If the recommendation of the TC is approved, the project final acceptance is signed by the SL-NSDI Program Chair. Approved SL-NSDI projects are submitted for final publication and public release. If not approved, the recommendation is returned to the TC.

Custodian: EC.

Quality Control & Quality Assurance

The SL-NSDI projects development and review process including multi-stage review and opening for public consultation provides a self-regulated quality control environment.

Reference

The following websites have relevant reference related to SL-NSDI projects development framework:

- FGDC
- INSPIRE
- ISO

GeoCentre Project Management

Scope and Application

The GeoCentre project management SOP refers specifically to the SL-NSDI projects that are managed by the GeoCentre and focuses on the resource management perspective and internal organization by the GeoCentre for handling projects of various scope and complexity.

Summary of Method

Several categories of projects and activities have been identified in the current SOP; they include:

- Projects and Adhoc services
- Operation services
- Administrative services

The emphasis is given to the projects and adhoc services that are organized in their turn into:

- Projects
- Special Projects
- Consulting
- Request for Information (RFI)

The nuances among the projects categories are described under the procedure section and are based on the amount of resources needed combined by the type of the activity.

The Definitions

Not Applicable.

Cautions

The GeoCentre project management SOP helps the GeoCentre create a mechanism through which community support services are provisioned in an organized and effective way. This will help to optimize the allocation of resources as well as to leverage the experience and lessons learned from historical and on-going projects. This can be achieved through integration with the GeoCentre configuration management environment.

Interferences

The GeoCentre staff are subject daily to interferences from the SL-NSDI Community through sudden requests for services with an urgent status portrayal by the requester who may be a VIP, agency executive, other prominent members of the SL-NSDI community as well as normal users and beneficiaries of the SL-NSDI platform. Unless the RFI/ RFP process is organized properly, this may cause interruption to the daily activities of the GeoCentre staff and deterioration to their activity performance.

Personnel Qualifications

The following roles and profiles are involved in the GeoCentre projects management SOP:

> ***GeoCentre Consultants.*** The GeoCentre consultants are hired on occasional basis by the GeoCentre in order to support the GeoCentre staff in conducting their activities. This may include the hiring of resources to supplement coordination and support capabilities by the

GeoCentre for member agencies such as FGDS coordinators, GIS analysts, etc…or to provide specific services as instigated by the RFI/RFPs.

GeoCentre staff. The GeoCentre staff could be any employee of the GeoCentre who is delegated by the GIO to perform a specific role related to GeoCentre project management implementations. This is done in consultation with the direct supervisor of the staff where applicable.

Procedures

There is a limit to the amount and type of work that can be accomplished by GeoCentre SL-NSDI developments staff in the various Departments and units. Formalized procedures are defined to use finite resources and targeted outsourcing to get the most good for GeoCentre as a whole, and to leverage outsource contractor support wherever it makes sense to do so. The combination of formalized procedures, a freer flow of information and ideas, and the matrix organization approach will enable GeoCentre to better prioritize work and develop a unified and standardized approach to providing SL-NSDI development services.

The GeoCentre classifies its SL-NSDI development activities into three primary categories of work for the purposes of work planning and manpower allocation, including a) projects and ad hoc services, b) operational services, and c) administrative tasks. Any one the GeoCentre departments can provide all classes of service, according to the roles and responsibilities as defined in its mandate. The following subsections address the work planning and manpower allocation issues and procedures.

Projects and Ad Hoc Services

1. Projects

Projects are any significant, extended package of work (requiring more than 80 hours of concentrated effort), require significant effort on the part of GeoCentre staff, and may require other information technology resources, such as the purchase of new software, hardware, etc. Projects are managed by a designated Project Manager and are structured by the project management process outlined in this document. Projects can be initiated by requirements from within GeoCentre. Managing projects is described in more detail elsewhere.

1. Special projects

Special projects include unplanned requests from GeoCentre upper management, the Executive Committees, or other VIP's. These requests are very important, very visible, and often very disruptive of other day-to-day activities that GeoCentre staff need to carry out. A service bureau function will coordinate and handle most of these sorts of requests. On the other hand, manpower planning should always assume a certain allocation of time on a monthly basis that

will need to be expended by the GeoCentre staff to carry out special project work, based on roles and responsibilities and historical requests to the Office.

2. Consulting

Consulting tasks are ad hoc user requests that occur when a user problem is referred to a GeoCentre staff. These are more informal and unstructured than formal projects, however, consultation requests received by GeoCentre staff are logged with pertinent information and retained for future reference. Most consulting inquiries should be resolved at the Help Desk. The person assigned the task will resolve the consulting issue or refer it to an appropriate functional expert. If the consultant is working on a higher priority task, he will document the problem (letting the caller know when to expect a reply), research it and reply later. The Service Bureau must be kept abreast of all consulting requests that require more than 40 hours to resolve.

3. Request-for-information (RFI)

Requests for information for SL-NSDI developments may come from any department within the GeoCentre, higher authorities, other agencies, institutions, and the public. A 'Request for Information' (RFI) service provides members of the SL-NSDI stakeholder community the ability to request products, information, or services from the GeoCentre. This centralizes and simplifies stakeholder information requests through a centralized system, so that requests can be tracked, assigned, and managed. Importantly, this also provides the GeoCentre with the capacity to evaluate frequent requests for common needs. As a result, future requestors can receive products similar to their needs, reducing the need to generate custom products. The basic process for managing any given RFI includes the following:

- Request received by the GeoCentre by phone, email, personal request, or entry to the GeoCentre web portal;
- Request reviewed, logged to system, and routed to appropriate department;
- SL-NSDI Service Bureau review request and respond directly if requires less than 4 hours. In some cases, this may require additional contact with the requestor to clarify what is needed;
- If more than 4 hours, notify department head for approval;
- If more than 4 hours but less than 80 hours, initiate an SL-NSDI Project in the project tracking system, without TC oversight;
- If greater than 80 hours, initiate an SL-NSDI emergency project request through procedures described previously.

Operational Services

1. Operations and Maintenance

Operations and Maintenance includes recurring tasks or trouble-shooting related to the reliability and availability of information resources. These tasks include all information

technology resources that are available to the GeoCentre staff such as the central facility, the data networks, and related software systems.

2. Help Desk

Via email or phone, GeoCentre internal consultants staff the center to answer general or routine questions and resolve minor problems. Complex problems requiring lengthy solutions will be referred to the appropriate staff member. The rule-of-thumb is that routine consulting involves an issue that can be resolved within four hours. By directing consulting questions to a central point within GeoCentre, users have a quicker response and each user receives the same solution. This also helps to reduce work interruptions and increase the productivity of GeoCentre's staff work on assigned projects.

Administrative

Administrative tasks include tasks that are required for personnel administration (evaluations and awards), or certain types of safety or supervisory training. Not all administrative tasks are specifically related to the business of SL-NSDI developments, but are required administrative tasks and must be accomplished in a timely manner to ensure that mandatory guidelines are met. Many administrative tasks are recurring, so they can be fit into workforce loading plans.

Equipment & Supplies

The following equipment is identified to be needed or have dependency with the GeoCentre project management SOP:

> ***Configuration Management System.*** The configuration management process is inherent to the GeoCentre daily operation. This applies to all components of system design; in particular the SL-NSDI implementation projects that have impact on the SL-NSDI Program evolution and performance.
>
> ***GeoCentre Projects Tracking Database.*** The GeoCentre shall develop, deploy and maintain an application that is integrated with the configuration management system and the help desk support system through which all projects are logged and tracked since inception until completion or cancellation. The application includes also advanced reporting capabilities and is spatially enabled via a link to the geospatial portal metadata which permits to visualize the geographical extent of a data project, for example, where applicable.
>
> ***Helpdesk.*** The helpdesk will be developed and deployed by the GeoCentre in such a way that it is integrated with the day-to-day operation of the GeoCentre in relation to configuration management, project tracking and reporting. In this way, management can check, at any one time, the status or work-in-progress in any one of the implementation projects.

Quality Control & Quality Assurance

In order to ensure effective performance of the GeoCentre Projects Management SOP, an internal periodical review shall be performed by the GeoCentre management in order to check the applicability of the SOP and its achievement of its organizational and institutional objectives. This can be done on a semi-annual basis through the configuration management plan internal audit or quality management reviews.

Reference

The GeoCentre project management SOP shall be reflected in the future quality management operating procedures in the GeoCentre. In addition, the GeoCentre project management SOP is recognized as a complement of the SL-NSDI projects development process SOP that is described in the previous section.

ANNEX J - STANDARD SLA TEMPLATE AND MASTER SERVICE LEVEL AGREEMENT

The standard SLA template includes the following chapters and sub-chapters:

Introduction

- Purpose & Objectives
- Parties to the Agreement
- Commencement Date
- Duration of the Agreement
- Non-Exclusive Agreement
- Definitions

Scope of Work

- Standard Services
- Non-Standard Services
- Service Availability
- Place of Service Delivery
- Changes to Services
- Client Delays

Performance, Tracking and Reporting

- Key Personnel Changes
- How Each Individual Service Will Be Monitored
- Benchmarks, Targets and Metrics To Be Utilized
- Service Level Reporting
- Service Review Meetings

Problem Management

- Support and Service Desk Services
- Problem Definition

Compensation

- Professional Fees
- Invoices
- Payment Terms
- Taxes
- Interests For Late Payment

Customer Duties and Responsibilities

- Processing and Authorization of Invoices
- Client Personnel, Facilities and Resources
- Training on Specialized Equipment
- Approvals and Information

Warranties & Remedies

- Quality of Service
- Indemnification
- Third Party Claims
- Remedies for Breaches
- Exclusions
- Force Majeur

Security

- Physical Access
- Logical Access
- Compliant with Client Security Policies
- Information and Data Security Measures
- Disaster Recovery
- Encryption

Intellectual Property Rights & Confidential Information

- Intellectual Property Rights
- Confidentiality
- Court Orders
- Destruction of Data and Records

Legal Compliance and Resolution of Disputes

- Governing Law
- Export Control
- Information Resolution
- Arbitration
- Limitation of Action
- Duration of Liability

Termination

- Termination After Initial Term
- Termination For Convenience

- Termination for Cause
- Payment of Termination

General

- Notices
- Standard of Care
- Assignment
- Entire Agreement
- Severability
- Changes to the Agreement
- Non-Solicitation
- Exhibits

Signatures

Master Service Level Agreement (MSLA)

1 Introduction

1.1 Purpose & Objectives

The purpose of this Master SLA is to describe the general agreements that govern the relationship between the GeoCentre and the member agencies of the SL-NSDI community.

1.2 Parties to the Agreement

Party 1: GeoCentre
Party 2: Member Government Entity

Beneficiary: Client i.e. member government entities or third parties benefiting from the AD-SL-NSDI data services offered by the member government entity either directly or via the GeoCentre

1.3 Commencement Date

The commencement date is reflected in the Addendum SLA that is signed between the GeoCentre and the individual Entity.

1.4 Duration of the Agreement

The duration of the agreement is reflected in the Addendum SLA that is signed between the GeoCentre and the individual Entity.

1.5 Non-Exclusive Agreement

This Master SLA is by default non-exclusive. Any specifics in the relation between the GeoCentre and the individual Entity are reflected in the Addendum SLA.

1.6 Definitions

1 "Metadata" means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them.

2 "SL-NSDI member Entity" refers to the government Entity that is a member and a key stakeholder of the SL-NSDI community.

3 "Third party" refers to any Entity, organization or institution that is not part of the SL-NSDI community such private sector, educational institutions, non-governmental organizations, etc…

4 "Interoperability" of data sets refers to the adoption of common data structure and unique identification codes for spatial objects by various data sources that are created for different purpose. This facilitates cross-referencing information for the same physical objects with spatial representation.

5 "Spatial data and related services" refer to the SL-NSDI FGDS data sets that are captured, maintained and disseminated by the SL-NSDI member Entity as a steward and custodian of the data topics under consideration.

2 Scope of Work

2.1 Standard Services

The member Entities of the SL-NSDI community shall agree to provide the following services:

- Metadata
- Spatial Data Sharing
- Spatial Data Services

The scope of the spatial data sharing services that are offered by an SL-NSDI member Entity is supplemented by requirements that are described in the following documents or references:

- Addendum SLA
- SL-NSDI Projects Development SOP
- FGDS Data Maintenance SOP

2.1.1 Metadata

1 SL-NSDI member Entities shall ensure that metadata are created for the spatial data sets corresponding to the themes that are under their custodianship (refer to attachment) and that those metadata are kept up to date.

2 Metadata shall include information on the following:

a) Conditions applying to access to, and use of spatial data sets and, where applicable, corresponding fees;
b) The quality of spatial data, including whether they are validated and the quality measures, specifications and procedures that were adopted for data validation;
c) The custodian Entities i.e. responsible for establishment, management, maintenance and distribution of spatial data sets and services including contact information;
d) Limitations on public access and the reasons for such limitations in accordance with government laws;

3 Entities shall take the necessary measures to ensure that metadata are complete and of a quality sufficient to fulfill the purpose set out in the metadata definition

2.1.2 Spatial Data Sharing

1 Implementation of spatial data sets and related services shall be based on the definition and classification that were adopted for the fundamental geographic data sets (FGDS) and the way in which those spatial data are geo-referenced;

2 Member Entities shall ensure interoperability of spatial data sets through the provision of the following:

a) Solutions to ensure unambiguous identification of spatial objects (place code), to which unique identifiers under existing national systems can be mapped in order to ensure interoperability between them;
b) The relationship between spatial objects;
c) Information on the temporal dimension of the data;
d) Updates of the data.

3 Consistency of information shall be maintained for the spatial data sets between items of information which refer to the same location or between items of information which refer to the same object represented at different scales;

4 The SL-NSDI member Entities shall ensure that any information, including data, codes and technical classifications, needed for compliance with spatial data sets

implementation is made available to member Entities or third parties in accordance with conditions that do not restrict its use for that purpose;

5 In order to ensure that spatial data relating to a geographical feature the location of which spans the frontier between two or more member Entities are coherent, member Entities shall, where appropriate, decide by mutual consent on the depiction and position of such common features.

6 Each SL-NSDI member Entity shall adopt measures for the sharing of spatial data sets and services among the member Entities. Those measures shall enable those member Entities to gain access to spatial data sets and services, and to exchange and use those sets and services. The measures provided for by the member Entity shall preclude any restrictions likely to create, at the point of use, practical obstacles to the sharing of spatial data sets and services;

7 The provisions of paragraph 6 do not prevent member Entities that supply spatial data sets and services from licensing them to, and requiring payment from, the member Entities or institutions and bodies of the community that use these spatial data sets and services. The mechanisms for sharing spatial data sets and services between government and other public administrations and natural or legal person performing public administrative functions under national law may involve laws, regulations, licensing or financial arrangements or administrative procedures, for instance to protect the financial viability of those member Entities that have a duty placed on them to raise revenue;

8 By way of derogation from paragraphs 6 & 7, member Entities may limit sharing when this would compromise the course of justice, public security, national defense or international relations;

9 The provisions for data sharing and services do not affect the existence of member Entities' intellectual property rights;

10 Member Entities shall ensure that appropriate structures and mechanisms for coordinating the contributions of all those with an interest in their infrastructures for spatial information. These structures shall coordinate the contributions of, inter alia, users, producers, added-value service providers and coordinating bodies, concerning the identification of relevant data sets, user needs, the provision of information on existing practices and the provision of feedback on the implementation of data sharing and related services;

11 The SL-NSDI Executive Committee shall be responsible for coordinating the infrastructure for spatial information, as referred to in the executive mandate and this Master SLA, in the community at community level and shall be assisted for that purpose by member Entities representatives. Each member Entity shall designate a contact point

to be responsible for contacts with the Executive Committee in relation to this agreement;

12 The spatial data sharing and related services implementation shall take due account of standards adopted by the national and international bodies that are approved by the SL-NSDI Technical Committee;

13 Member Entities shall monitor the implementation and use of their spatial data infrastructures. They shall make the results of this monitoring accessible to the SL-NSDI Executive Committee and to the public on a permanent basis;

14 Member Entities shall report periodically a summary description of:

e) How public sector providers and users of spatial data sets and services and intermediary bodies are coordinated, and of the relationship with the third parties and of the organization of quality assurance, as far as practicable;
f) The contribution made by member Entities or third parties to the functioning and coordination of the infrastructure for spatial information;
g) Information on the use of the infrastructure for spatial information;
h) Data-sharing agreements between member Entities where applicable;
i) The costs and benefits of implementing the sharing of spatial data sets and services.

2.1.3 Spatial Data Services

1 The Executive Committee shall establish and operate an SL-NSDI geo-portal at community level.

2 Member Entities shall provide access to the spatial data services through the SL-NSDI geo-portal referred to in paragraph 1. Member Entities may also provide access to those services through their own access points.

3 Member Entities shall establish and operate the following spatial data services:

a) Discovery services making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata;
b) View services making it possible, as a minimum, to display, navigate, zoom in/out, pan, or overlay viewable spatial data sets and to display legend information and any relevant content of metadata;
c) Download services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly;
d) Transformation services, enabling spatial data sets to be transformed with a view to achieving interoperability;
e) Customized services allowing spatial data services to be invoked from the SL-NSDI Geospatial Portal or directly via the Entity node.

Those services shall take into account relevant user requirements and shall be easy to use, available to the public and accessible via the Internet or any other appropriate means of telecommunication.

4 For the purposes of the data services referred to in paragraph 3(a), as a minimum the following combination of search criteria shall be implemented:

a) Keywords;
b) Classification of spatial data and related services;
c) The quality of spatial data, including whether they are validated;
d) Geographical location;
e) Conditions applying to the access to and use of spatial data sets and services;
f) The Entities responsible for the establishment, management, maintenance and distribution of spatial data sets and services.

5 Every member Entity shall ensure that other member Entities are given the technical possibility to link their spatial data sets and services to the spatial data services that are offered by that individual Entity. This service shall also be made available upon request by third parties whose spatial data sets comply with data standards requirements in regard to metadata, spatial data and data interoperability.

6 By way of derogation from paragraph 3, 4 & 5, member Entities may limit public access to spatial data sets and related services where such access would adversely affect any of the following:

a) The confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law;
b) International relations, public security or national defense;
c) The course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
d) The confidentiality of commercial or industrial information where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy;
e) Intellectual property rights;
f) The confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;
g) The interests or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;

7 The grounds for limiting access, as provided for in paragraph 3, shall be interpreted in a restrictive way, taking into account for the particular case the public interest served by providing this access. In every particular case, the public interest served by disclosure shall be weighed against the interest served by the limiting or conditioning the access.

8 Member Entities shall ensure that the requirements of directives by government, parliament and councils in charge of information laws adoption such as the protection of individuals with regard to the processing of personal data and on the free movement of such data is complied with.

9 Member Entities shall ensure that:

a) The services referred to in paragraph 3(a) are available to the public free of charge;
b) The services referred to in Article 3(b) are, as a rule, available to the public free of charge. However, in cases where charges and/or licenses are an essential precondition to maintain the spatial data sets and services or to fulfill requirements of already existing international spatial data infrastructure in a sustainable way, member Entities may apply charges and/or licenses either to the person providing the service to the public, or, where the service provider chooses, to the public itself.

10 Data made available through the view services mentioned in Article 3(b) may be in a form preventing their re-use for commercial purposes.

2.2 Non-Standard Services

Not Applicable

2.3 Service Availability

2.3.1 Place of Service Delivery

The services will be delivered electronically or physically through one of the following:

- SL-NSDI Geospatial Portal
- Member Entity node
- Downloads from the GeoPortal website or Entity website
- Physical delivery (on CD or hardcopy)

2.3.2 Changes to Services

The SL-NSDI member Entities or GeoCentre shall notify the other SL-NSDI member Entities and third party of changes to the agreed upon services through appropriate communication channels (refer to the notices in section 1.13.1).

2.3.3 Delays

Any delays in the provision of the data services shall be notified through adequate communication channels as described in the section above.

2.4 Performance, Tracking and Reporting

2.4.1 Key Personnel Changes

The SL-NSDI member Entity has assigned a Technical Coordinator in order to maintain the agreement as reflected in the Master SLA and related SLA addendum. Any decision for replacement of the Technical Coordinator shall be notified to the GeoCentre and through the GeoCentre to the rest of the SL-NSDI member Entities.

2.4.2 How Each Individual Service Will Be Monitored

The SL-NSDI member Entity shall dedicate SL-NSDI/ EGIS staff that will be monitoring the quality of their provisioned data services. This can be achieved through automated and manual monitoring and reporting tools.

2.4.3 Benchmarks, Targets and Metrics To Be Utilized

Every member Entity shall develop and publicize through the GeoCentre its own benchmarks, targets and metrics for monitoring the quality of its services and customers experience. The periodical reports that are generated by the Entity would refer to the measured metrics, comparison to benchmarks and fore sought action plan.

2.4.4 Service Level Reporting

Every member Entity would reflect in its quarterly performance reports its assessment of its service level achievement compared to the set benchmarks and targets.

2.4.5 Service Review Meetings

Every quarter, the Entity representatives will conduct internal service review and supplement that by review meetings held with the GeoCentre and Entity representatives as appropriate. The final review meetings will be compiled and publicized with reference to the resulting action plan.

2.5 Problem Management

2.5.1 Support and Service Desk Services

Every member Entity shall dedicate support and service desk services that are available during the government working hours.

2.5.2 Problem Definition

The helpdesk environment will log and trace all customers' inquiries or complaints and ensure that all tickets are closed satisfactorily.

2.6 Compensation

2.6.1 Professional Fees

As pointed out in the data sharing and data services sections above and the SL-NSDI Policy Framework, the member Entities may charge fees for the provision of spatial data services where appropriate. Information about the fees structure should be made easily available as a minimum through the Entity website, the SL-NSDI Geospatial Portal website and Entity desk service.

2.6.2 Invoices and payment terms

Invoices shall be settled within a reasonable time frame between the client and the service provider.

2.6.3 Taxes

Prevailing government taxes shall be charged on top of the basic services according to existing fiscal laws.

2.6.4 Interests For Late Payment

To be defined on case by case basis.

2.7 Customer Duties and Responsibilities

2.7.1 Processing and Authorization of Invoices

The clients shall process and authorize the invoices in due time.

2.7.2 Client Personnel, Facilities and Resources

The client shall provision the necessary resources including personnel, equipment and physical facilities in order to access and process the provided data services for its internal use and benefit.

2.7.3 Training on Specialized Equipment

The SL-NSDI member Entity shall provide the client with the necessary support in order to access and utilize the offered data services effectively. This may include helpdesk, access to webinars, training manuals, etc…On the other hand, the client shall allocate qualified resources and/ or provide them with the necessary training in order to utilize the services efficiently.

2.8 Warranties & Remedies

2.8.1 Quality of Service

The SL-NSDI member Entity commits to the provision of the data services with a satisfactory quality to the client. In the case of complaints raised by the client either directly to the member Entity or via the GeoCentre, then the member Entity should react to the customer complaint and allocate the necessary resources in order to resolve the problem satisfactorily.

2.8.2 Indemnification and third party claims

The SL-NSDI member Entities are not liable to any indemnification or legal claims by third parties regarding their provided services.

2.8.3 Exclusions

Exclusions to the promised services shall be described clearly in the agreement.

2.8.4 Force Majeur

In the case of force majeur, the member Entity is not obligated to the provision of its services that are described in this agreement.

2.9 Security

2.9.1 Physical Access

The SL-NSDI member Entity and the GeoCentre shall deploy necessary security measures against physical access and tampering of their FGDS data services.

2.9.2 Logical Access

The SL-NSDI member Entity and the GeoCentre shall deploy necessary security measures against logical access and tampering of their FGDS data services.

2.9.3 Compliant with Client Security Policies

The SL-NSDI member Entity shall ensure that the data services that are downloaded by the clients are free from viruses and related threats.

2.9.4 Information and Data Security Measures

The SL-NSDI member Entity and the GeoCentre shall put in place the necessary tools, procedures and methods in order to protect data security.

2.9.5 Disaster Recovery

The SL-NSDI member Entity and the GeoCentre shall deploy the necessary disaster recovery environments in order to preserve the data in the case of natural or man-made disasters.

2.9.6 Encryption

The data transfer between the member Entity node and the client site shall be protected by standard encryption and security digital signature where appropriate.

2.10 Intellectual Property Rights & Confidential Information

2.10.1 Intellectual Property Rights

Provision of data services to the SL-NSDI community does not prevent the SL-NSDI member Entity from applying and protecting intellectual property rights.

2.10.2 Confidentiality

Confidentiality of information shall follow the existing legislation in relation to protecting private information. On the other hand, the client should refrain from providing access or use of the information to third parties without consent of the provider.

2.10.3 Court Orders

Violations of intellectual property rights and confidentiality of information will result in the recurrence to prevailing laws and jurisprudence decisions. Libyan local law shall apply in this case.

2.10.4 Destruction of Data and Records

The destruction of data and records shall be according to the data retention policy that is agreed upon by the SL-NSDI community via decisions that are taken collectively by the member Entities i.e. the SL-NSDI Technical Committee decisions. Those decisions are reflected in the Service Level Agreements between the GeoCentre and the individual member Entities.

2.11 Legal Compliance and Resolution of Disputes

2.11.1 Governing Law

In the case of litigation, the local Libyan law shall apply.

2.11.2 Export Control

The data that is provisioned by an SL-NSDI member Entity to other government Entities or third parties shall not be sent by the latter, electronically or physically, to outside Libya without a written consent of the provider.

2.11.3 Information Resolution

Information resolution including quality, accuracy and timeliness shall be expressed clearly in the SLA addendum.

2.11.4 Arbitration

Arbitration shall follow international law for arbitration.

2.11.5 Limitation of Action

The SL-NSDI member Entities are not liable either directly or indirectly in the case where they fail to provide the data services that are reflected in this agreement. However, the SL-NSDI steering committees (technical and executive) reserve the right to transfer the data custodianship to another Entity in case the latter does not meet the service level agreements to which it has committed itself. In this case, the Entity will be notified officially by the governing body of such decision after a formal process of escalation by the SL-NSDI steering committees. The entire resolution process and settlement for alternatives shall be resolved within a not-to-exceed period of 6 months.

2.11.6 Duration of Liability

In the case of infringement that is caused by the client in relation to the use of the data, the duration of liability shall be defined as part of the litigation resolution process.

2.12 Termination

2.12.1 Termination After Initial Term

The agreement shall be renewed automatically after the initial term unless there are justifiable reasons that preclude from doing so.

2.12.2 Termination For Convenience

The SL-NSDI member Entities have an obligation to contribute to the capture, maintenance and dissemination of FGDS data sets for data topics that fall under their stewardship. From this perspective, the notion of termination for convenience shall not apply.

2.12.3 Termination for Cause

The Entity may request, in the case of difficulties, the temporary transition or support of the data maintenance activity by another government Entity as an interim measure.

2.12.4 Payment of Termination

Not applicable.

2.13 General

2.13.1 Notices

Notices shall be delivered to the parties of this agreement with 48 hours. The notices shall be acknowledged by the receiving party and enacted upon within 20 working days.

2.13.2 Changes to the Agreement

Any desires for changes to the agreement can be raised during the periodical meetings of the SL-NSDI steering committees or through formal notification. The changes can be agreed upon mutually between the GeoCentre and the SL-NSDI member Entity and take effect according to the schedule outlined in the documented decisions.

2.14 Signatures

Party 1: GeoCentre

Organization: ----------

Name: ----------

Signature: ----------

Party 2: SL-NSDI Member Entity

Organization: ----------

Name: ----------

Signature: ----------

Attachments

- Addendum SLA

ANNEX K - CONFIGURATION MANAGEMENT PLAN

1. Scope and Application

The primary goal of the ITIL Configuration Management process is to achieve, through the implementation of Asset Management, a single integrated configuration management database for all configuration items. The application seamlessly supports Incident Management, Problem Management, Change Management, and Service Level Management processes. Configuration Management function is very critical for a successful and smooth operation and maintenance of the SL-NSDI Program. It deals with the entire process of change and configuration management related to the SL-NSDI system components i.e. data, applications, hardware, staff capacity building and procedures. It includes, but is not limited to, the following:

- System development automation procedures
- System maintenance automation procedures
- Logging and tracking SL-NSDI Enhancement Requirements
- SL-NSDI System Administration
- Helpdesk
- Other requirements

The GeoCentre will design and develop a configuration management strategy and internal support capacity, systems and tools that will be needed to support and manage the SL-NSDI Program operation. A configuration management plan should be prepared. This will ensure that the GeoCentre staff that will be in charge of the system operation and maintenance will have all the necessary tools and procedures to support their activities. This configuration management plan should be in line with the existing configuration management policies adopted by the GeoCentre. The objective is to define a configuration management process to manage the system routine operation activities:

- Change Management
- Quality Assurance/Quality Control
- Version Control
- Release Management

In order to support the above endeavor, the GeoCentre shall procure, customize and deploy a complete configuration management system.

2. Summary of Method

The GeoCentre shall develop and install a Configuration Management System. Once the system is installed, the GeoCentre will assign a Configuration Management Lead to be responsible for maintaining the system. This GeoCentre Configuration Management Plan provides detailed guidance for implementing configuration management (CM) for project documentation, software, and hardware, and at the project-wide level. The CM Plan is not intended to provide comprehensive guidance for performing day-to-day CM activities on the GeoCentre SL-NSDI

projects, but does provide the structured framework from which project processes and procedures should be developed. This CM Plan will incorporate the following:

- Configuration item (CI) identification schema.
- System and subsystem baselines.
- Change request (CR) classification schema.
- CM organizational components and hierarchy.
- Change request review and approval process.
- Change status reporting

The GeoCentre CM encompasses:

- CM of SL-NSDI projects documentation, hardware and software.
- CM of SL-NSDI subproject documentation, hardware, and software, as they relate to the project system baselines.

The proposed CM Plan shall describe the following:

- The SL-NSDI CM organization and its responsibilities.
- The processes and procedures to be applied throughout the present and future GeoCentre SL-NSDI projects lifecycle.
- How CM controls and changes to those products will be applied towards GeoCentre SL-NSDI products.
- How CM controls will be applied towards system changes that affect the design, development, or operation of products, subprojects, or systems within GeoCentre SL-NSDI.

The CM activities described in this plan provide the GeoCentre management that ability to identify, control, and manage all configuration items (CIs) comprising or related to the SL-NSDI project (s). CIs are any document, hardware, or software item – or aggregation of documents, hardware, or software – requiring configuration control. The CM activities will also provide status reporting of all proposed, in process, approved, and disapproved changes to the SL-NSDI project (s). In addition, the CM activities that will be described in this plan will provide GeoCentre management with additional CM control of CIs by providing a mechanism for determining the impact of change requests from one SL-NSDI system to another. The proposed CM Plan will reflect recognized industry concepts and practices. It will be a living document. The Plan will be reviewed and updated at the end of each life cycle phase, among with other project documents. These reviews will provide an appropriate forum for reassessing CM processes, procedures, and organization in light of specific decisions regarding implementation.

3. Definitions

The following definitions were identified:

Configuration Management (CM). Configuration Management is the process, approach for introducing a Configuration Management organizational framework in a team or

specific organization. The Configuration Management process, which supports to streamline the activities of the staff especially in relation to the change and maintenance management of existing and planned information management solutions, is supported by the development of a plan and the deployment of the tools that support execution of the plan as well as integration within the routine operational activities in the Entities.

Configuration Management Plan (CMP). The Configuration Management Plan (CMP) is developed in order to support the introduction of a configuration management process within the organization.

Configuration Management software. The configuration management software is an application that is procured, customized and deployed in order to support the organization in the management of the configuration management process and the maintenance of its components.

Configuration Items. The configuration items are the components of the CM process that will be tracked and updated through their entire lifecycle.

4. Cautions

Configuration Management is one of the topics that are less understood by business leaders and may necessitate an important share of awareness, commitment and resiliency by management.

5. Interferences

In order for the configuration management developments to be effective, the following dependencies and variables shall be considered that have direct impact on the Configuration Management Plan performance:

- Development of a Configuration Management Plan where configuration management roles and responsibilities are defined
- Incorporation of the configuration management business rules in the configuration management software
- Ensuring that the configuration management plan involves change management and control of the various system design components i.e. software, data, hardware, training and procedures
- Integrating the CM software with the help desk functions and the document management system in place
- Performing periodical audits and preparing management reports in order to ensure that agreed upon CM procedures are being followed

6. Personnel Qualifications

The following functional profiles will need to be handled by the GeoCentre configuration management staff:

Configuration Management Operational Plan Lead. The Lead of the Configuration Management Operational Plan is the person in charge for the development, operation and maintenance of the entire CM plan. This role could be assigned to the GIO or the Technical Manager.

Configuration Management Auditor. The CM auditor is the person in charge for conducting a periodical audit, once or twice per year, on the performance of the CM program. This person should be independent from the CM development and operational roles assigned to the various members of the GeoCentre staff. It is preferable that this person is assigned from outside the GeoCentre office.

Configuration Management Project Lead. The Configuration Management Operational Plan creates profiles for each one of the SL-NSDI projects under implementation. Therefore, the project lead is the person assigned for the creation, development and maintenance of the Configuration Identification components related to that particular project.

Configuration Management System Component Lead. The lead of a CM System component could be a person with specific expertise in that component i.e. Business and Institutional, Computing Infrastructure, Application Software, Data, and Staff Development, Recruitment and Retention.

Quality Management Coordinator. The quality management coordinator will be the person in charge for ensuring the cooperation and synchronization between the Configuration Management Plan and the Quality Management Plan.

7. Equipment & Supplies

The following tools and related developments have been identified as needed by the CM Plan:

Configuration Management Software. A CM software will be procured, customized and deployed in order to meet the GeoCentre requirements including the integration workflows with the SL-NSDI stakeholder Entities. The software will be configured to accommodate the five components of the SL-NSDI system design that are described in the attachments to the current SOP. The CM software shall have flexibility for integration with supplementary information management solutions as described below as well as the capability to custom-design and generate reports on the fly.

Interface and/or integration with HelpDesk. The helpdesk solution that is used by the GeoCentre shall be fully integrated with CM software. In this way, SL-NSDI development activities and projects will be tracked, at any one time, through an integrated change management and configuration management environment.

Integration with Electronic Document Management System. The CM software shall be fully integrated with the Electronic Document Management System. In this way, the documents change management process related to the routine GeoCentre operation will be integrated in the configuration management process.

Alignment with ISO 9000 Certification tools and resources. The Configuration Management Operational Plan will overlap and supplement activities that are overseen by the ISO 9000 system. Therefore, it will be important that both programs are coordinated through design and implementation including the use of tools and methods for tracking changes to documentation and operating procedures.

8. Procedures

Configuration management is the implementation and execution of processes and procedures that ensure the systematic and orderly control of a system and its components throughout their life cycle. CM ensures system integrity by controlling changes to any component of a system. CM involves the disciplined application of technical and administrative management of four purposes:

- Identify and document functional requirements and physical system component characteristics;
- Control system component changes;
- Record and report change request, processing and implementation status;
- Audit system components to verify conformance to requirements, specifications, and/or technical documents.

CM is key in all project environments. It is directly related to project management and quality. Effective CM is necessary to:

- Prevent delivery of incorrect products;
- Avoid high rework costs of incorrect product builds;
- Provide processes for effective control of changes;
- Manage product information;
- Quantify the impact of changes;
- Ensure reliability and a quality environment.

CM benefits include:

- Improved management of requirement change;
- Better impact analysis;
- Improved management of product information;
- More accurate project, and subproject status information;
- Increased support in managing risk;
- Greater synergy within systems, projects and subprojects.

The immediate benefits of the Configuration Management System that will be developed and deployed by the GeoCentre can be summarized as follows:

- All the major change management activities on the SL-NSDI Program development starting from its strategic system design stage and later its implementation and commissioning stages will be managed, tracked and archived through clearly defined policies and procedures;
- The entire baseline program and implementation projects documentation will be properly archived and referenced including version management and brief updates on version changes;
- The GeoCentre would have established a configuration management organization structure that will serve as a common framework for all future change management activities on the SL-NSDI Program;
- The entire procedures related to system operation and maintenance would have been developed by the GeoCentre and incorporated under the proposed configuration management organization structure. This may include, for example, logging, tracking the status and processing change requests on the system design components such as data models, applications, computing infrastructure, training, business processes, etc…;
- The CM development process would prepare GeoCentre staff since the early project implementation i.e. starting form the system strategic design and onward to be deeply involved in the system configuration management process including its design and implementation.

The following items are typically subject to CM:

- All required documentation.
- All operational software and hardware components.
- All support software and hardware.
- Any additional items considered necessary, including test data, test cases, and other resources used to test the acceptability of a system component.

CM provides visibility into the status of evolving systems. Software developers, testers, project managers, Quality Assurance (QA) personnel, and customers benefit from CM information. CM answers the following:

- What changes were made to the system?
- When were the changes to the system made?
- Who made changes to the system?
- Why were the system changes made?

The CM discipline comprises five requirements categories:

- CM organization requirements;
- Configuration identification requirements;
- Configuration control requirements;
- Configuration status accounting requirements;
- Configuration auditing requirement.

These five categories are the foundation for successful CM. Subsections 8.8.1 though 8.8.5 describe each of the five categories.

i. Configuration Management Organization Requirements

CM organization regulates established CM practices (such as configuration identification, control, status accounting and auditing) and facilitates coordination among systems that interface or have design, functional, and/or operational dependencies. The CM organization's operational objectives include:

- Verifying that CIs meet the specified requirements.
- Ensuring that CIs are recorded with all known cross-system interfaces.
- Tracking CI status through auditing activities, and taking appropriate corrective action when problems are discovered.
- Confirming that representatives from all affected systems agree on the configuration of pertinent CIs and changes to the configuration of those pertinent CIs.
- Prioritizing change requests.

The CM organization must comprise individuals who:

- Possess authoritative influence and can control or provide direction regarding CM responsibilities and assignments.
- Have a vested interest in the successful integration and certification of the enterprise-wide system.
- Have a vested interest in the success of the system.
- Possess authoritative influence on resource allocation decisions.
- Have a thorough understanding of CM concepts and procedures.
- Have considerable system life cycle experience.

ii. Configuration Identification Requirements

Configuration identification involves classifying a system's structure, uniquely identifying individual system components, and documenting the components' functional and physical characteristics. The goals of configuration identification are to identify the system's components throughout the life cycle and to provide traceability between a system and related system products. Configuration identification answers the following: *What is the system configuration? What are the system components?* and *What is the version of this system component?*

Configuration identification activities include:

- Selecting items to be placed under configuration control;
- Creating a nomenclature for uniquely identifying system components;
- Identifying the various system component versions;
- Defining relationships and interfaces among various system components.

iii. Configuration Control Requirements

Configuration control begins after CIs are formally identified. Configuration control refers to the evaluation, coordination, approval or disapproval, and implementation of changes. It also involves managing release of, and changes to, system components throughout the system life cycle. The goal of configuration control is to establish mechanisms that will help ensure the production and maintenance of quality system components. Configuration control answers the following: *What is controlled? How are changes to system components controlled?* and *Who controls system changes?*

Configuration control activities include:

- Defining the change process;
- Establishing change control policies and procedures;
- Maintaining system component baselines;
- Processing system component changes;
- Tracking and documenting changes;
- Controlling releases of system components.

iv. Configuration Status Accounting Requirements

Configuration status accounting activities include document and report information describing specific configuration items and their corresponding status. To manage CIs effectively, the CM organization must have access to this status information. The goal of status accounting is to provide a status record of all CIs, thus maintaining the traceability of all changes to a CI throughout its life cycle. Configuration status accounting answers the following: *What is the current configuration status for a CI? What are the current changes being considered? What changes have been made to the CI?* And *how many components will be affected by this change?*

Configuration status accounting activities include:

- Determining types of logs and reports required;
- Tracking the status of CIs;
- Tracking the status of changes to the system;
- Reporting system status;
- Recording and reporting on CM activities.

v. Configuration Auditing Requirements

The goals of configuration auditing are to:

- Ensure that CM processes and procedures are properly applied and support the organization's goals and objectives;
- Verify that all CIs are correctly identified, described, cross-referenced and produced;

- Verify that all approved changes to a CI are completed.

For application software, Internal Audits (IAs) will be implemented. Configuration audits answers the following: *Has the CI been controlled using the defined CM procedures?* and *Are all changes incorporated in this version of the CI?*

Configuration audit activities include:

- Defining audit schedule and procedures;
- Performing audits of the established baselines;
- Documenting and reporting audit results.

9. Quality Control & Quality Assurance

The quality control and quality assurance of the Configuration Management process is integrated inherently in one of the organizing components of the CM Plan that was described in section 8.8.5 Configuration Auditing Requirements.

10. Reference

The GeoCentre Configuration Management SOP is complemented by instructions describing the development and maintenance framework for the various components of an information system. Those instructions are described in detail below for the following:

- Instruction for Business and Institutional Component
- Instruction for Computing Infrastructure Component
- Instruction for Application Software Component
- Instruction for Data Component
- Instruction for Staff Development, Recruitment and Retention Component

Attachment A Instruction for Business and Institutional Component

The GeoCentre information management systems will therefore be structured specifically to meet critical business requirements of the SL-NSDI Community. The GeoCentre information management system design and configuration management approach will therefore be structured around a business centric perspective to take advantage of both the use of new tools to carry out existing work, as well as introduction of technology-supported innovations in the basic business activities with the end goal being to make the GeoCentre more efficient and effective.

vi. Business Process Management

GeoCentre business process management. GeoCentre Officer is responsible to ensure that all information management initiatives carried out by the GeoCentre are consistent with its primary

mandate and responsibilities. He will also be responsible to ensure that any information management solution development undertaken by the GeoCentre is well integrated into the actual business workings and processes of the GeoCentre, and external stakeholders where these are involved. Annual review of issues and associated configuration management efforts will take into account issues related to business and business process alignment that may be needed to optimize system utilization.

Community business process management. The Technical Committee is responsible to ensure that all enterprise SL-NSDI developments are well integrated into the cross-agency business processes and interactions with external Entities where these are involved. Annual enterprise review of SL-NSDI development issues and associated configuration management efforts will take into account issues related to business and business process alignment that may be needed to optimize system utilization with external stakeholders.

vii. IM Budgeting

GeoCentre operation budgeting. The GIO is responsible to assess operational resource requirements on an annual basis. Funding for new initiatives, projects and programs will be established through the methods described previously.

Community SL-NSDI developments budgeting. The GIO will submit its annual budget to the SEC after consultation with the Technical Committee, and will provide the SEC with an assessment of any areas that need alignment or refinement to best support community interests and optimize the community SL-NSDI investments.

viii. Institutional Performance Monitoring

The strategic plan shall make provision for the GeoCentre to conduct "Balanced Scorecard" type institutional performance monitoring, assessment and adaptive management for its SL-NSDI developments and internal operation initiatives. Once the GIO has received the requisite training in the Balanced Scorecard or equivalent method, he will design a monitoring and assessment program for the GeoCentre, and the procedures therein will be used to complete this section of the SOP instruction manual.

Attachment B Instruction for Computing Infrastructure Component

The planning, design, implementation, operations, maintenance and configuration management of the GeoCentre computing infrastructure will be carried out in reference to the ITIL best practices. The SL-NSDI project team has made provision for the GeoCentre to adapt the ITIL model to fit the SL-NSDI Program requirements. Once this program has been completed, the procedures from that adaptation will be summarized to complete this portion of the current instruction manual.

ix. CI Development

TO BE DETERMINED

x. CI Maintenance and Configuration Management

TO BE DETERMINED

Attachment C Instruction for Application Software Component

The precise method for the development of enterprise application software at the GeoCentre will be left to the discretion of the project manager and the consultant to maintain maximum flexibility and promote new innovations and creativity in this process. However, in general whatever method is applied should incorporate the basic principles outlined below.

xi. Applications Development

Applications development consists of the following steps:

1. ***Problem Definition*** - After a user's request is received, the EC makes a decision whether to accept or reject a project. The user's request and any comments or refinements recommended by the EC and explicit direction to proceed becomes the basis for the Project Manager to begin the project. Once assigned, the Project Manager reviews all documents with the project and begins to develop a detailed plan, in direct cooperation with all the relevant team members and end user representatives.

2. ***Process Analysis*** - The project team will begin the project with a thorough understanding of the business process being modeled. The project team must become familiar with the user's business processes before developing the discrete tasks to accomplish the project. This includes determining problems that exist in the current system, specifying objectives and goals, and listing possible system constraints or limitations. A determination and definition of interfaces with any other existing system, and requirements within or between departments, must also be completed. This involves all organizations that either are sources of data or users that require information from this particular system. Full analysis of the system must be conducted to produce the functional requirements of the entire system.

3. ***Functional Description*** - After conducting a process analysis, the project team will develop a functional description. The functional description defines the system requirements and provides the requestor with a clear statement of the operational capability to be developed, as well as any relationships or linkages to any existing or in-development systems. If the requirements change at any point, the functional description should be updated and receive concurrence from the users and other overseers, depending

on the scale and impact of the initiative. The functional description is the basis for mutual understanding between development team, the users, and the overseers.

4. ***User Requirements*** - After the functional description is developed, the project team must determine exactly what is to be included in the system design and define these elements. A list of every single necessary requirement that the new system must accommodate as well as those features that are desirable must be prepared. System features that the user would like to have incorporated in the new system must be recorded. Specifications must be based on what the user wants and needs, not on what the project team Project wants.

5. ***System Design*** - In the design phase, the functional requirements are further developed and refined. Possibly, several alternate approaches may be conceptualized and compared from the standpoint of best cost and benefit factors, including the potential for using ready-made Commercial-Off-the-Shelf (COTS) software packages where these can meet GeoCentre needs to a reasonable extent. Mock-ups of new forms, reports, screens, and other systems documents may be prepared, if the project is a software project. Prototyping is encouraged so that the user has an opportunity to approve the design. For software design projects, the file structures and report design must be accomplished. For all projects, the impact on systems and networks must be determined before a design is approved. Once an acceptable design has been developed, the project team may need to refine the work plan timeframe and resource requirements. The Project Manager must consider the project team members' other commitments to develop a realistic time line. The SEC will approve any major revisions to the project team or schedule, and the supervisors of the project team members must be kept notified of these changes. The workforce-loading plan can be in any format, but the Project Manager may find it useful to develop a matrix of tasks and project team members with the number of hours each team member should expect to work on a task. Critical tasks, tasks that must be completed before other work can be done, should be defined. During the design phase the Project Manager should reassess the lifecycle cost and benefit assumptions under which the project was conceived, and obtain re-approval if the changes are significant.

6. ***System Development*** - During this phase, the system design is implemented. If design changes are required, it may be necessary to revisit earlier steps to ensure that the system is designed properly. Operation, use and maintenance information is developed. The system is developed in accordance with prescribed GeoCentre standards.

7. ***Acceptance Testing*** - A test plan must be devised that states which tests will be conducted to verify that the system complies with the requirements identified in the user requirements specification. The test requirements are developed, the scope of the test is identified along with pass/fail criteria, and the system is tested. The entire integrated system must be tested to ensure that the hardware and all software components work as designed. All testing must take place in a controlled environment before the complete project is introduced to users. A functional configuration audit is performed to ensure that

system performance complies with requirements specifications and any approved changes. A physical configuration audit is performed to ensure all deliverables have been in fact produced, procedures were followed, and standards were adhered to.

8. ***User Training*** - Any change in a system requires at least new knowledge and usually new skills on the part of operators, administrators, users, and managers. Orientation on the system is required for everyone in the organization affected by the new system. If the project was not to create a new system, but to revise a system, modify a network, or release a new version of software, somewhat less training may be required. For some, orientation may require only a short memo, for others several hours of briefings. Training requires the teaching of new skills and may include techniques such as formal classroom training sessions, training aids, practice sessions, and assistance on the job. The Project Manager is responsible for developing training plans based on system requirements.

9. ***Documentation*** - Documentation must be prepared as required. At a minimum, there must be sufficient documentation to fully describe and explain all system programs and operations, or changes and the reasons for the changes. A maintenance manual must include, at a minimum, the production environment, location of all external files used, and a list of all files needed by the system with a summary of information on each. This type of document is essential for trouble-shooting purposes, for modifying or upgrading the existing system, and for designing a new one. It is also essential to prepare guidance to the people who will operate the system. Documents must be readable and understandable to the user who must approve them.

10. ***Operation*** - The system is implemented and turned over to the user. Data creation and data conversion from the old system to the new system must be accomplished, if necessary. If the system is a replacement for an existing system, phase out of the old system must be planned.

11. ***Evaluation*** - All team members will contribute lessons learned on the project and send them to the Project Manager for consolidation. These will be carried out both for interim project reviews as described previously, as well as for the final project evaluation. Lessons learned will be compiled into a written record for future reference and maintained with other documentation for the project. If applicable, the Project Manager will prepare a Future Action Plan on possible upgrades and enhancements.

xii. Software Maintenance and Configuration Management

ANNEX L - BUSINESS CONTINUITY AND DISASTER RECOVERY PLAN

The SL-NSDI platform is intended to support data sharing across a broad community of diverse user organizations in Sri Lanka. Many of these organizations will increasingly rely on the platform within their own daily activities, thus the continuous functioning of the SL-NSDI data and application services will become even more mission critical to the functioning of the government over time. It will be important therefore that an SL-NSDI Disaster Recovery and Business Continuity Plan be prepared and adopted by the GeoCentre.

The SL-NSDI platform is to be built upon the ICTA Lanka Government Cloud environment. As such, the disaster recovery and business continuity (DR/BC) measures that will ensure the continuous operation of the Platform are in large part dependent upon those adopted by ICTA to manage the Lanka Government Cloud. The ICTA has not yet developed such DR/BC plan, thus it is not yet practical to fully articulate a plan for the SL-NSDI which is a sub-dependent system within the Government Cloud environment. In lieu of a full plan, this Annex provides an outline for such plan and identifies those portions that have special considerations that are relatively unique to the SL-NSDI.

Much of the information provided here has been adapted from material provided online by Disaster Recovery.org [2] and Stay In Business (SIB)[3].

Business Continuity Planning is the way an organization can prepare for and aid in disaster recovery to ensure that impacts to mission critical activities and functions across the SL-NSDI user community are avoided, minimized or mitigated. It is an arrangement agreed upon in advance by management and key personnel of the steps that will be taken to help the organization recover should any type of disaster occur. These programs prepare for multiple problems. Detailed plans are created that clearly outline the actions that an organization or particular members of an organization will take to help recover/restore any of its critical operations that may have been either completely or partially interrupted during or after (occurring within a specified period of time) a disaster or other extended disruption in accessibility to operational functions. In order to be fully effective at disaster recovery, these plans are recommended to be regularly practiced as well as outlined.

In layman's terms, a **Business Continuity Plan** or BCP is how an organization guards against future disasters that could endanger its long-term health or the accomplishment of its primary mission. BCPs take into account disasters that can occur on multiple geographic levels-local, regional, and national-disasters like fires, earthquakes, or pandemic illness. BCPs should be live and evolving strategies that are adjusted for any potential disasters that would require recovery; it should include everything from technological viruses to terrorist attacks. The ultimate goal is

[2] http://www.disasterrecovery.org/index.html
[3] http://www.stayinbusiness.com/

to help expedite the recovery of an organization's critical functions and manpower following these types of disasters. This sort of advanced planning can help an organization minimize the amount of loss and downtime it will sustain while simultaneously creating its best and fastest

Disaster Recovery (DR) is the process that an organization applies to recover access to their computing infrastructure and data and that are needed to resume normal, critical business functions after the event of either a natural disaster or a disaster caused by humans. While Disaster Recovery plans, or DRPs, often focus on bridging the gap where data, software, or hardware have been damaged or lost, one cannot forget the vital element of manpower that composes much of any organization. A building fire might predominantly affect vital data storage; whereas an epidemic illness is more likely to have an affect on staffing. Both types of disaster need to be considered when creating a DR Plan. Thus, organizations should include in their DRPs contingencies for how they will cope with the sudden and/or unexpected loss of key personnel as well as how to recover their data.

Disaster Recovery Plans are generally part of the larger and more extensive Business Continuity Planning (BCP) process. Like BCP's, DR plans should be well practiced so that the key players are familiar with the specific actions they will need to take should a disaster occur. DR plans must also be adaptable and routinely updated, e.g. if new people, a new branch office, or new hardware or software are added to an organization they should promptly be incorporated into the organization's disaster recovery plan. Companies must consider all these facets of their organization as well as update and practice their plan if they want to maximize their recovery after a disaster.

Business Continuity/Disaster Recovery Plans come in various forms, each reflecting the corporation's particular set of circumstances. The following general steps may be taken in the development of a plan:

1. Policy Statement (Goal of plan, reasons and resources;
2. Business Impact Analysis (how does a shutdown impact the business financially and otherwise);
3. Identify Preventive Steps (can disaster be avoided by taking prudent steps);
4. Recovery Strategies (how and what you will need to recover);
5. Plan Development (Write plan and implement plan elements);
6. Plan buy-in and testing (very important so that everyone knows the plan and knows what to do);
7. Maintenance (continuous changes to reflect current situation).

The following provides a summary of the topics that need to be addressed in the BC/DR plan, and an identification of any topical areas that may have special implications for the SL-NSDI. Once the ICTA has prepared a BC/DR for the Lanka Government Cloud, any special conditions related to geospatial information and the SL-NSDI can be added to that plan. This outline has been copied and/or paraphrased from the "Business Continuity Plan Template" sponsored by Stay In Business (SIB).

1.0 PROMULGATION STATEMENT

The promulgation statement should briefly outline the organization and content of the Continuity Plan and describe what it is, who it affects, and the circumstances under which it should be executed. Promulgation is the process that officially announces/declares a plan. It gives the plan official status and gives both the authority and the responsibility to organizations to perform their tasks. The organization head or a designee may approve the Continuity Plan. Once signed, the promulgation statement officially announces the Continuity Plan. This will need to include ICTA, the GeoCentre and all the major data custodian and user organizations.

2.0 ANNUAL REVIEW

On an annual basis, the Continuity Plan, Essential Functions, and Business Process Analysis should be reviewed and updated, if changes occur, as well as documenting the date of the review and the names of personnel conducting the review. This needs to be carried out both for the GeoCentre as well as each of the major data custodian and mission-critical users of the common infrastructure.

3.0 RECORD OF CHANGES

Planners should track and record the changes using a record of changes table when changes are made to the Continuity Plan outside the official cycle of plan review, coordination, and update. The record of changes should contain, at a minimum, a change number, the date of the change, the name of the person who made the change, and a description of the change.

4.0 RECORD OF DISTRIBUTION

The record of distribution, usually in table format, should indicate the title and the name of the person receiving the plan, the agency to which the receiver belongs, the date of delivery, the method of delivery, and the number of copies delivered. The record of distribution can be used to verify that tasked individuals and organizations have acknowledged their receipt, review, and/or acceptance of the plan.

5.0 PURPOSE, SCOPE, SITUATIONS, AND ASSUMPTIONS

A. PURPOSE. The introduction to the Continuity Plan should explain the importance of continuity planning to the organization and why the organization is developing a continuity plan. It may also discuss the background for planning, referencing recent events that have led to the increased emphasis on the importance of a continuity capability for the organization. For the SL-NSDI it will be important to point out that this is a major common infrastructure supporting hundreds of business processes across nearly all sectors in government. While not all SL-NSDI supported business

applications will be mission critical to the minute, some could be and others may suffer consequences if not resolved in a day or two.

B. SCOPE. The scope should describe the applicability of the plan to the organization as a whole, headquarters as well as subordinate activities, co-located and geographically dispersed, and to specific personnel groups in the organization. It should also include the scope of the plan. Ideally, continuity plans should address the full spectrum of potential threats, crises, and emergencies (natural and man-made). The SL-NSDI will have a central facility in Colombo and subsidiary stakeholder nodes in every Province and District across the entire Country.

C. SITUATION OVERVIEW. The situation section should characterize the "planning environment," making it clear why a continuity plan is necessary. In this section, organizations should reference their risk assessment to summarize the hazards faced by their organization and the relative probability and impact of the hazards.

D. PLANNING ASSUMPTIONS. This section should familiarize the reader with the underlying assumptions made during the planning process. Sample text for this section is provided below.

E. OBJECTIVES. All plans and procedures should list the objectives that the plans are designed to meet. Sample text for this section is provided below.

F. SECURITY AND PRIVACY STATEMENT. This section should detail the classification of the Continuity Plan. Since continuity plans and procedures are sensitive, organization-specific documents, at a minimum, organizations should classify their plan as "For Official Use Only". Further, if the Continuity Plan includes a roster of continuity personnel that includes personal information, such as telephone numbers, that information is protected under the Law. Organizations should consult with their security office, or similar entity, to ensure their continuity plans and procedures are appropriately classified and marked. This section also includes dissemination instructions, including to whom and via what means the organization will disseminate the plan.

6.0 CONCEPT OF OPERATIONS

A. PHASE I: READINESS AND PREPAREDNESS. This section should address the readiness and preparedness activities to ensure personnel can continue essential functions. Readiness is the ability of an organization to respond to a continuity event. This phase includes all organization continuity readiness and preparedness activities. Organizations should only include those readiness and preparedness activities and systems that are applicable to their plan.

B. PHASE II: ACTIVATION. This section should explain the activation process from the primary operating facility and provide a process or methodology for attaining operational capability at the continuity facility(ies) with minimal disruption to operations within 12 hours of plan activation. This section should also address procedures and guidance for organization personnel who will not relocate to the continuity facility.

C. PHASE III: CONTINUITY OPERATIONS. This section should describe the initial arrival process and operational procedures for the continuation of essential functions.
D. PHASE IV: RECONSTITUTION OPERATIONS. Organizations should identify and outline a plan to return to normal operations once organization heads or their successors determine that reconstitution operations for resuming normal business operations can be initiated.
E. DEVOLUTION OF CONTROL AND DIRECTION. Devolution planning should support overall continuity planning and addresses the full spectrum of all-hazard/threat emergency events that may render an organization's leadership or staff unavailable to support, or incapable of supporting the execution of the organization's essential functions from either its primary operating facility or continuity facility. Note: Organizations that use a devolution plan that is separate from their continuity plan should include baseline information from their devolution plan in this section including references to where this information is located in their devolution plan.
F. PROCEDURES FOR DEVOLVING ESSENTIAL FUNCTIONS TO DEVOLUTION EMERGENCY RELOCATION GROUP (DERG) AT DEVOLUTION SITE. This section should identify those procedures and instructions on how the organization will devolve functions to the DERG at the Devolution site and detail the transition of responsibilities to the deployed ERG or DERG.

7.0 ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

This section should include additional delineation of continuity responsibilities of each key staff position.

8.0 DIRECTION, CONTROL, AND COORDINATION

This section should describe the framework for all devolution of control, direction, and coordination activities.

9.0 DISASTER INTELLIGENCE

This section should describe the required critical or essential information common to all continuity events. In general terms, it should identify the type of information needed, where it will come from, who will use it, how it will be shared, the format it will be provided in, and when (time) the information will be needed.

10.0 COMMUNICATIONS

This section should address communications systems needed to ensure connectivity during crisis and disaster conditions. The ability of an organization to execute its essential functions at its continuity facility(ies) depends on the identification, availability, and redundancy of critical communications and information technology (IT) systems to support connectivity among key organization leadership personnel, internal organization elements,

other organizations, critical customers, and the public, during crisis and disaster conditions.

11.0 BUDGETING AND ACQUISITION OF RESOURCES

The Budgeting and Acquisition section should identify the people, communications, facilities, infrastructure, and transportation requirements necessary to the successful implementation and management of an organization's continuity program. In addition, the organization should identify and provide funding and specific budgetary guidance and requirements for all levels of the organization, including subordinate components and state offices. This section aligns with the Administration, Finance, and Logistics section of the Comprehensive Preparedness Guide 101.

12.0 MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

Organizations should develop a Continuity Multi-Year Strategy and Program Management Plan (MYSPMP) that provides for the development, maintenance, and annual review of Continuity capabilities requiring an organization to consider: Essential Functions performance; short- and long-term goals/objectives for plans/procedures; issues, concerns, or potential obstacles to implementing their program and strategies for addressing them; planning/TT&E activities and milestones for accomplishing; ERG members, infrastructure, communications, transportation, and other resources needed to support the program; budgetary requirements; risk management principles and primary and Continuity facility risk assessments to ensure appropriate operational readiness decisions are based on the probability of an attack or other incident and its consequences; geographic dispersion into the organization's normal daily operations; security strategies addressing personnel, physical, and informa tion security to protect plans, personnel, facilities, and capabilities; and a CAP.

13.0 PLAN DEVELOPMENT AND MAINTENANCE

This section should describe the process the organization uses to maintain the currency of the Continuity Plan. It identifies who is responsible for plan currency, how often the plan will be reviewed and updated, and describes the coordination process.

14.0 AUTHORITIES AND REFERENCES

The key authorities and references on which the organization's continuity plan is based should be listed here.

The SL-NSDI will listing of authorities and references will need to include both the GeoCentre as well as all the critical data custodian and major user organizations.