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Case Studies

FAO GeoNetwork in a Multinational Development Programme

The Case of the Programme Against African Trypanosomiasis

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Abstract

The Programme Against African Trypanosomiasis[1] - Information System (PAAT-IS) is hosted by FAO and it produces, collates, stores, analyses, and disseminates information on tsetse, trypanosomiasis and related sustainable agriculture and rural development for the benefit of 37 trypanosomiasis affected countries of sub-Saharan Africa and of international FAO/PAAT partners. In 2006 PAAT-IS began to utilize the infrastructure and functionalities of FAO GeoNetwork to improve the dissemination of PAAT-IS spatial datasets, mainly small scale predictive distribution maps of different tsetse fly species, the vector of the disease. Standardized metadata were created and key GIS datasets made available on the FAO geospatial portal, thus complementing other existing dissemination channels and media (i.e. PAAT web site, CD-ROMs, FAO/PAAT statutory meetings). More recently, GeoNetwork was included in the agenda of PAAT training activities. In this context, selected PAAT partners from affected countries were trained on the basics of GeoNetwork to foster a more effective sharing and documentation of data in the context of ongoing multinational intervention projects. The potential of such a tool in the management of trypanosomiasis and other vector-borne and transboundary animal diseases is briefly discussed and progress and setbacks in its dissemination to PAAT partners in developing countries are outlined.

The Programme Against African Trypanosomiasis (PAAT)

Tsetse-transmitted trypanosomiasis (also called sleeping sickness in humans) is an infectious disease unique to Africa, caused by various species of trypanosomes. The disease affects both people and animals and occurs in 37 sub-Saharan countries covering more than 9 million km^2, an area which corresponds approximately to one-third of Africa's total land area. The infection threatens an estimated 60

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[1]PAAT is an international, inter-agency alliance aiming at harmonizing and coordinating the activities of the four mandated organizations (AU/IBAR, FAO, IAEA, WHO) in relation to tsetse-trypanosomiasis and related sustainable agriculture and rural development in affected areas of sub-Saharan Africa. (http://www.fao.org/ag/paat.html)

million people and about 50 million head of cattle.

PAAT is an international forum which guides and assists the trypanosomiasis affected countries in the development of policies and strategies aimed at the implementation of integrated interventions in identified priority areas. PAAT brings together international institutions [African Union (AU), Food and Agriculture Organization of the United Nations (FAO), International Atomic Energy Agency (IAEA) and World Health Organization (WHO)], other UN Agencies, international, regional and national research institutes, extension services and scientific and technical staff from affected countries.

PAAT - Information System (PAAT-IS) and the use of GIS datasets

PAAT-IS aims at generating, harmonizing and sharing technical and scientific information among PAAT partners and stakeholders. GIS datasets and tools constitute important components of PAAT-IS and more emphasis has been placed on them during the recent system upgrade.

Geospatial datasets are used in several phases of the tsetse and trypanosomiasis decision making process. Global datasets (i.e. continental level datasets) are used by international agencies and donors to identify priority areas of intervention in relation to feasibility and potential benefits of tsetse/trypanosomiasis control or elimination projects. Key datasets at the continental scale are the predicted distributions of tsetse species, maps of the agroecological potential and poverty maps. Higher resolution datasets, normally at the national or subnational level, are needed to plan, implement, monitor and evaluate interventions in the field. Typical spatial datasets used in this context are field-based entomological and parasitological data, land cover maps, digital elevation models and medium resolution satellite imagery (e.g. Landsat, Spot, etc.)

FAO GeoNetwork for PAAT-IS

FAO, hosting the PAAT-IS, utilized and promoted GeoNetwork opensource[2] among the partners and beneficiaries of the Programme. In a first phase, standardized metadata (ISO-19115) for key PAAT spatial datasets were created and posted on FAO GeoNetwork[3]. The first datasets to be uploaded were the

predicted distributions of tsetse fly, at 5 km resolution for the whole sub-Saharan Africa and at 1 km resolution for some priority areas of intervention. Figure 1 shows two of the PAAT-IS datasets now available through FAO GeoNetwork.

From an operational standpoint, the choice of an open source solution and of FAO GeoNetwork offered several advantages. By using FAO GeoNetwork, PAAT-IS did not need set up a new hardware and software infrastructure to target a large community of GIS data users. Access to the existing FAO platform was granted to PAAT-IS, which also benefited from technical assistance of FAO GeoNetwork staff on all matters related to the user interface and metadata creation. GeoNetwork administration functionalities allowed to create a new group of users labelled "PAAT-Information System", administered by the PAAT-IS manager. The latter was registered in the system with the privileges of "User administrator". This profile allows the PAAT-IS manager to create new users within their group; PAAT-IS users will be able to access dataset that may not be visible or downloadable for occasional (i.e. non-registered) users. This hierarchical policy of users' management allows to restrict access to sensitive information to a predefined group of authorized people. At the present stage, no visualization or downloading restriction is applied to PAAT-IS datasets in GeoNetwork, with the exception of test datasets or datasets "under development".

In a second phase, PAAT-IS introduced the usage of FAO GeoNetwork to key partners in trypanosomiasis affected countries, which have embarked on a tsetse-trypanosomiasis elimination initiative at continental level, the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC). PATTEC is structured on several national projects which are expected to address the transboundary nature of the problem in a coordinated manner. All national projects established GIS units to support entomological mapping, land use planning and strategic decision making. GeoNetwork opensource could play a role in storing, documenting and sharing the geospatial information in this type of multinational project. During an interactive training workshop held in Rome, three selected GIS specialists from Burkina Faso, Ghana and Uganda received training on several aspects of information management and GIS-based decision making, including GeoNetwork. They were provided with FAO GeoNetwork accounts as "Editors" within the PAAT-Information

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[2]GeoNetwork opensource: http://geonetwork-opensource.org
[3]FAO GeoNetwork: http://www.fao.org/geonetwork

Figure 1: Two sample datasets produced by PAAT and also available through FAO GeoNetwork.

System group, thus allowing them to create and upload their own test metadata. Feedback was positive and the potential of the tool was widely recognized. Still, in the aftermath of the workshop, the usage of the system failed to gain momentum and follow-up actions such as completion of test metadata and further dissemination lag behind. This can be ascribed to shortcomings in the management of the national projects in general, and of the information systems in particular. Further training and pro-active actions by FAO will probably be needed in this field for lasting assimilation of data sharing approaches to be achieved.

Interactive mapping in FAO GeoNetwork

In addition to the on-line publication of metadata and the download of GIS datasets, FAO GeoNetwork offers to authorized users the possibility to create Web Map Services (WMS), a standard of the Open Geospatial Consortium (OGC) which allows to visualize, overlay and query maps interactively, either through a GIS application or directly from the web browser (through InterMap[4], an interactive map viewer). The software used by FAO to create the WMS is MapServer[5].

PAAT-IS set up WMS for the land cover maps of eight trypanosomiasis-affected countries, all derived from the FAO Africover databases. The maps are tailored to tsetse habitat mapping and they were created through the process of thematic aggregation of the original full-resolution, multipurpose databases. Such a customization took advantage of the inherent flexibility of the Land Cover Classification System[6] (LCCS), upon which Africover maps are based.

The dissemination channel of Africover products is a dedicated web-site[7]; in particular, access to the full resolution datasets requires authorization from the National Focal Point Institutions. In addition to this preferential dissemination channel, an aggregated multipurpose version of Africover is available as WMS through FAO GeoNetwork. PAAT-IS followed this example to first introduce the technology of web map service to the tsetse and trypanosomi-

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[4]InterMap viewer: http://sourceforge.net/projects/intermap

[5]MapServer: http://mapserver.gis.umn.edu/

[6]Land Cover Classification System: http://www.glcn-lccs.org/

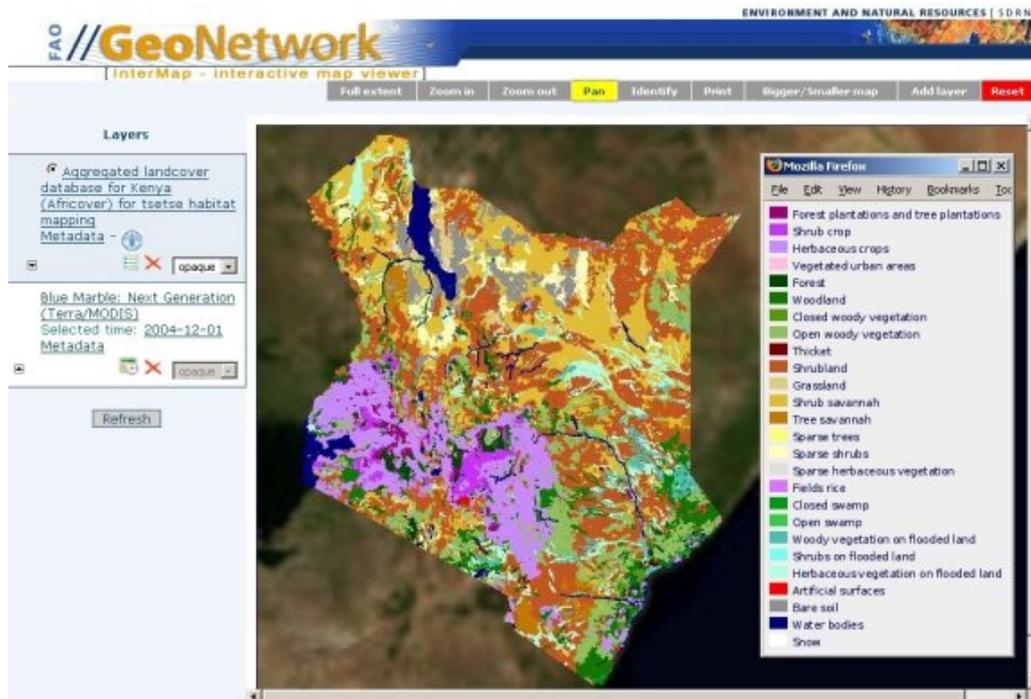[7]Africover: http://www.africover.org

Figure 2: Web Map Service of the land cover of Kenya customized for tsetse habitat mapping, visualized through the FAO GeoNetwork interactive map viewer "InterMap".

asis community. WMS is one of the most fundamental OGC's interoperability standards that PAAT can use to allow its partners to access datasets remotely through a variety of applications. PAAT partners could also use WMS to display datasets for which direct download might not be advisable. FAO GeoNetwork already provides a robust hardware and software infrastructure that, through the support of PAAT, could be used to these purposes.

More info

Programme Against African Trypanosomiasis: http://www.fao.org/ag/paat.html
PAAT - Information System: http://www.fao.org/ag/paat-is.html
FAO GeoNetwork: http://www.fao.org/geonetwork

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