Interim

United Nations Spatial Data Infrastructure Framework[1]

January 2009 to December 2010

in support of

- *Humanitarian Response*
- *Economic Development*
- *Environmental Protection*
- *Peace, Safety and Security*

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[1] This document represents collective efforts of the participants in the February 2008 "Rome UNSDI Deliverables Workshop," the June 2008 "Geneva UNSDI Stakeholder Meeting" and the 9th Plenary of UNGIWG in Vienna on 5-7 November 2008. It does not necessarily reflect the official endorsement of any UN Agency, Fund or Programme.

Version History

Name	Version	Date	Description
FA	0.1	19/2/08	1st Compilation
SU	0.2	27/2/08	2nd Compilation
SU	0.4	9/3/08	1st Draft
SU	0.5	12/3/08	1st Draft updated with Capacity Building and Core Datasets v 6.0 revisions
KS	0.6	31/3/08	2nd Draft in view of co-chairs review
BMcD	0.7	3/4/08	2nd Draft FIS Manager
BMcD	0.8	3/4/08	Document renamed as UNSDI Framework
SU	0.9	6/4/08	2nd Draft with Secretariat's edits
SU	1.0	19/5/08	Final draft incorporating feedback received by 16/5/08
AH	1.1	21/5/08	Final with AH's revisions and KS's endorsement
AH	1.2	29/9/08	3rd Draft incorporating member comments post Geneva June 08 Consultative Meeting
SU	1.3	13/10/08	3rd Draft with revised UNSDI Core Deliverables
SU	1.4	29/10/08	4th Draft incorporating member comments
SU	1.5	29/11/08	5th Draft based on revisions agreed to at UNGIWG-9
SU	1.6	11/12/08	Final based on all UNSDI Lead Agency feedback and UNGIWG Member comments

Table of Contents

1   Introduction

The agencies of the UN System deliver more services in more places than ever before and in doing so produce data and information which they share among themselves, with Member States and non-governmental organizations (NGO), as well as other institutions. From peacekeeping to humanitarian relief, from climate change to disaster reduction, response and recovery; from environmental protection to food security and economic development, UN

> A Spatial Data Infrastructure or SDI is a framework of spatial data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way. Another definition is the technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data.
>
> Wikipedia, 4 April 2008

Agencies are increasingly leveraging their capacity to manage geospatial information to raise their operational efficiency, including through building partnerships across the UN System and with relevant institutions and Member States.

Since 2000, the UN Geographic Information Working Group (UNGIWG), an assembly of more than 30 UN Secretariat Departments, Funds, Programmes and Specialized Agencies, has sought to increase the efficiency of the UN by sharing geographic information, adopting common standards and sharing resources. Although much had been achieved in the first half of the decade, by 2005 UNGIWG Members recognised that if the potential efficiencies were to be truly realized and made sustainable, a strategy was required that would better institutionalize the mechanisms and processes for collaboration. In developing this strategy, the UNGIWG Membership called for the creation of a UN Spatial Data Infrastructure (UNSDI) that would allow geographic information to more substantively contribute to the mission of the United Nations and enhance its capacity to "Deliver as One".

The vision for UNSDI is for the creation of a comprehensive, decentralised geospatial information framework that facilitates decision making at various levels within the UN by enabling access, retrieval, dissemination and use of geospatial data and information (scientific, environmental, social and economic data, etc.) in a rapid and secure way. The creation of a UNSDI will provide the institutional and technical foundation of policies, data and interoperability standards and procedures that will enable organizations and technologies to interact in a way that facilitates spatial data discovery, evaluation and applications. Given that UN Agencies vary in their ability to utilise and manage geospatial information it is foreseen that a UNSDI could reduce development and operational costs by working together to achieve economies of scale through common standards, guidelines and implementation tools. Thus, the development of a UNSDI is considered essential for increasing system coherence in the use and exchange of geospatial data for UN activities. Achieving this vision is complementary to UN reform and to delivering on the Millennium Development Goals, and attending to the remits of evolving global governance.

The aim of this "Framework for the Implementation of the United Nations Spatial Data Infrastructure" (hereafter referred to as the Interim UNSDI Framework) is to obtain the approval and agreement of participating UN organizations at senior executive management level, including for establishing and/or sponsoring a UNSDI Project from which to provide overarching institutional and technical governance to lead participating

UN entities in the creation of geospatial data standards, development of common and thematic geo-datasets and the provision of interoperable geospatial services.

The Interim UNSDI Framework identifies priorities agreed to and defined by UNGIWG Members as core and non-core deliverables that constitute Phase One UNSDI Implementation in 2009-10. UN capacity building by developing institutional and technical governance processes for core geo-datasets and interoperable services are Core UNSDI Deliverables. Development of thematic geo-datasets and capacity building of external partners, including interested Member States, constitute non-core UNSDI activities dependent on available resources of individual agencies with institutional mandates for supporting such capacity building.

2. Interim UNSDI Framework

The Interim UNSDI Framework is designed to outline the required components or "deliverables" necessary to implement a UNSDI in 2009-10, the first phase of implementation. The Framework states the purpose and scope of each deliverable and its expected outputs; and it identifies the lead UN entity per deliverable as well as those UN partners who will participate. This framework format is modular and reflects the decentralized approach to be taken in the implementation of the UNSDI and allows for selected funding of specific deliverables. Hence, interested funding agencies and donors can select deliverables according to their programme priorities, including funding of non-core deliverables such as thematic datasets or capacity building.

As the UNSDI is an inter-agency initiative born out of necessity to efficiently share, exchange and re-use geospatial data and information, the Framework provides an overarching approach that situates individual agency geo-spatial initiatives, as well as inter-agency activities, in a coherent action plan towards a UNSDI. It is divided into two complementary sections:

1. Core activities which are of an inter-agency nature. These activities primarily refer to the development of UN guidance materials and agreements for the development and exchange of geospatial data that are outside the mandate of one single agency.

2. Supporting intra-agency geospatial activities that fall within the mandate of individual agencies.

In the short term, UNSDI is an investment into the capacities of the United Nations System to manage its existing geospatial assets more effectively. In the longer term, UNSDI could serve as a model and vehicle for capacity building in Member States that request assistance from the United Nations in managing and applying geospatial data to support their national development agendas through the development of their National Spatial Data Infrastructures (NSDI). The implementation of this UNSDI framework is based primarily on existing agency capacity, which means that the activities are realistic and quantified, with project plans being in-line with agency mandates and work planning processes.

It should also be noted that UNSDI will not be implemented in one go. It will require the sustained effort of all UN Agencies, Funds and Programmes over an extended period of time in alignment with and active support of Member States which have or are developing their own NSDIs.

Whilst the Interim UNSDI Framework sets the scope and approach; individual agencies will need to adapt and implement the agreed policies and standards within their respective work plans. They will also need to make the institutional commitment, at the

Under-Secretary General and Executive Director level, to publicly state that their data holdings are a public good and will be made available for use by all members of the United Nations and their citizens while taking the necessary data security precautions for protection of confidentiality and privacy.

3 UNSDI and UNGIWG

The United Nations Geographic Information Working Group (UNGIWG) is currently the sponsor of the UNSDI concept and the Interim UNSDI Framework. Following the decision of the 6th UNGIWG Plenary, held in Addis Ababa, Ethiopia in October 2005, to embark on a UNSDI development initiative, at its 7th and 8th plenary meetings held in 2006 in Santiago de Chile and in 2007 in Bangkok, Thailand, UNGIWG developed the vision, strategy, and institutional governance framework for a UNSDI along the following lines:

- The UNSDI initiative is project-based, at least in the initial phase (January 2009 – December 2010);

- The UNSDI Project is defined around project outputs or deliverables that can involve non-UN partners. This approach reflects the diversity of UN and its principal pillars: political, peace, safety and security, development, environment and humanitarian;

- In the medium-term, the UNGIWG Membership recognizes that the UNSDI initiative requires legislative legitimacy through either the Chief Executive Board (CEB) endorsement, a General Assembly or through an Economic and Social Commission (ECOSOC) Resolution, as well as institutional anchorage within the UN System.

In February 2008, the World Food Programme (WFP) hosted a *UNSDI Deliverables Workshop* in Rome in order to further define a set of UNSDI Deliverable Proposals through a consultation process. The Interim UNSDI Framework Document represents the outcomes of the workshop, as well as the subsequent review process amongst the UNGIWG Membership and major stakeholders, including at the June 2008 *UNSDI Stakeholder Meeting* in Geneva, comments received in October 2008 in preparation for the 9th UNGIWG Plenary Meeting (UNGIWG-9) in Vienna on 5-7 November and the agreement reached among participants on 7 Nov. 2008, the last day of the UNGIWG-9, regarding the final revisions to the Framework.

The UNSDI deliverables developed in Rome (Feb. '08) and subsequently revised and further developed in Geneva (Jun. '08) and Vienna (Nov. '08) address the following:
- Technical Governance of Core Geo-datasets;
- Interoperable Geospatial Services
- Thematic Geo-datasets;
- Capacity Building.

The development of Thematic Geo-datasets that fall within the responsibility of specific agencies are outlined in Annex A. Although capacity building in the larger context of the term is not prioritised during UNSDI Phase One as a core UNSDI activity, it is envisaged that it will gain importance as UNSDI matures and the UN System is in a position to provide this service – if requested - to the Member States. It would be done with additional funding from donors and in collaboration with partners such as national

(NSDI) and regional SDI initiatives (e.g. Infrastructure for Spatial Information in Europe, (INSPIRE), other regional organizations, the Global Spatial Data Infrastructure (GSDI) Association, Permanent Committee on GIS Infrastructure for Asia & the Pacific (PCGIAP), etc.)

There is no doubt that the realization of a UNSDI poses mandate, institutional and technological challenges. However, it is a necessity that has been identified by the geo-information specialists of more than 30 Agencies, Funds and Programmes represented in UNGIWG. At the 9th Plenary of UNGIWG on 7 Nov. 2008 in Vienna, representatives of 17 UNGIWG Members present all reached consensus and adopted the 9th UNGIWG Plenary Resolution (Annex C) which endorses the Interim UNSDI Framework Document on the provision that it be revised per the agreement reached at the Plenary. This document is the end result of the consultative census building process.

In order for UNSDI to succeed it needs to be seen as a priority by the United Nations organizations participating in UNGIWG. It is for this reason that the adopted UNSDI Framework focuses in this initial implementation phase on the establishment of the minimum technical governance requirements for the identification and production of UNSDI core geo-datasets and the provisioning of a select set of interoperable geospatial services as sufficient and necessary for the proof of UNSDI's added value in direct support to the UN Reform process and improving UN System's coherence.

4   UNSDI Institutional Governance

The UNSDI Project requires an agreed institutional governance structure with procedures that will ensure accountability in the management and oversight of the project and in the alignment of deliverables to agreed strategic UNSDI priorities. The institutional governance structure will provide linkages between UN Executive Management and the technical governance of the UNSDI project staff and guide Participating Agencies at the technical working level. Further, the institutional governance clarifies relationships between UNGIWG Members, partners and donors, including appropriate levels of participation of non-UN partners with respect to supporting deliverables.

As seen in Figure 1, UNSDI Architecture, a *Steering Committee* to be constituted at senior management level of 7-9 UNGIWG Members is recommended. It should be inclusive of UNGIWG Chairs during their two-year rotational terms and up to seven additional representatives from other UN entities, preferably at the D1 level or above. To ensure continuity of strategic oversight and support to the Steering Committee, UNGIWG Chairs should remain on the committee for a minimum of one year past their rotation. The UNSDI Steering Committee would recommend the approval of the annual UNSDI project work plan based upon priorities defined per the strategic goals of UNSDI and on the advice of the *Technical Advisory Group*.

The Technical Advisory Group (TAG) is made up of technical experts nominated by UNGIWG Members and endorsed by the Steering Committee which also adopts the rules governing the formation and the Terms of Reference of the Technical Advisory Group. TAG would both advise the Steering Committee on technical matters and priorities as well as provide technical advice and support to the UNSDI *Project Team.*

The UNSDI Project Team, once fully staffed, will consist of full-time managerial, technical and administrative staff dedicated to the successful implementation of UNSDI Phase One. It will be activated with the establishment of the UNSDI Project and the allocation of sufficient funds and/or secondment of staff by participating UNGIWG

Members who are responsible for and lead UNSDI Project components. UNSDI Project Team members will hold regular posts filled through an open and competitive recruitment process.

The UNSDI Architecture suggests that UNSDI Partners organize themselves as a group to engage in many facets of the UNSDI Project. UNSDI Partners are organizations that extend support to specific UNSDI Deliverables in collaboration with UN Agencies that lead these activities. They may be responsible for global, regional or national SDI projects such as GEOSS and INSPIRE and are willing to share lessons learned and their resources with UNSDI actors such as the GSDI Association. The *UNSDI Partners' Group* may include *UNSDI Donors*.

UNSDI Donors are likely to be Member States, regional organizations, technology companies, international organizations and others who commit funds for the implementation of specific UNSDI deliverables or for the management of the overall UNSDI Project. Donors who provide funds earmarked for specific UNSDI deliverables that are lead by UN agencies, programmes and funds will interact with these organizations directly, whereas Donors who fund the UNSDI Technical Governance deliverable will channel their funds through an UNGIWG Member or UNOPS[2] for UNSDI Project Team staffing and *UNSDI Project* administration.

The UNSDI Project will be activated with the signing of the UNSDI *Memorandum of Understanding* (MoU) by one or more sponsoring UNGIWG Members which are called *UNSDI Participating Agencies*. In addition to establishing the terms of engagement among UNSDI Participating Agencies on the UNSDI Project and the responsibilities of the project administrator, the UNSDI MoU will inform the rules of engagement between lead UN organizations responsible for UNSDI deliverables and their non-UN partners.

5 UNSDI Technical Governance and Project Management

5.1 UNSDI Technical Governance

The development of the UNSDI technical governance regime is a UNSDI Core deliverable that will span over multiple phases of UNSDI implementation and is arguably the most significant "value added" of the UNSDI Project in the long term. The technical governance deliverable for UNSDI Phase One implementation is titled "Standards and Best Practices for Provisioning Core Geo-datasets." The objective of the Phase One technical governance deliverable is not the building of the UNSDI Core Geo-datasets *per se* but is the establishment of the agreements for the selection, specification and provisioning of the UNSDI Core Geo-datasets. In other words, it recognizes that effective technical governance establishes the agreements between producers and consumers of UNSDI Core geo-datasets whereby the provider can plan and resource delivery and a user will make the business decision to use that data directly or indirectly rather than maintain a separate dataset; thus fulfilling one of the promises of a Spatial Data Infrastructure (SDI): "build once, re-use many times."

The issues that affect such business decisions are many. Effective technical governance which involves the publication of a set of descriptive elements for each aspect of data provisioning, such as metadata profiles, access arrangements, data sharing policies that ensure protection of confidentiality, privacy and sensitive data in

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[2] UNOPS' services are being recommended if an appropriate UNGIWG Member is not prepared to administer the UNSDI Project.

general, accuracy standards, data models, feedback mechanisms, etc. facilitate mutually reinforcing harmonious decisions that establish and sustain SDIs. Only when a new arrangement is required will this set of options be extended by mutual agreement of the community of providers and consumers. In this way a (UN)SDI can avoid the unmanageable complexity of per-instance ad-hoc descriptions which prove to be incomplete, untrustworthy and consequently un-reusable in practice. Paragraph 6.1 provides further detail of this technical governance deliverable for UNSDI Phase One.

5.2 Project Management

The UNSDI Project Team has two distinct yet interrelated project management responsibilities: i) Management of the UNSDI data-centric Core Deliverable (parag. 6.1), and ii) Coordination of the overall UNSDI Project Phase One implementation to ensure its cohesion - mostly through effective guidance on policy and standards as well as coordination among all UNSDI deliverables: Core, Thematic Geo-dataset and Capacity Building. The UNSDI Project Team constitutes the operational core of the UNSDI Project in general terms as well as in the sense that it is responsible for delivering the most critical component of the Project, the minimum technical governance regime that will characterize the project's true worth.

Once the UNSDI Project Team is established per the Project Timeline adopted by the UNSDI Steering Committee, the first and foremost responsibility of the Team is to:

- Assess the requirements of UN Agencies as they relate to UNSDI Deliverables;
- Assess the gaps in existing technologies and solutions implemented;
- Identify the most adapted solutions to fill gaps with particular emphasis on trends in technology and best practices (while ensuring that the governance is clearly separated from the system technology as the governance framework will in fact enable interoperability among and the transitions between technology paradigms);
- Identify resources available;
- Prioritize and identify key partnerships to fill the gaps.

As described under each UNSDI Deliverable title below, lead agencies responsible for UNSDI Deliverables will naturally engage in requirements definition and technology scan activities within their area of focus. The Project Team will make sure that these activities are coordinated across the UNSDI Project and that each UNSDI Deliverable conforms to an agreed set of minimum "requirements definition" and "technology scan" standards.

The UNSDI Project Team will undertake Secretariat functions including the development and implementation of the UNSDI communication strategy. The provision of administrative support to the UNSDI Steering Committee, TAG and the UNSDI Partners' Group as well as the UNGIWG Co-chairs which will entail the organization of standing and ad hoc meetings including the annual UNGIWG Plenary, consultative meetings and UNGIWG Member teleconferences. Participation in relevant SDI and geospatial information events for advocacy, public information and outreach purposes is among the Team's terms of reference.

The UNSDI Steering Committee supports resource mobilization for the implementation of Phase I UNSDI Core Deliverables. Mobilizing the resources needed to undertake the activities listed under the headings of Thematic Geo-dataset and Capacity Building is the responsibility of each lead agency although it is expected that the UNSDI Steering

Committee will extend its support for such efforts.

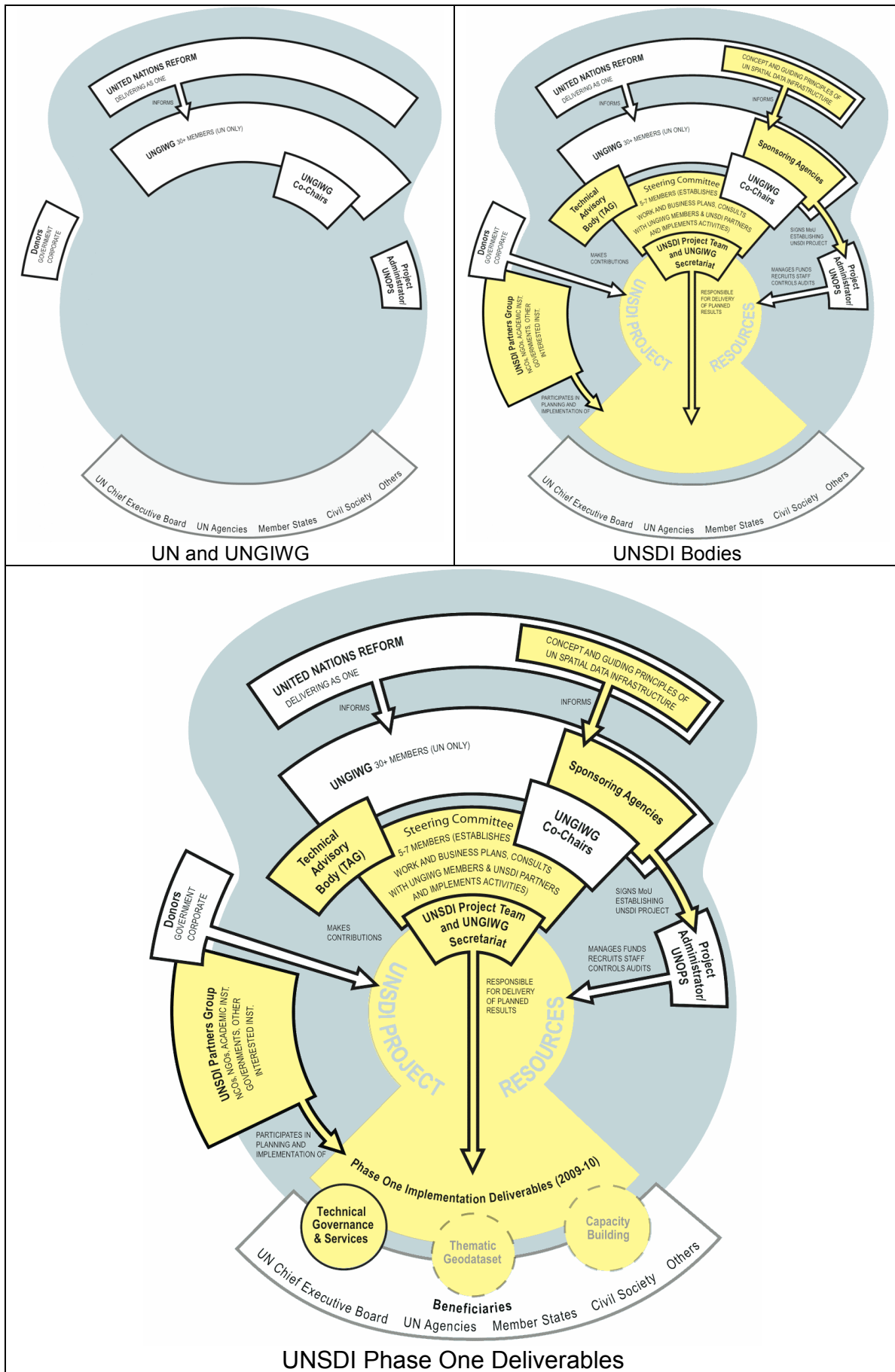| TITLE OF DELIVERABLE	LEAD AGENCY
UNSDI Core Deliverables	
Standards and best practices for provisioning UNSDI Core Geo-datasets	UNSDI Project Team
One Source Spatial Data Warehouse	FAO
One Source Visualization Facility	UNOG/ICTS
UNSDI Thematic Geo-datasets	
Human Health - Boundaries and Facilities Global Health Resources	WHO
Human Population - Centers and Distribution: Rural Demographics Map Series	FAO
Infrastructure - roads, railways, airports, harbors, and navigation: Global Transportation Database: UNSDI-T	WFP
Hydrology - drainage, water bodies: Global and Continental Standard Encoded Hydrologic Database	FAO
Global Land Cover Data	FAO
1:100.000 Scale Global and Continental Standard Encoded Coastline Database	FAO
Capacity Building	
Lesson Learned from Country Level Experience in Developing an NSDI with the Support of the UNSDI Community	UNECA
Open Source GIS on Data Grid	UNITAR-UNOSAT
E-learning curriculum outline - "Management of Spatial Information"	FAO
UN Regional Decision Support Service	UNEP
Coordination of National Focal Points in Data Preparedness for Disasters	UNOOSA/UN-SPIDER

Table 1. List of UNSDI Phase One Deliverables

Figure 1. UNSDI Architecture (V3.0, Dec. 2008)

6.   UNSDI Core Deliverables

UNSDI Core Deliverables consist of i) data-centric and ii) service-centric activities. The data-centric deliverable (parag. 6.1) sets the technical governance rules for the building and provisioning of UNSDI Core Geo-datasets. The service-centric deliverables (parag. 6.2) provide tools for the discovery, access and visualization of geospatial data assets both core and non-core. First set of Core Deliverable activities constitute a requirements analysis and technology scan exercise in conformance with the specifications adopted (parag. 5.2).

The major milestones of the UNSDI Project Core Deliverables and the dependencies among them are depicted in the UNSDI Project high-level work plan in Figure 2.
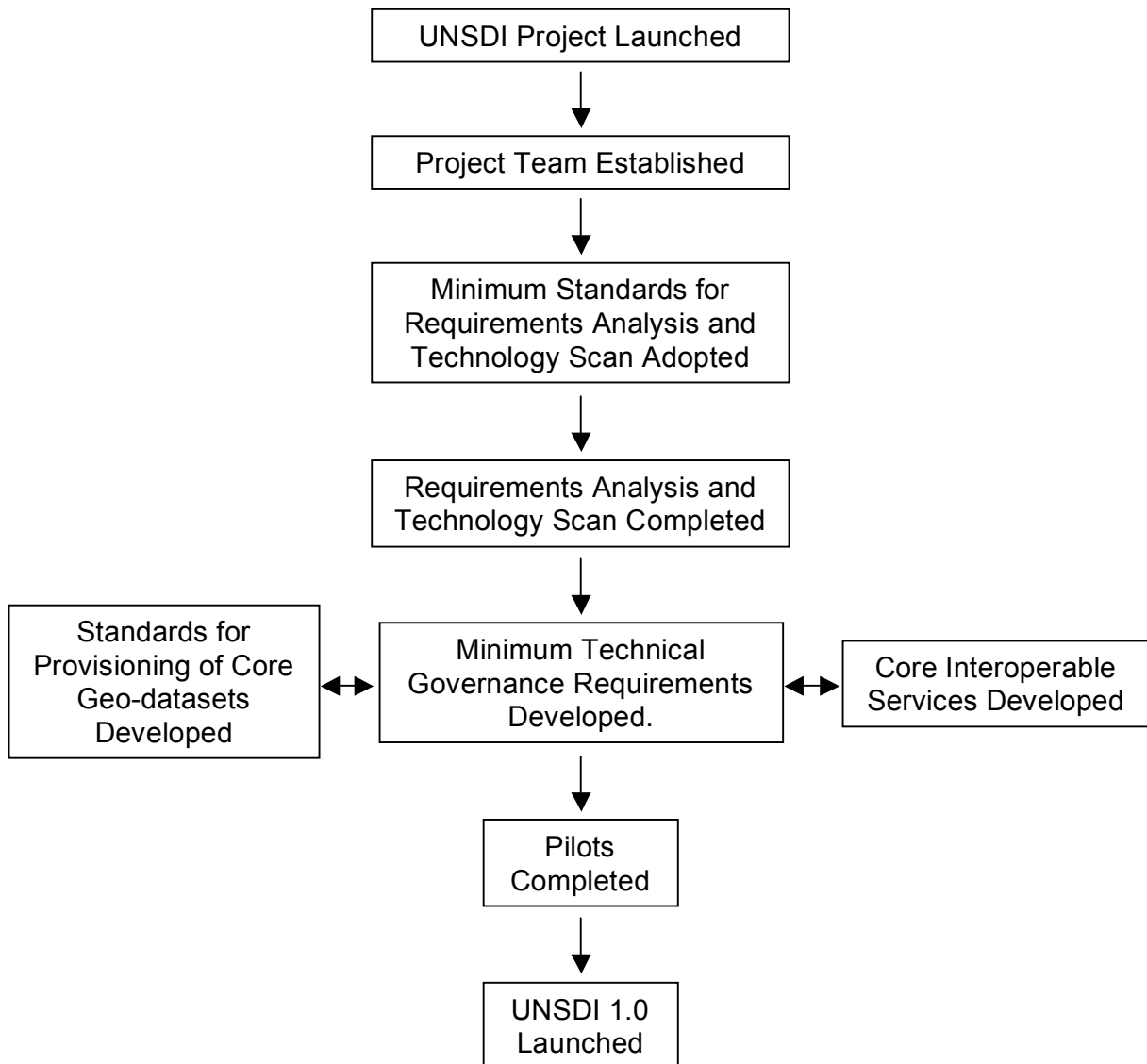
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                   │  UNSDI Project Launched  │
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                   │  Technology Scan Adopted │
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                   │  Technology Scan Completed│
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  │ Standards for│   │    Minimum Technical    │   │ Core Interoperable│
  │Provisioning of Core│◄─►│Governance Requirements│◄─►│Services Developed │
  │  Geo-datasets│   │       Developed.        │   │                  │
  │   Developed  │   └─────────────────────────┘   └──────────────────┘
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                          │   UNSDI 1.0  │
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Figure 2. UNSDI Project major milestones and high-level work plan.

6.1 Standards and Best Practices for Provisioning Core Geo-datasets

Name of lead UN body
UN Project Team (administered and sponsored by an UNGIWG Member)

Purpose and Scope
The development of the overarching minimum technical governance required to develop UNSDI Core Geo-datasets according to agreed standards and best practice will be the primary output of this activity towards the establishing of UNSDI 1.0 Specifications.

Core datasets, initially strengthened through the work of the UNGIWG "Task Group on Core Datasets" will benefit from the sustained technical governance support that can be provided through a dedicated project work plan. Technical governance outputs will include the publication of a set of descriptive elements for each aspect of data provisioning (data policy and access arrangements, metadata profiles, data models accuracy standards and feedback mechanisms) and will build upon existing policies and practices that need improvement or standardization (e.g. the UNSDI-T transport data model, the Second Administrative Level Boundary data set project). Informed through such global and regional initiatives as GEOSS and INSPIRE, and underpinned by effective consultative processes among the UNGIWG Membership, UNSDI technical governance will facilitate consensus and agreement for standards improvement and adoption within the UN System.

The Standards and Best Practices for Provisioning Core Geo-datasets Deliverable will inform the implementation of the "One Source Spatial Data Warehouse" and the "One Source Visualization Facility," the service-centric UNSDI Core Deliverables.

Major work plan milestones

i) Discovery and Planning: An inventory of existing geospatial data provisioning practices and plans is conducted among UNGIWG Members with due emphasis on data policy and access arrangements, metadata profiles, data models accuracy standards and feedback mechanisms. Interoperability standards (data and services) for each priority global UNSDI Core Geo-datasets are reviewed and adopted. A standard practice for the identification of priority global UNSDI Core geo-datasets to foster interoperability is established.

ii) Pilot and Evaluation: Priority global UNSDI Core Geo-datasets are identified. The first set of UNSDI Core Geo-datasets that already exist are compiled and posted on One Source Spatial Data Warehouse. Applicable technical governance rules are implemented in the One Source Visualization Facility.

iii) Full Implementation: All UNSDI Core Geo-datasets that already exist or have been produced by UN Agencies or their partners since the inception of the UNSDI Project populate the One Source Spatial Data Warehouse with custodianship fully practices by UNSDI entities responsible for each authoritative dataset. Promulgation of technical governance standards is fully enforced by all components of the UNSDI Project. UNSDI strategic communications plan is developed and implementation begun to raise awareness and support for UNSDI Data Provisioning Standards within the UN System.

Partners (current and potential)

UNGIWG Members, GSDI Association, GEO Secretariat (GEOSS), INSPIRE, ISCGM,

PCGIAP, PCIDEA, CODIST, OGC, ISO, donors, engaged Member States agencies, NGOs and geospatial technology corporations.

6.2   Interoperable Geospatial Services

The "One Source Spatial Data Warehouse" and the "One Source Visualization Facility" are the two service-centric UNSDI Core Deliverables. In full conformance with the standards set by the data-centric UNSDI Core Deliverable (parag. 6.1), these "One Source" Deliverables will underpin the One Source UN Portal initiative. One Source UN Portal is one of the information communication technology (ICT) projects endorsed by the High Level Committee on Management (HLCM) Steering Committee on Harmonization of Business Practices.

The UNSDI Interoperable Geospatial Services project proposals have been developed in close consultation with the focal point of the One Source UN Portal project and speak directly to the concerns of UN Reform. Figure 3 (and the Use Case in Annex C) depicts the interconnections among the One Source UN Portal, the One Source Spatial Data Warehouse and the One Source Visualization Facility, the last two being the UNSDI Deliverables described in the sections below
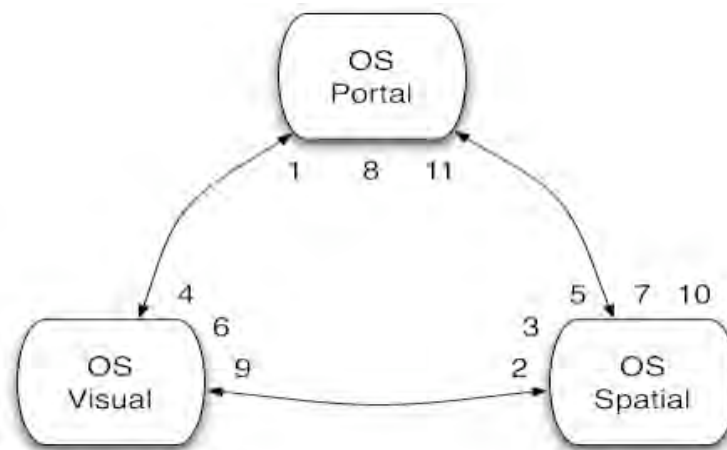

Figure 3: Interactions between One Source Visualization Facility (OSV), One Source Spatial Data Warehouse (OSS) and One Source Portal (OSP)

6.2.1 One Source Spatial Data Warehouse

Name of lead UN body

FAO

Purpose and scope

The One Source Spatial Data Warehouse will not only strengthen the reach of the network of geospatial information management nodes already in existence at a number of UN agencies, funds and programmes but extend the network further by the establishment of new nodes building on standardized spatial data-sharing practices and software that supports open standards, and in complementarity to the One Source UN Portal and the One Source Visualization Facility. It will add value to agency-produced or procured geospatial content such as maps, Geographic Information System (GIS) data, remote sensing imagery, Global Navigation Satellite System (GNSS) data logs, and other geo-referenced information by formally describing these resources using the UN

Geographic Information Working Group Metadata Profile, thus making them discoverable, accessible and re-usable.

The One Source Spatial Data Warehouse will mainstream and further advance best practices that have already emerged from the UN System, including FAO's Environmental Assessment and Management Service (NRCE) Geospatial Data Portal (http://www.fao.org/geonetwork), WFP's Vulnerability Analysis and Mapping Spatial Information Environment (http://vam.wfp.org/vamsie/srv/en/main.home), UNEP's ecoMundus for environment data and information (http://www.ecomundus.net/).

The effort will result in the establishment of new and upgraded geospatial information management network nodes at participating UN organizations and the strengthening of the associated community of practice within the UN based on the needs identified, priorities established for meeting them with the resources mobilized.

Major work plan milestones

i) Discovery and Planning: Analyse a subset of UN organizations active in geospatial information management and an established core capability to provide a reference point against which others could assess the capabilities, operational requirements and programmatic implications of their own participation. Take inventory of UN's existing geospatial data assets and produce a requirements analysis document based on consultation with interested stakeholders leading to a more precise determination of the resources required.

ii) Pilot and Evaluation: Based on the results of the requirements analysis, conduct an assessment of existing technologies with priority given to free and open source software solutions as required by UN Secretariat's guidance note on acquisition of new technologies. Upgrade, build and/or bid-buy the spatial data warehouse solution(s).

iii) Full Implementation: Introduce the adopted solution(s) at target UN Agencies, Funds or Programmes to harmonize UN's geospatial information management practices and to further advance best practices. Launch the public outreach and user training program in alignment with the UNSDI communication strategy developed by the UNSDI Project Team.

Potential partners

WFP, UNEP, WHO, UNHCR, UNICEF, UNITAR-UNOSAT, UNDP, UN Map Library, UNSD, UNOOSA/UN-SPIDER, IAEA and geospatial technology companies and others.

6.2.2 One Source Visualization Facility

Name of lead UN body

UNOG/ICTS

Purpose and scope

The One Source Visualization Facility will complement and strengthen the One Source UN Portal by providing one view of UN System information. It will be an alternative means of navigating UN System content on the One Source UN Portal platform. It is through this facility that agency-procured content (such as thematic reports and statistics) will be inter-linked at regional, country and sub-country geographic levels on one presentation platform. Analytical and navigation options will permit highly visual, drill-down and cross-sectional views of related information, facilitating the identification of new relationships in disparate data sources, previously denied in absence of any

collective publishing and presentation platform.

The Visualization Facility will achieve operational efficiencies by allowing the producers of the content to use a single data upload facility which will walk them through a process that will geo-reference the content if not already location-tagged, make them aware of the data sharing policies supported and help them decide which visualization platforms they want to publish their content on. Moreover, the Visualization Facility will save each content provider from the necessity to negotiate a separate agreement anew with the owner of each publishing platform by negotiating blanket agreements for the UN in advance when possible. The candidate visualization platforms are Google Earth/Maps, Microsoft Virtual Earth, NASA World Wind, Yahoo Maps, BirdEye-enabled applications (UNOG/ICTS) and others which use Open Geospatial Consortium (OGC) Web Services and related standards. Content will include annual statistical reports (e.g. human development, health and trade, drug control, humanitarian response, etc.) as well as thematically and geographically related website resources of various content types, including events, vacancies and news alerts.

Major work plan milestones

i)   Discovery and Planning: Analyse subset of UN organizations active in visualization and possessing an established core capability to provide a reference point against which others can assess the capabilities, operational requirements and programmatic implications of their own participation. This phase will conclude with the production of a requirement analysis and technology assessment report per the standards adopted (parag. 5.2), in consultation with interested stakeholders leading to a more precise determination of the resources required.

ii) Pilot and Evaluation: Based on the results of the requirements analysis, conduct an assessment of existing technologies with priority given to free and open source software solutions as required by UN Secretariat's guidance note on acquisition of new technologies. Upgrade, build and/or bid-buy the spatial data warehouse solution(s). Introduce content from organizations helping refine publishing processes as well as testing the ability to relate an extended range of subjects and content types. Develop blanket agreements with proprietary visualization platform technology organizations.

iii) Full Implementation: Transition from the expanded showcase to the broad introduction of the solution UN System-wide. Launch the public outreach and user training program in alignment with the UNSDI communication strategy developed by the UNSDI Project Team.

UNOG/ICTS will be the lead for this project with assistance obtained from UN Agencies and their partners who have experience in addressing security, non-disclosure, confidentiality, usage and intellectual property concerns as well as public-private partnership arrangements. UNSDI Project Team will assist UNOG/CAVA in outreach, training and first level technical support activities, including ongoing user requirements analysis throughout the service life cycle of the Facility as needed. CEB Secretariat will exercise oversight, ensuring coordination with related HLCM Business Practices.

Potential partners

UN Agencies with visualization capacities, Virtual Earth technology corporations and organizations (Google, Microsoft, Yahoo, NASA, etc.). Open Geospatial Consortium, Institute for Information and Communication Technologies (IICT, Switzerland), Joint

Research Centre (JRC, Italy), Information Technology for Humanitarian Assistance, Cooperation and Action (ITHACA, Italy), Mapufacture (USA), UN Agencies and their partners who have and/or are in the process of developing data policies.

Annex A: Thematic Core Datasets

A.1 General Presentation

Thematic data sets are manifold. Each UN Agency holds such data sets that relate to its specific mandate. With the development and implementation of UNSDI it is expected that each agency adapts its data set to the standards and procedures which comply with UNSDI 1.0 Specifications. The responsibility to align an agency's data set to UNSDI standards rests entirely with that particular agency. The agencies which have announced that they wish to embark on thematic core dataset development activities that strive to conform to UNSDI Specifications are WHO, FAO, and UNJLC/Logistics Cluster.

A.2 Description of Activities by Output

A.2.1 Human Health - Boundaries and Facilities Global Health Resources

Name of lead UN body

WHO

Purpose and scope

Provide a globally comprehensive geographic layer consisting of:

  a. Public health resources (health facilities, laboratories and other public health resources);

  b. Public health districts.

Relevance to other UN Agencies and initiatives

The use of a standardized health facility and administrative health layer by UN Agencies and major partners will ensure that data, particularly as it relates to heath, will be compatible across different providers. Additionally, in the case of major humanitarian events, the availability of a global health facility database will allow different agencies to better target interventions and activities.

Major work plan milestones

  i) Cleaning and improvement of the existing health facility and health district layer currently maintained by WHO;

  ii) Matching of this layer to other products, such as the 1:1,000,000 scale boundary map;

  iii) Provision of this layer to partner UNSDI members via Web services and other standards-based formats.

Potential partners

  • Public Health Resources: UNICEF, WFP, OCHA and NGO partners such as MSF, national Ministries of Health;

  • Health district boundaries: SALB, FAO and UNCS ministries of Health;

  • Global health information: UNCS, UNICEF, UNJLC, UNECA, and ICAO (particularly as they related to IHR 2005 implementation).

A.2.2 Human Population - Centers and Distribution: Rural Demographics Map Series; Mapped Associations between Urban and Rural Population Distributions and Other Environmental and Socio-economic Indicators

Name of lead UN body

FAO

Purpose and scope

To refine the urban and rural population maps developed by FAO from Landscan data and generate a set of data layers and map products that show where concentrations of rural people exhibit vulnerabilities that merit policy attention in support of poverty mapping and alleviation.

Relevance to other UN Agencies and initiatives

Highly relevant for all UN Agencies and other stakeholders concerned with development of and monitoring progress toward achievement of MDGs, Agenda 21 and UNFCCC adaptation and mitigation commitments.

Major work plan milestones

i) Population datasets have been updated to 2005;

ii) Methodology for evaluation of impact of urban population growth on land use patterns, and implications for climate change impact assessments, has been prepared for peer-reviewed publication;

iii) Series of 30-arc-second global maps have been generated for rural populations showing, e.g., degree of malnutrition, degree of market access, degree of agro-environmental vulnerability, degree of exposure to climate change risk;

iv) Evaluation workshop has been held, looking at utility of products generated to date, and work programme for further developing the rural demographics map series has been agreed;

v) Agreed work programme is implemented.

Potential partners

Interdisciplinary working groups within FAO.

A.2.3 Infrastructure - roads, railways, airports, harbors, and navigation: Global Transportation Database: UNSDI-T

Name of lead UN body

WFP (as the Head of the Logistic Cluster)

Purpose and scope

To compile an operational scale database (at least 1:200,000) of global transportation infrastructure (roads, ports, aerodromes, navigable waterways, etc). Sources of data are existing datasets harvested from cooperating agencies, governments, private sector organizations, and data collection missions during emergencies to which the Logistics

Cluster is deployed.

Relevance to other UN Agencies and initiatives

Direct impact on humanitarian operations or other efforts requiring maps with more detail than typical country or continent level maps.

Major work plan milestones

    i)   Collaboration with WFP to collect existing field datasets begins*;*

    ii) UNSDI-T Version x.0 published*;*

    iii) CIESIN CO-DATA working group target for publishing Africa roads;

    iv) Integration of all available datasets and publishing to the humanitarian community.

Potential partners

Any organization with a field presence (NGOs, UN Agencies, etc), Open Street Maps, National Governments, Navteq, WFP and ITHACA (for hosting the data).

A.2.4 Hydrology - drainage, water bodies: Global and Continental Standard Encoded Hydrologic Database

Name of lead UN body

FAO

Purpose and scope

Inventory of and provide access to standard encoded global and continental hydrologic databases in support of environment and development programmes.

Relevance to other UN Agencies and initiatives

Key database for all agencies and partners working in environment, development and emergency mitigation and response (FAO, UNEP, WMO, UNESCO, GTOS, GCOS, WWF, multi and bilateral aid agencies).

Major work plan milestones

    i)   Basic processing & harmonization

    ii) Connectivity & naming of river networks

    iii) Processing of watersheds, related data, & encoding

Potential partners

FAO (various Services), UNCS. Partners to be identified and selected.

A.2.5 Global Land Cover Data

Name of lead UN body

FAO

Purpose and scope

Development and implementation of a fully harmonized approach to make accessible reliable and comparable baseline land cover data and derived thematic information products required by national, regional and global stakeholders. Development of an agreed methodology of land cover change assessment and rapid means of its update.

Relevance to other UN Agencies and initiatives

Develops a suite of applications and methodologies which are combined with capacity building programmes to generate and make accessible land cover products which can be used for areas such as management of natural resources, humanitarian programmes, environmental protection, food security and climate change assessment, mitigation and adaptation.

Major work plan milestones

    i)   Develop a new version of the Land Cover Classification System (LCCS) plus applications domains;

    ii) Undergo the process to have LCCS prepared as an international standard through the International Organization for Standardization (ISO);

    iii) Develop and maintain a registry of classifiers on land cover for the UN and compliant with ISO;

    iv) Develop a new harmonized global land cover product based on International standards at a resolution of 300m;

    v) Implement a land cover mapping and environmental database development on the regional scale for two additional areas based on the integrated use of high spatial resolution optical and advanced radar (SAR) and support national activities when possible.

Potential partners

United Nations Environment Programme (UNEP), Istituto Agronomico per l'Oltremare (IAO), Global Terrestrial Observing System (GTOS), Global Land Cover Network (GLCN), ESA, CGIAR - International Center for Integrated Mountain Development (ICIMOD) and national mapping institutions.

A.2.6 1:100.000 Scale Global and Continental Standard Encoded Coastline Database

Name of lead UN body

FAO

Purpose and scope

Inventory and provision of access to standard encoded global and continental coastline databases in support of environment and development programmes, using the FAO mangroves coastlines database.

Relevance to other UN Agencies and initiatives

This is considered a key database for all UN Agencies and partners working in environment and emergency mitigation and response (FAO, UNEP, WMO, UNESCO,

GTOS, GCOS, multi- and bilateral aid agencies). It is an essential requisite for other global databases such as SALB and GAUL.

<u>Major work plan milestones</u>

- Assessment of existing coastline databases
- Filling gaps
- Assembling coastline data

<u>Potential partners:</u>

FAO (various Services), UNCS, WHO and other partners to be identified and selected.

Annex B: Capacity Building

Institutional and technical capacity building is an important activity undertaken by the various UN Agencies in the areas of their mandates and expertise. The main beneficiaries of capacity building are institutions in developing nations and their stakeholder communities. In order to promote and enhance within and between country cooperation on data access and sharing there might be a need to provide UN support in the area of geospatial data and information management. However, it is acknowledged that at this early stage of UNSDI development and implementation capacity building is not an immediate core activity of the UNSDI project approach. Capacity building activities will be undertaken as the need arises, in line with the development priorities of Member States in cooperation with Regional Economic Commissions and other stakeholder groups including NGOs. Individual UNGIWG Members engaged in institutional and technical capacity building will ensure that all activities are integrated, as appropriate, with the relevant United Nations Development Assistance Framework (UNDAF) and Poverty Reduction Strategy Papers (PRSP) at the national level.

B.1   General Presentation

The UNSDI Capacity Building approach addresses needs at the country and UN levels. Although a needs assessment has not yet been undertaken, in terms of indigenous capacity building at country level, it is envisaged that by the end of 2010 the following actions might happen:

1. NSDI and UNSDI activities in countries are coordinated between UN Country Team, government, academia, private sector and NGOs to ensure efficiency and sustainability and the UN capacity to convene and coordinate is used as a means of adding profile to the national SDI efforts;

2. Agreed upon information management standards and protocols are in place and applied by the different stakeholders to ensure data compatibility and tools interoperability between the different sectors;

3. The necessary IT infrastructure is in place to allow the transfer of the data from the country to the UN and vice-versa;

4. Opportunities for knowledge and skills development are made available for information professionals through electronic media including digital repositories, electronic communities of practice, and e-learning;

5. Capacity is built among donors (bilateral and multi-lateral) to incorporate SDI-type considerations into the vetting and revision of funding proposals.

In terms of capacity building within the UN, the following outcomes should be achievable:

1. The UNSDI core data sets, tools and interoperability standards are recognized and their application endorsed at management level;

2. Capacities are in place in each UN Agency in terms of metadata catalogue (standardized training material and implementation capacity);

3. Common training basis for rapid assessment is accessible to all agencies and countries;

4. The UNSDI community can access an inventory of skills and training

opportunities, and can make available its resources in electronic format in commonly accessible repositories, including e-learning for professional development;

5. The UN data policy capacity in terms of copyright, intellectual property and digital rights management is built and managed.

In countries, the activities proposed in this deliverable are aiming at:

1. Strengthening, recognizing and testing the UNSDI National Coordination Office (NCO) concept in several countries, making sure to link establishment of NCOs in developing countries to the establishment and/or strengthening of an NSDI;

2. Raising awareness of UNSDI with public servants, decision makers in order to enable better governance on local, regional and country level, providing synergy with e-government programmes and governmental actions towards sustainable development;

3. Documenting the lessons learned in such a way that they can serve as examples for other countries;

4. Making UNSDI materials (lessons learned and UNSDI toolkit) accessible at the country level and allow the countries to have the opportunity to contribute to this material;

5. Having the capacity, e.g. through multi-bilateral aid programmes, to bring UNSDI expertise to the countries;

6. Engage the relevant private sector to improve the IT infrastructure, including internet bandwidth and other issues related to the digital divide;

7. Facilitate and promote south-south collaboration, the development of electronic communities of practice and address the multilingual issue;

8. Provide access to training, e-learning and other capacity building materials for use by information professionals through common repositories.

The following are also an integral part of the UNSDI Capacity Building efforts:

1. Raising awareness and advocacy of UNSDI with UN senior management including a forward looking UNSDI advocacy and communication plan;

2. Engaging with UN partners on issues such as national and regional geospatial data policies;

3. Providing expert advice to agencies willing to embark on the UNSDI process by building their "MySDIs."

Some of these activities might be addressed by one of the other UNSDI Deliverables. The present deliverable is therefore trying to address the gaps, particularly on the institutional aspects.

All the above mentioned activities aim at facilitating communication and working relationships between UN and Member State stakeholders, avoiding duplication of efforts and a better use of available resources, ensure knowledge transfer as well as providing materials to fill the gaps in current NSDI capacities. All these should increase efficiency and reduce costs within the UNSDI community.

UNGIWG Members who plan to engage in capacity building activities are UNECA, UNITAR-UNOSAT, FAO, UNEP and UNOOSA/UN-SPIDER.

B.2   Description of Activities by Output

B.2.1   Indigenous Capacity Building (Country Level)

B.2.1.1 *Lesson Learned from Country Level Experience in Developing an NSDI with the Support of the UNSDI Community*

Title

Lessons learned from the established UNSDI-NCOs in The Netherlands, Spain, Hungary and the Czech Republic, and National Spatial Data Infrastructure (NSDI) initiatives in Zambia, Malawi, Pakistan and Afghanistan.

Name of lead UN body

UNECA

Purpose and scope

The purpose of this deliverable is to look at demands for improved geospatial information to feed problem solving processes in several countries and how the strengthening of the NSDI process in developing countries through the introduction and integration of the UNSDI-NCO concept could help spatial information providers respond to this demand in a sustainable and cost-effective manner.

Relevance to other UN Agencies and initiatives

The availability of a documented and analysed country level process for establishing an NSDI, including the technical, financial and institutional aspects that would not only have been facilitated by a UN Agency but also benefited from a broad spectrum of UN expertise could serve as a basis for other UNSDI-based capacity building exercises to take place in countries. This exercise should also facilitate resource mobilization for UNSDI based capacity building in countries as donors are asking for this type of integrated approach.

In order to finalize a document which will be useful to countries by the end of 2009, pilot exercises would be implemented in up to six countries that would involve:

- Travel: UNSDI country missions;
- Meetings: In country meetings/workshops;
- SDI specific training: e.g. metadata standards and templates; other GIS tools;
- Development of communication material and deployment of hardware and software.

Major work plan milestones

i)   Identification of the stakeholder and SDI process(es) already in place in the selected countries;

ii) Assessment of the capacities, working relationship and of the political environment in these countries;

iii) Based on the assessment, decision with the stakeholders in each country on the appropriate approach to be followed in order to initiate, support or strengthen the NSDI process;

    iv) Implementation of the selected approach and lessons learned.

Potential partners

 FAO, WHO, UN-ECA; UNSDI-NCOs and other stakeholders.

B.2.1.2 Open Source GIS on Data Grid

Name of lead UN body

UNITAR-UNOSAT

Purpose and scope

To build Open Source GIS inside Data Grid for access to GIS software, high processing power and large data storage by users in particular working in developing countries. Access to powerful GIS tools will be available from any Internet browser. GRASS Open Source GIS modules have been demonstrated to work on Data Grid. This deliverable will integrate the various GRASS modules on the Data Grid and develop a user-friendly interface. This would bring GIS tools to a global audience without the need for purchasing licenses, powerful PCs or large-volume hard drives.

Relevance to other UN Agencies and initiatives

Deliverable will bridge the GIS digital divide - highly relevant to users in developing countries.

Major work plan milestones

    i)   Integrate GRASS on Data Grid at CERN;

    ii) User testing by African students;

    iii) Evaluation of use and further developments.

Potential partners

UNOOSA/UN-SPIDER, CERN, FAO, UNEP, national entities and others.

B.2.1.3 E-learning curriculum outline - "Management of Spatial Information"

Name of lead UN body

FAO

Purpose and scope

To develop an e-learning curriculum on Management of Spatial Information. The curriculum should be targeted at spatial information professionals at country level and cover a series of interrelated major topics as follows:

- An overview of Spatial Data Management Systems;
- Spatial Data Concepts and Models;
- Acquiring, Creating and Linking Geo-referenced data;
- Data Organisation and Management;
- Metadata, meta-databases and interoperability;

- Outputs - Data Presentation, Analysis and Map Production;
- Publishing Data on the Web;
- Integrated Dataset Management Solutions;
- Case Studies / Application Projects.

Relevance to other UN Agencies and initiatives

Deliverable will outline the basic competencies and skills required by spatial information professionals at country level.

Major work plan milestones

i) 3-day Consultative Workshop to design, review and revise the proposed e-learning curriculum;

ii) Identified sources of existing training materials, methodologies and software tools relevant to the curriculum;

iii) Identification of subject experts and institutions to provide content and resources;

iv) Approved e-learning curriculum with costing for consideration for further funding.

Potential partners

FAO, UNEP, UNU and UNOOSA/UN-SPIDER

B.2.2   UN Capacity Building

B.2.2.1 UN Regional Decision Support Service

Name of lead UN body

UNEP

Purpose and scope

Implement a regional alerts and decision support capacity serving UN Agencies, programmes and partners. Also support to slow-onset crises especially driven by environmental consequences of climate change.

Relevance to other UN Agencies and initiatives

FAO, UNHCR, WFP and OCHA (and their partners') operations in the region. Builds on existing SDI-East Africa (SDI-EA) community. Builds on the capacities being built at the Regional Remote Sensing Centre (RCMRD) by NASA and US Department of State.

Major work plan milestones

i.   Community requirements specification workshops convened by SDI-EA – food security, humanitarian response, disaster response, climate change adaptation;

ii.   UNEP GEAS implementation approved;

iii.   RCMRD capacity building kicked off;

iv.   Decision support use cases developed;

v.   NASA services operational at RCMRD;

vi.   CATHALAC modelling services available to RCMRD;

vii. Decision support packages operational.

Potential partners

FAO (esp. SWALIM), WHO, UNITAR-UNOSAT, UNOOSA/UN-SPIDER, UNHCR, WFP, DEPHA, ICRC, CARE, CGIAR (ILRI, ICRAF, ICRISAT at least), NASA (USA), CATHALAC (Panama), bilateral and multi-lateral donors, NGOs.

B.2.2.2 Coordination of National Focal Points in Data Preparedness for Disasters

Name of lead UN body

United Nations Office for Outer Space Affairs (UNOOSA)/UN-SPIDER.

Purpose and scope

To identify relevant key datasets useful for disaster management in countries not already assessed by UN OCHA through its Country Level Minimum Common Operational Dataset activity. The data should be available to relevant UN Agencies and initiatives at all times or alternatively be made accessible and available in times of disasters or complex emergencies.

The deliverable will contribute to the core datasets by identifying possible datasets, working with UN-SPIDER national focal points as well as the network of regional support offices and making agreements to have the data available if not for initial compilation and subsequently updates of the database at least to support a specific need when required.

Additionally, in a medium-term UN-SPIDER will engage its network of regional support offices in the compilation and, when needed, development of vulnerability maps (regional and national).

Relevance to other UN Agencies and initiatives

OCHA, ISDR, DPKO, WFP, UN-HABITAT, UNU-IEHS, GEO, WFP, UNITAR-UNOSAT, Sentinel Asia, SERVIR (CATHALAC.

Existing UN-SPIDER resources will be utilized including UN-SPIDER staff distributed in the offices in Bonn, Beijing and Vienna. It is assumed that the geospatial datasets are already readily available or that their compilation and maintenance are funded through other sources. Vulnerability maps will be developed, when not available, by the network of regional support offices.

Major work plan milestones

The deliverable will be provided as part of the UN-SPIDER programme for 2009 (see A/AC.105/893, A/AC.105/894), in particular under the following UN-SPIDER activities:

i) Ensuring that relevant information is easily accessible and disseminated to all interested end-users on a "24/7" basis (24 hours a day, 7 days a week);

ii) Regional and country profiles (including vulnerability maps);

iii) Platform for Fostering Alliances focusing also on the definition of user needs, identifying data and ensuring accessibility (particularly through GEO Task DI-06-09 which is co-chaired by UNOOSA);

iv) Support to national activities.
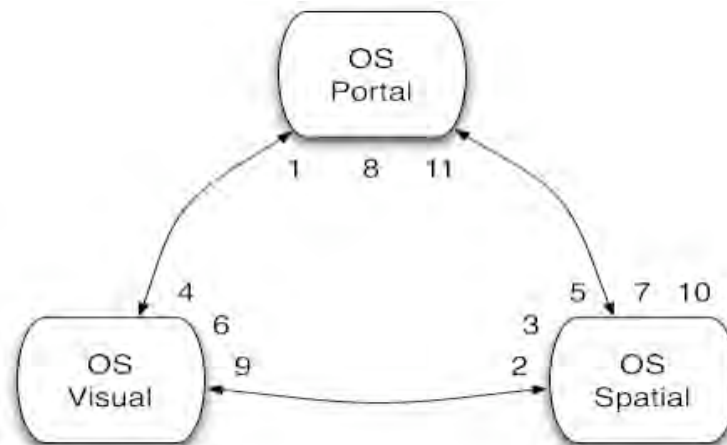
Potential partners

UN-SPIDER national focal points, UN-SPIDER network of regional support offices, UNDP, WFP, UNITAR-UNOSAT, DPKO, ECA, ESCAP, World Bank, OAS, IDB and others.

B.3   Project Management for Capacity Building

The project management capacity of the UNSDI Project Team will not be sufficient to organize and support UNSDI capacity building activities as per Annex B of the document. Even though capacity building will also take place in a modular and decentralized manner it would require its own coordination and management capacities.

Depending on which capacity building activities are required (and funded) first, a support mechanism will be defined. However, it is assumed that a minimum of administration and coordination will be required for that purpose.

Annex C: A Use Case Depicting Interaction among One Source Services

Interactions between One Source Visualization Facility (OSV), One Source Spatial Data Warehouse (OSS) and One Source Portal (OSP)

- User discovers OSP's service to assist UN Agencies with the publication of their geospatial data on virtual earth portrayal services and decides to use the service to create a thematic map with operational (new) data.

- Interactions among the user and the three One Source services:
1. User inputs/uploads the data set or points the data feed (from his own or outside source) to OSP for visualization and describes it as necessary;
2. The data (set/feed) and the description (metadata) are recorded in OSS (thus recorded in the UNSDI registry);
3. OSS publishes the data to OSV using the appropriate OGC service;
4. User interacts with OSV to operate on the data per the work flow defined by OSV;
5. OSS records process metadata and the resultant data/service;
6. OSV calls on OSS to publish the processed data (and other data resources including styling and map symbol libraries) for presentation on OSP;
7. OSS publishes the resultant data/services to OSP;
8. OSP calls on OSV to portray the data and handle user interactions with the display;
9. OSV logs all user interactions and reports final usage metrics to OSS;
10. OSS adjusts rating statistics for all data/services used for monitoring and evaluation including for "point of truth rating" purposes;
11. OSP exposes, in addition to all metadata fields, the ratings and indicators on the data and services built during the session to support discovery by users who have the commensurate authorization levels.

Annex D: Ninth UNGIWG Plenary Resolution (Nov. 2008)

RESOLUTION BY THE 9TH PLENARY MEETING OF

THE UNITED NATIONS GEOGRAPHIC INFORMATION WORKING GROUP

IN SUPPORT OF THE DEVELOPMENT OF

A UNITED NATIONS SPATIAL DATA INFRASTRUCTURE (UNSDI)

The 9th Plenary Meeting of the United Nations Geographic Information Working Group

INTRODUCTION

Whereas the United Nations Geographic Information Working Group (UNGIWG) brings together the Geographic Information Systems (GIS) specialists and cartographers of all UN agencies, funds, and programmes; and

Whereas since 2000 UNGIWG has been able to facilitate inter-agency co-operation and co-ordination on specific issues in the fields of cartography and geographic information science and promote the use of geographic information within the United Nations System; and

Reaffirming that at its 7th Plenary Meeting, UNGIWG endorsed a strategic vision for a United Nations Spatial Data Infrastructure (UNSDI) as a comprehensive, decentralized geospatial information framework that facilitates decision-making at various levels by enabling access, retrieval and dissemination of geospatial data and information in a rapid and secure way; and

Emphasizing the decisions of the 8th UNGIWG Plenary Meeting to implement a UNSDI on a project basis, built around deliverables, and allowing for the involvement of non-UN partners and Member States in the achievement of these deliverables; and

Recalling the efforts of the United Nations System to enhance its coherence, effectiveness and efficiency as laid out in its Reform Agenda;

Welcoming the work which has been done by the UNGIWG Co-chairs and the Secretariat of the United Nations System Chief Executives Board (CEB) to anchor the UNSDI initiative firmly in the UN Reform Agenda and to ensure that UNSDI is complimentary with other initiatives geared at enhancing system coherence and harmonization of business practices; and

Noting with satisfaction the substantive increase in support to UNGIWG and to the UNSDI initiative by a permanent Secretariat maintained by the Co-chairs in 2007 and 2008;

DECISIONS
- *Agrees* that the Interim Framework Document, with the modifications as contained in the Report of the 9th Plenary Meeting of UNGIWG, is the basis for the first phases of UNGIWG's continued effort to establish a United Nations Spatial Data Infrastructure (UNSDI) initiative; and *further requests* the Secretariat of UNGIWG to establish a consultation mechanism for its rapid endorsement before the handover of Chairmanship of UNGIWG (2009-2010 biennium); and once the Interim Framework Document is endorsed;

- *Invites* members of the United Nations Geographic Information Working Group to sign the Memorandum of Understanding establishing the UNSDI Project and to work actively towards its implementation; and

- *Requests* the incoming Co-chairs of UNGIWG to work during their tenure of office with all UNGIWG members on the implementation of the first phases of the UNSDI Project; and

- *Recommends* that they mobilize resources to maintain a standing Secretariat during their term as Co-chairs; and

- *Invites* partners of the United Nations Geographic Information Working Group to support the efforts of establishing a UNSDI by joining in the attainment of those deliverables which are of interest and to which they can contribute successfully; and

- *Encourages* interested governments of Member States of the United Nations to support the establishment of a UNSDI actively by providing expertise and advice, as well as human and financial resources; and

- *Calls upon* all members of the United Nations Geographic Information Working Group to take responsibility for establishing the UNSDI initiative by supporting the incoming Co-chairs and by taking over functions within its governance structure; and

- *Proposes* to the incoming UNGIWG Co-chairs to consult with Member States and to seek endorsement of the UNSDI initiative; and

- *Supports* the idea to review the progress of the UNSDI Project annually by members of the United Nations Geographic Information Working Group.

Vienna, 7 November 2008

Annex E: Selected UNSDI Business Cases

Global Assessments
The UN System as a whole produces many regular global assessment reports in areas as diverse as environment, governance and corruption, agriculture, forests, drug control, health, social and economic development. The nature of these reports is becoming increasingly crosscutting and integrated. Developing these reports requires data and information - often with geospatial characteristics - sourced from numerous UN agencies and programmes and their partners. In every case and with every reiteration of each report, these information items have to identified, located, sourced, acquired, harmonized, combined, aggregated and analyzed in a completely manual manner under the conditions of newly-negotiated or re-negotiated agreements. Having the necessary data and information items regularly updated and available through on-line services using standard delivery mechanisms operating according to standard, standing 'boilerplate' agreements constituting the UNSDI will reduce the overheads associated with each of these reporting processes.

Disaster Preparedness and Humanitarian Response
Effective geographic information management is at the core of disaster management. Recent emergencies such as the Indian Ocean Tsunami, Pakistan Earthquake, Myanmar Cyclone Nargis, floods in Africa and Latin America as well as conflicts in the Middle East and Georgia have clearly illustrated the need for proper geographic baseline information as well as damage assessments to be strongly coupled to the overall coordination and assistance provided by international and national actors. Geographic Information System data are routinely provided by entities such as OCHA, UNJLC, UNHCR, WHO, UNITAR-UNOSAT and WFP. Though recent developments in geographic data sharing systems facilitate easier access to data by various actors, allowing for updated data to be automatically disseminated through standard protocols for maximum benefit of UN sister agencies, IFRC, ICRC, NGOs and national organizations, the information bases available for planning and executing these responses varies widely in timeliness, accuracy and completeness, derived from information sources across the spectrum from phoned-in estimates to field reports to in situ measuring equipment to satellite images. Consequently, achieving and maintaining a complete and accurate picture remains a challenge. An operational UNSDI would increase the ability for operators to assess the risk to the operations by being able to readily aggregate, compare and portray the best available data rapidly and repeatedly.

Climate Change
Worldwide systematic observation of the climate system is essential for advancing scientific knowledge on climate change and towards fulfilling the objectives of the United Nations Framework Convention on Climate Change (UNFCCC). The Global Terrestrial Observing System (GTOS) is supporting its Sponsors (FAO, UNEP, WMO, UNESCO, ICSU) and the broader stakeholder community to address issues of climate change and climate variability, especially in regard to its effects on food security, the environment and sustainable development. The GTOS Secretariat, with the assistance of its Panels, is supporting the observational requirements of the UNFCCC by developing possible mechanisms for a terrestrial framework and assisting in the implementation of the 13 terrestrial Essential Climate Variables (ECVs), including the assessment of the status of available standards.

Addressing current gaps in satellite and especially in situ observations and efforts to harmonize consistent data sets towards what can be called a Climate Change Adaptation Spatial Data Infrastructure (SDI) provide the multi-user community with high quality information required for effective monitoring of climate change. As a "system of systems" and an interoperability framework for thematic SDIs, UNSDI has the potential to allow cross-domain leveraging of climate change information by other domain experts (e.g. disaster management, public health, human rights, etc.).

<ins>UN Country Team - Delivering as One</ins>
UN Geographic Information Working Group (UNGIWG) members, including the World Bank, have different levels of presence in a large number of countries around the world. These organizations, alone or in coordination with other UN Country Team members, are beginning to take advantage of geo-information tools to organize and visualize their activities to manage their operations and to coordinate their efforts with operating partners and their host nation counterparts. For instance, the UN Assistance Mission in Afghanistan (UNAMA) engaged in a project to produce a map depicting collective activities of the Afghanistan UN Country Team members to provide an overarching view of their efforts highlighting gaps and overlaps in all domains of activity - from disaster management to development assistance, from environmental protection to drug control, from peace and security to shelter, public health and education. The UN Spatial Data Infrastructure (UNSDI) initiative has the potential to contribute to this project as well as similar other UN Country Team efforts elsewhere by providing a framework where it is not only a map which is the ultimate deliverable of these projects, but Internet/network-based "data services" enable UN organization and their close partners to subscribe to most authoritative map layers such as administrative boundaries and a gazetteer of settlements and landmarks. Country Team members can use this service to geo-reference and visualize their aggregated operational data for the benefit of other Team members, Resident/Humanitarian Coordinators, donors, operating partners and host governments while enjoying the privilege of mapping the information at all scales suitable for internal reporting, monitoring and evaluation purposes.

As a "delivering as one" enabler, the UNSDI Project promises to deliver a geo-information architecture and a technical and institutional governance framework scaleable for each geographic level (HQ/global to regional, national, provincial and local) in the service of facilitating the fulfilment of UN's many mandates.

Annex F: List of Acronyms

CAVA	Centre for Advanced Visual Analytics
CEB	UN System Chief Executives Board
CERN	European Organization for Nuclear Research (Organisation européenne pour la recherche nucléaire)
CITO	Chief Information Technology Officer
CODATA	Committee on Data for Science and Technology
DPKO	Department of Peacekeeping Operations
ECOSOC	United Nations Economic and Social Council
FAO	Food and Agriculture Organization of the UN
GA	General Assembly
GAUL	Global Administrative Unit Layers
GEO	Group on Earth Observations
GIS	Geographical Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSDI	Global Spatial Infrastructure Association
HLCM	High Level Committee on Management
IAEA	International Atomic Energy Agency
ICAO	International Civil Aviation Organization
ICSU	International Council of Scientific Unions
ICT	Information and Communication Technologies
ICTS	Information and Communication Technology Services
ISO	International Organization for Standardization
ITHACA	Information Technology for Humanitarian Assistance, Cooperation and Action
MoU	Memorandum of Understanding
NGO	Non Governmental Organization
OGC	Open Geospatial Consortium
OSM	Open Street Map
SALB	Second Administrative Level Boundaries
SDI	Spatial Data Infrastructure
TAG	UNSDI Technical Advisory Group
TG	Task Group
TOR	Terms of Reference
UN	United Nations
UNDFS/CS	United Nations Department of Field Support/ Cartographic Section
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNGIWG	United Nations Geospatial Information Working Group
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UNJLC	United Nations Joint Logistics Centre
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
UNODC	United Nations Office on Drugs and Crime

UNOG	United Nations Office in Geneva
UNOOSA	United Nations Office for Outer Space Affairs
UNOPS	United Nations Office for Project Services
UNOSAT	UNITAR Operational Satellite Applications Programme
UNSD	United Nations Statistics Division
UNSDI	United Nations Spatial Data Infrastructure
UNSDI-T	United Nations Spatial Data Infrastructure on Transportation
UNSDI-NCO	UNSDI National Coordination Offices
UN-SPIDER	United Nations Platform for Space-based Information for Disaster Management
WFP	United Nations World Food Programme
WHO	United Nations World Heath Organization
WMO	World Meteorological Organization