UNGIWG Task Group 3
Interoperable Services

November 2007 Progress Report

Objectives

The Interoperability Services Task Group works on improving access to and interactive use of spatial data to enhance data sharing and support decision-making through international standards and specifications.

Task Group Membership

FAO and UNEP where nominated to manage Task Group 4 at the 5th Plenary Meeting in Geneva. Currently the TG membership, as known to the mailing list, stands as:

- Jeroen Ticheler (FAO) -TG Manager
- Mick Wilson (UNEP) –TG Manager
- Michelle Anthony (USGS)
- Paul Bellanger (UN-ECA)
- Olivier Cottray (WFP)
- Thomas Gurtner (Centre for Development and Environment, Uni. Of Bern)
- Ian May (UNEP/World Conservation Monitoring Centre)
- Katherine O'Neill (WHO)
- Jean-Pierre Pacquette (IAEA)

Activity of the formal members has been low. However, as was highlighted at UNGIWG-7, significant activity occurred and progress made through collaboration with interested parties outside TG-3.

List of Tasks

1. Geonetwork opensource
2. UNSDI-Transport
3. SDI-East Africa
4. Regional Consultation on Governance of the UNSDI
5. ISO 19115 UN Profile Formalization
6. Components Registry
7. GEOSS Portal Showcase participation
8. SDI-in-a-Box
9. Support to UNGIWG Task Groups

Tasks 2, 3 and 4 are subjects of separate reports and will be summarized here.

Tasks 5 and 6 have made no reportable progress since UNGIWG-7

Task 7

Task 8 is an *ad hoc* activity not planned at UNGIWG-7 that has arisen through recent discussion between UNEP and Microsoft.

Task 9 arises from requests received from TG-2 and TG-5 since UNGIG-7

1 GeoNetwork opensource & GeoServer

Over the last year, the GeoNetwork opensource project has made significant progress resulting in the

release of a new version of the software as the climax in September 2007 and a Third GeoNetwork Workshop held in Rome in November 2007.

The progress has taken place in roughly three areas:

- Developer and user community
- New software release
- Incubation process of GeoNetwork opensource as a top level project of the Open Geospatial Foundation (OSGeo.org).

1.1 Some highlights from the developer and user community

The number of users and developers of the software have both doubled over the last year. We can now count three new developers on the project that are external to FAO's core development team. We have also seen a doubling of the number of subscribers to the public user and developer oriented mailing lists. This has brought about a much higher email traffic on those lists.

The number of software downloads per month reached an all-time high in October 2007 with close to 1400 downloads.

Software testing has seen a much higher number of bug reports and fixes compared to any previous release. This is a sign of a growing number of users that take the time to evaluate and test the early releases of the software and are willing to provide feedback.

Several of the UN agencies have begun upgrading their GeoNetwork based nodes to the latest version.

1.2 Some of the highlights of the new GeoNetwork opensource release

During the past one and a half year, the GeoNetwork team has made substantial improvements to the application. Many of these changes followed out of the workplan developed at the second GeoNetwork workshop, while a range of additional improvements came out of the recommendations of two user requirement studies performed among FAO and OCHA staff and included consultations with the wider UN and GeoNetwork user community.

- The catalog now provides 6 different server protocols that can be used to connect and search a catalog. It can also act as a client through 5 different communication protocols. The client protocols make it easy to harvest metadata from other (distributed) catalogs so they can be searched locally. The server protocols allow different desktop or web based client applications to search GeoNetwork databases according to protocols they may already support.

- Most of the graphical user interface has been redesigned and made more interactive through AJAX techniques. The web map client (InterMap) has been integrated in the catalog homepage and has seen many improvements. A user can now export maps in the form of a PDF or send a self made map combination by email for others to reopen. These projects can also be stored on the PC to be reopened again later.
- The catalogue now supports the final version of the ISO 19115 metadata standard released in 2003 with an XML encoding that follows the ISO 19139 implementation standard. All of this is complex but required for full ISO 19115 metadata compliance.
- The help system provides direct mouse over access to many functions, including all metadata elements.
- GeoServer, a map server that supports among others the OGC WMS, WFS and WCS services (see http://www.opengeospatial.org for details on those services), has been embedded in the GeoNetwork opensource release. This provides users with an instantly accessible map server that they can use to serve their spatial data through the internet as interactive maps. Further integration work is currently worked on to facilitate this process even more.

A full list of improvements can be found at http://geonetwork-opensource.org

1.3 Some highlights of the incubation process

The GeoNetwork opensource software is going through the process of incubation to become part of the independent Open Source Geospatial Foundation (OSGeo.org). OSGeo is a foundation that aims at bringing together first class geospatial open source software and promote its use and sustainable development. To ensure open source software projects are sustainable, each software product is required to pass an incubation process.

GeoNetwork is close to completing the incubation process. EXPECTED WHEN

A full code review on Intellectual Property right and proper license references in the code was done as well as a review to ensure all incorporated Libraries use a compliant open source license to the one used by GeoNetwork (GNU-GPL).

Most of the applications used by the project are now running on OSGeo infrastructure.

During the third GeoNetwork workshop a Project Steering Committee (PSC) was established. the PSC deals with the day to day project management. Proposals for change to the project have to be submitted by developers and will require a positive vote by the PSC before it is added to the GeoNetwork core. A release strategy has also been agreed upon to make releases more predictable and stable.

2 UN Spatial Data Infrastructure - Transport - V1.2

2.1 Background.

UNGIWG 6th annual plenary (Addis Ababa in October 2005) agreed that UNGIWG member organizations work towards developing a UN Spatial Data Infrastructure (UNSDI) comprising data and metadata standards, data-sharing mechanisms and inter-operable geographic data repositories. In the context of this wider effort, the United Nations Joint Logistics Centre (UNJLC), a Humanitarian Common Services aimed at facilitating logistics coordination in complex emergencies, was tasked with developing a spatial data model for transport-related datasets.

The project, baptised UNSDI-T, aims to develop and implement a global transport and logistics geo-database schema tailored to humanitarian requirements along with a data collection and processing methodology by the end of 2007. Three broad issues are being addressed towards these objectives:

1. Semantics and terminology -information requirements of humanitarian logistics
2. Technical implementation -database modeling of transport and logistics features
3. Institutional adoption -generation of a critical mass of users and implementers

The UNSDI-T development process is benefiting from our partnership with ITHACA (Information Technology for Humanitarian Assistance, Cooperation and Action -www.ithaca.polito.it), who have been of great help implementing our logistics information requirements into the current structure. Real-time feedback was also acquired through field implementation in South Sudan and from a number of partner agencies, such as FAO-SWALIM who have adopted early UNSDI-T v.0 standards in their infrastructure mapping work.

2.2 UNSDI-T Terminology and database schemas.

2.2.1 Building the UNSDI-T terminology.

UNJLC establishes a first draft of the UNSDI-T terminology by (i) undertaking a desk review of best operational practices in Logistics Capacity Assessments (Operational and Academic sources); (ii) rationalizing attributes and values; and (iii) compiling a framework descriptive of a transportation system.

This first draft was then submitted for comments to a large audience of senior logisticians from various institutional bodies resulting into a strengthened framework which was then adopted as a de facto standard among this set of actors.

List of UNSDI-T contributors

- WFP (WFP Security, Air Ops, LCA Team, Ethiopia LCA Database, Land and Sea Transport,
- Global Logs Cluster Team
- WHO Logistics
- CILT-UK's HELP Forum (NGOs)
- NGO Logistics Officers (ACF (Fr) Logistics, MapAction,
- Economic Commission for Africa \ Transportation Infrastructure Master Plan for Africa

2.2.2 Designing the UNSDI-T data model and database schema.

Data model and database schema design were run parallel to the building of the terminology; both data model and database schema were meant to be system free allowing for technical interoperability.

First prototype versions were released by UNJLC in the view of facing the information requirements of an operational deployment (October 2006).

UNJLC implementing partner ITHACA (Information Technology for Humanitarian Assistance, Cooperation and Action) drew from these first beta versions to design a the Data Model and Database Schema for an Enterprise Geodatabase (May 2007).

2.3 Technical implementation.

2.3.1 Calendar of releases.

Each UNSDI-T release includes documentation (List of attributes and value domains), structure (Data Model), blank geodatabase template, assessment package.

All deliveries can be accessed at the following section of the UNJLC Web:

http://unjlc.org/mapcenter/unsdi/

October 2006 – May 2007: UNJLC UNSDI-T first prototypes.

May 2007: Version 0.

August 2007: Version 1.

2.3.2 Version 1 News.

Availability. Version 1.2 is currently available for download on the UNJLC \ UNSDI web.

Consolidating a global Transportation database: spatial data from UNJLC's past operations (Pakistan, Indian Ocean Tsunami, Lebanon, Liberia, Congo-RDC, Sudan, Uganda) were integrated in this version of the Geodatabase along with some global transportation datasets (mainly ADC roads and Global Discovery).

UNJLC is currently engaged with its network of partners to join forces in this database integration efforts. As an example, UNJLC is currently co-chairing with the CIESIN (Columbia University's Center for International Earth Science Information Network) the CODATA working group to produce a free global road dataset (1/200,000 scale).

Designing a web architecture for the UNSDI-T: it will allow for online access, editing, processing, analysis and web services (WMS, WFS and reports).

Achievements: (i) ORACLE implementation of the UNSDI-T Schema by ITHACA - UNJLC UNSDI-T implementing partner; (ii) Database hosting and associated web services under final tests, first releases by early December 2007.

Release a "light" version of the UNSDI-T version 1.2: UNJLC is working on this release to tie framework to the core information requirements of a deployment in an emergency context.

2.4 Institutional adoption.

2.4.1 Mandate:

UNJLC is leading the development of a UNSDI-T for the UN upon the request of UNGIWG and this role has been endorsed by its Interagency Steering Committee (October 2006) making UNJLC the custodian of logistics standards for the humanitarian community.

2.4.2 Advocacy and Training.

2.4.2.1 Conferences and workshops (since April-07)

UN Geographic Information Working Group annual meetings
- Frascati, March 2007
- Bangkok, November 2007

Global Roads Workshop- New York, October 2007

Inter-agency Information Management Working Group Geneva, July 2007

ESRI Annual User Conference - San Diego, June 2007

HUMLOG - Helsinki, May 2007

Chartered Institute for Logisticians and Transporters - London, April 2007

2.4.2.2 Mailing list, website and publications

unsdi-t@unjlc.org

www.unjlc.org/mapcenter/unsdi

Global Spatial Data Infrastructure newsletter (May 2007)

2.4.2.3 UNSDI-T-based GIS Capacity Building materials.

Three levels of training programs

1-day GPS data collection workshop (Field and HQ)
- Logistics Information Management principles
- GPS theory and practice
- Use of UNSDI-T data collection forms

3 to 4-day introductory GIS training for logisticians (HQ)
- Logistics Information Management principles
- GPS training and UNSDI-T data collection
- Introduction to GIS data manipulation and mapping

3-day UNJLC GIS SOPs for GIS Stand-by Partner staff (HQ)
- Training the trainers
- Management of UNSDI-T SOPs
- Coordinating data collection projects
- UNJLC standard GIS products

2.4.2.4 Adoption of the UNSDI-T standards and framework.

The UNSDI-T package will be used in operations by UNJLC and the UN Global Logistics Clusters. Other partners:

- FAO Somalia – road mapping project
- CartONG (Uganda) – road mapping project
- OCHA – transport components of global humanitarian base layers project
- CILT (UK) – aligning their work on humanitarian logistics standards with UNSDI-T
- Logistics Cluster/UNJLC operations
- ECA/TIMP – developing an Africa-wide transport database using the UNSDI-T standard
- CODATA Working Group UNJLC/ CIESIN: Global Roads database project.

2.4.3 Operational adoption:

The UNSDI-T has been used since October 2006 in UNJLC operations under different operational environments:

- **Sudan** (largest current and on-going UNJLC Operation) and

- **Uganda** (one month UNJLC/ Global Logistics cluster response to Northern Uganda Flooding).

3 SDI-East Africa

The concept of using East Africa as some sort of natural laboratory for SDI showcasing was mooted at UNGIWG-7 and received a significant boost at the UNGIWG Global Partners' Meeting.

SDI-East Africa (SDI-EA) was initiated in late March 2007. It is an exercise involving UN agencies and programmes operating in East Africa plus their partners amongst NGO, IGO, government and civil society. It is an unfunded activity intended to determine 1) how far can we go implementing SDI principles in the field? 2) the extent to which the political will exists to enable an effective community to develop 3) institutional and governance factors that must be accounted for in the operational design of any SDI and the UNSDI in particular.

3.1 Community and Capacity Building

A significant level of participation has been achieved in a relatively short time (as the table below demonstrates) across a broad range of sectors – humanitarian aid, emergency response, food security, environmental assessment, education, national development, and advocacy. The levels of participation range from actual operational implementation of open web services through participation in training and

	SDI-EA Participants and Observers		
	UN	**NGOs, IGOs, academia, inter-agency bodies and civil society**	**Government**
Participants	FAO/SWALIM GEMS/water UNDP (Somalia office) UNEP, UN-Habitat UNHCR (regional office and Somalia office) UNOCHA (regional office and Somalia office)	ACC, CGIS-NUR, CRADLE, DEPHA, Development Gateway Foundation, ICRAF, ILRI, Kenya Polytechnic University College, Makerere University (Ug), RCMRD	KNSDI
Observers	UN-Habitat	World Bank	DANIDA DRSRS EPA (Et) KWS Ministry of Lands (Ke, Tz) NEMA (Ke, Ug) NEMC (Tz) USAID

ACC – African Conservation Centre
CGIS-NUR - Centre for Geographic Information System of the National University of Rwanda
CRADLE - Centre for Research & Action on Developing Local Regions and the Environment
DEPHA – Data Exchange Platform for the Horn of Africa
DRSRS Department of Remote Sensing and Resource Survey (Ke)
EPA – Environment Protection Agency
GEMS – Global Environment Management System
ICRAF - International Centre for Research into Agro-Forestry
ILRI- International Livestock Research Institute
KNSDI – Kenyan National Spatial Data Infrastructure
KWS – Kenya Wildlife Service
NEMA – National Environment Management Authority
NEMC – National Environment Management Council
RCMRD – Regional Centre for Mapping for Resource Development
SWALIM – Somalia Water and Land Information Management project

hands-on capacity development exercises to watching (and sometimes participating in) mailing list discussions.

Training and capacity building exercises have delivered practical and repeatable skill development wherein participants leaving the session able to implement a full OWS toolkit enabling publication of spatial data to the internet, authoring of metadata, discovery of web-based data, delivery of data to desktop applications for analysis, and data visualization via map services. The current toolkit comprises java, tomcat, geoserver, Geonetwork, QGIS, uDIG, postgreSQL and postGIS. Training has been delivered by staff from UNEP, FAO/SWALIM and RCMRD.

Community building has built upon existing successes, particularly the SIMaC (Somalia Interagency Mapping and Coordination) , an active group of Somalia-related UN activities, NGOs and IGOs. SIMaC seems now to be undergoing transformation into a more informal regional group for coordinating and managing spatial data access, a transformation in part driven by the broader scope of interest in SDI-EA.

A number of governance issues have arisen during SDI-EA, most particularly the mismatch between headquarter network policy and field office requirements over security considerations, especially (but not limited to) regarding protection-related information on refugees and IDPs, both within and outside the UN. A second recurrent constraint is that many agencies see themselves as only data consumers, not publishers, or at least cannot afford to get into the publishing game, There is an obvious opportunity to demonstrate to managers the means by which generalized or sanitized data can be published for the purposes of coordination through SDI mechanisms without compromising security or mission focus. Upcoming showcases will focus on addressing these concerns.

Measures of success achieved during 2007 range across:

- the increased number of operational open web services (6)
- demonstrated integration of data of data from amongst these services, particularly UNHCR refugee camp locations meshed with OCHA regional flood rapid assessments Aug – Oct 2007 and FAO/SWALIM detailed flood assessments for Somalia, Uganda and Kenya
- demonstrating that even the limited telecommunication infrastructure in Kenya can support SDI open web service applications
- the number of hand-on training exercise (5) and the trainees now able to implement OWS (57)
- the instances of training participants who are now in the process of establishing operational services (2)

- the instances where trainees have in turn taken their new capabilities and passed them onto their partners (2)
- instances where trainees have recruited additional participants (many)
- instances where previously unpublished data have not only reached the internet but have done so using very effective visualization tools; UNHCR-Somalia's IDP movement animations covering 2006-07.

Future goals can include

- shifting current observer institutions to become operational, especially within the UN family, and building further UN participation especially with UNOSAT
- continuing the hands-on capacity development and passing this task to competent regional bodies
- increasing the scope of hands-on training and sophistication of service offerings e.g. image tiling
- exploring more dynamic, near-real-time data inclusion (such as from SWALIM networks of automated river and rainfall gauge stations) transaction web feature services, sensor-web and sensor alert systems
- presenting SDI showcases to senior policy and management figure in government, NGOs and IGOs in the region focusing on addressing concerns regarding security, propriety and expense of data publishing.
- continuing to explore ways of using on-line visualisation as a tool for raising managers' awareness of the value of their data

3.2 Other Outreach

3.2.1 Conferences and workshops (since March 2007)

SWALIM Remote Sensing Workshop, June 2007
Society for Conservation GIS – Nairobi, July 2007
Presentation to Environmental Science graduates, University of Nairobi, July 2007

3.2.2 Mailing lists and Web sites

Mailing lists sdi-ea@als.unep.org, sdi-ea-hackers@als.unep.org, sdi-ea-un@als.unep.org

Wikis sdi-ea@als.unep.org, sdi-live@als.unep.org

Blog sdi-ea@blogspot.com

4 Regional Consultation on the Governance of the UNSDI

UNEP and the Norwegian government sponsored a Regional Consultation on the Governance of the of the United Nations Spatial Data Infrastructure took place at the UNEP Headquarters in Nairobi on 24-25 June 2007. Forty-five participant were drawn from countries in East Africa (plus Nigeria) representing UN headquarters, regional and country office, plus non-governmental organizations, inter-governmental organizations, government departments, the private sector and academia with responsibilities in environmental management, food security, humanitarian aid, emergency response, national development and technology. A more complete report is presented elsewhere in the UNGIWG-8 agenda.

The theme of the consultation - "***Better Data Sooner"*** - intended to capture many notions but, most importantly, that it is only when data are *used* that they can be critically assessed and improved. SDIs can provide the opportunity of having many more eyes and brains contribute to improving their data. A truly functional SDI should provide a governance framework that enables feedback and constant quality improvement as a means to promoting production of better data, not just more data.

The Consultation built upon collaboration SDI-East Africa. Addressing the technical issues of interoperability in East Africa has exposed numerous governance and institutional impediments. The consultation was designed to further elaborate these constraints, to identify innovative means for addressing them, and to articulate the unique opportunities available to the UN system in helping to relieve the constraints.

The major purposes of the Consultation were to:

1. articulate the expectations and requirements that would be made by a representative cross-section

of the potential users of and contributors to a UNSDI, and to convey these to the UN Geographic Information Working Group for inclusion in Phase 2 of its implementation strategy during 2008-09;

2. identify specific policy, governance and capacity building aspects of UNSDI implementation that would best support and complement national, regional and sectoral SDIO developments by the UN's partners and constituents; and
3. recommend to UNEP/DEWA specific actions for using SDI to improve environmental inclusion in its 2008-09 programme of work in the context of implementing the Bali Strategic Plan for Technology Support and Capacity Building, of the ”One UN” pilot country activities, and the “One UN” activities

Some of the more specific objectives for the consultation included:

- defining the types of information products for each participating organization is responsible and modeling the supply chain by which each is created;
- identifying the common features about which virtually all organizations require information to create the context against which their specialized information provides unique insight and value; and
- identifying practical and effective means for using SDIs and modern visualization tools for improving communication with senior decision takers and policy setters.

The major outputs and results anticipated from the Consultation were:

1. a work plan framework supporting SDI developments in East Africa for implementation by DEWA in 2008-09;
2. one or more agreed scenarios for collaborative deployment as showcases using SDI to communicate policy-relevant messages to senior management and policy developers; and
3. the framework for an institutional architecture guidelines document to be produced and distributed by UNEP/DEWA to assist member states (and any other interested parties) to identify and address governance issues arising in the developing and implementing their own SDIs.

Key findings of the Consultation were that:

- there are already numerous drivers in the region that make the need for trans-boundary SDIs apparent, and that more drivers will arise as regionalization proceeds;
- governance issues are at least as great a constraint on SDI development in the region as technical ones;
- effective communication with senior decision makers is crucial to garnering political support for SDIs
- the UN system has many roles to play in fostering SDI development including providing operational examples, clarifying existing standards and guidelines and making them more accessible, acting as a convener for interested parties and communicating the principles and practices of sustainable information management to funding bodies.

Key recommendations of the Consultation were that:

- UN-based SDIs, while streamlining access to UN-held data, must provide channels through which member states, NGOs, IGOs and other programme partners are able to contribute data into the UN system;
- the UN formulate a non-binding statement of principles for participation in SDIs in which institutions would recognize their opportunities and obligations as contributors of data, services, methodologies, reference sources or expertise; and
- collaborators (including UN agencies) implement an SDI showcase to provide a vehicle for informing decision makers and prompting political support for SDIs.

5 ISO 19115 UN Profile Formalization

UNGIWG-7 agreed that TG-3 should proceed to develop a formal model the existing UN profile for ISO 19115 metadata standard. This work has not proceeded.

6 Components Registry

UNGIWG-7 agreed that TG-3 should derive componentized services from UNEP's existing GEO Data Portal (statistical charts, data extraction and abstraction). This work did not find funding but is included in the proposed programme of work for 2008-09.

7 GEOSS Portal Showcase

The Global Earth Observation System of Systems (GEOSS) has seen two proposals been put forward that are based on GeoNetwork opensource. An ESA/FAO carried proposal for a GeoPortal (http://www.geoportal.org) uses GeoNetwork opensource as it's back end server and Map Viewer front end. The GeoPortal prototype will be presented at the GEO Ministerial meeting help end of November in South Africa. An FGDC carried proposal for the GEOSS clearing house is also presented as one of the three candidate clearinghouse candidates for GEOSS, and is the only free and open source solution. Also this clearinghouse is based on the GeoNetwork opensource software.

8 SDI-in-a-Box

Negotiations between UNEP and Microsoft in early November included agreement that Microsoft would be willing to help build a “one-click” installation package (or, SDI-in-a-box) according to UN requirements. The outline specification includes java, tomcat, geoserver, Geonetwork, QGIS, uDIG, postgreSQL and postGIS. Decision to proceed is pending, at least in part the endorsement of UNGIWG.

9 Support to UNGIWG Task Groups

TG-3 has implemented wikis in response to requests from other UNGIWG task groups, namely TG-2 (Remote Sensing) and TG-5 (Map Production Guidelines). These use similar look and feel to the main UNGIWG website are operational at http://www.ungiwg.org/tg2 and http://www.ungiwg.org/tg4 respectively. Shells of wikis are setup but not operational for other TGs should they be wanted. There is an additional wiki set up for the ReliefWeb community as well.