

Zanzibar Land Administration and Revenue Generation System (Large) (4620)

Jukka NIEMINEN and Tuomo HEINONEN, Finland

Key words: land management, land registration, revenue generation, fiscal cadastre, GIS

SUMMARY

Zanzibar has taken its first steps towards a modern land management system and real property registration through the Government of Finland financed Sustainable Management of Land and Environment project (SMOLE I) during 2005-2009.

Zanzibar Multipurpose Cadastre (MPC) Pilot was built during 2007-2008 to enable several central and local government agencies to use this common GIS base. MPC Pilot has now been successfully tested in the Stone Town (UNESCO World Heritage Site) and during 2009 also in the immediate 13 neighboring shehias (smallest administrative area in the Government) of Zanzibar Municipal Council.

Government of Finland has approved a four year continuation for SMOLE for years 2010-2013 (SMOLE II). The tested methodology will now be replicated to cover all Zanzibar. In addition to land management components as systematic land registration the development of improved revenue collection component will be supported. This enables the Zanzibar Revenue Board to organize taxation of the privately owned properties and land lease collection of Government of Zanzibar owned parcels. In addition the GIS base can be used for the management of garbage collection and waste water fees collection by the Zanzibar Municipal Council. Thus a new approach (Land Administration and Revenue Generation – LARGE) has been initiated.

The main users of the LARGE application are: Department of Lands and Registration (DoLR) with Land Registrar's Office under it, and the Department of Surveys and Urban Planning (DoSUP) as "owners" of the key data and Zanzibar Municipal Council (ZMC), Zanzibar Revenue Board (ZRB), Stone Town Conservation and Development Authority (STCDA) as the main counterparties.

LARGE concept is considered as a successful example of carrying out simultaneous building and unit based data collection for the first time systematic land registration and for other needs of the society in the same process.

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1. INTRODUCTION TO ZANZIBAR

Zanzibar is an archipelago consisting of two main Islands, Unguja (commonly referred to as Zanzibar Island), and Pemba, as well as about 52 smaller islands.

The two sister main islands are located in the Indian Ocean about 35km off the coast of Mainland Tanzania at longitude 39 degrees East and latitude 6 degrees South of the Equator. The total area of Zanzibar is about 2644 square kilometres Pemba has an area of about 984 square kilometres and Unguja 1660 square kilometres. Zanzibar is part of the United Republic of Tanzania.

In 2002 the population of Zanzibar was of 981,754 with an annual growth rate of 3.1% (compared to 2.9% for the whole of Tanzania). The current population of Zanzibar is about 1,200,000 with the annual growth of 3.1%. The average population density is 400 people per square kilometer. More than 30% of the population lives in towns. This situation has made Zanzibar one of the densest populated countries in Africa, South of Sahara.



Figure 1 Tanzania and Zanzibar

According to 2002 census there is 2,500 m² available for each person, but by 2015, this drops to 1,760 m². A significant area has been taken for urban development, hence reducing the productive agricultural production in both Islands (Pemba and Unguja).

The growth of the economy, especially tourism, has resulted in increased demand for land for hotel and residential development, particularly along the coast. Most of this new demand comes from foreigners, including mainland Tanzanians; who do not have the right to own interests in land, only leases.

2. BACKGROUND OF THE FINNISH INVOLVEMENT IN LAND INFORMATION SYSTEM DEVELOPMENT

In 1984, Finland hosted the fourth Session of the Commission of Human Settlements. The session focused on the theme of land. Since then, Finland has actively supported United Nations Human Settlements Programme (UN-Habitat) in issues related to land and shelter. The UNCHS/GOF Support Programme for Preparing National Shelter Strategies was launched in 1987 and completed in 1991 with financial assistance provided by Finland amounting to FIM 19.8 million.

From 1988 to 1995, UN-Habitat developed a system for rapid planning of settlements, the Visual Settlement Planning Approach (ViSP) with the assistance from Finland and the Finnish Technical Research Centre (VTT).

Systematic Land Information Management (SLIM) approach was developed on the experiences gained through these previous programmes. By creating an improved GIS based system in addition to supporting planning activities SLIM could also be used for municipal revenue collection, land registration, building control, urban infrastructure development and, ultimately, improved local government performance. The first practical application based on SLIM Approach was successfully tested in Kanpur, India in 2000-2001 as part of Dutch Government financed Ganga Institutional and Community Development Project (ICDP2). As a result Kanpur City Corporation (KNN) started systematic property tax collection using GIS based system based on the SLIM principles. SLIM principles were also applied in Gaza, Palestine (Strengthening the Land Management System in the Palestinian Authority with a View to Facilitating Access to Housing 1998-2000) and in Ho Chi Minh City, Vietnam (Organization Development of the Ho Chi Minh City Land Administration, 2000).

In 1998, as a follow-up to the Habitat II Conference, an expert group meeting was jointly organized by United Nations Human Settlements Programme (UN-Habitat) and the Finnish Government in Turku, Finland. The meeting recognized the important role of local authorities in the provision of shelter for all and stressed the need for capacity building and technical training amongst key actors. The meeting noted that funds for technical support are inadequate and urged international donor agencies to facilitate capacity building at the local level. One of the key objectives of the SLIM approach is to enhance the capacity building through long-term on-the-job training of the local government staff.

The SLIM approach was further developed in the private sector in Finland and its application for local government revenue generation was planned through a concessional credit scheme to support six medium sized cities in the Philippines (Feasibility study for Capacity Building in Tax Mapping and Revenue Collection for Local Government Units, Philippines, 2003-2005). The Government of Finland appraised the scheme and approved the concessional credit, but the Philippines Government failed to give the state guarantee for the loan.

The SLIM principles have now been successfully implemented in Zanzibar as part of the Multipurpose Cadastre Pilot of the Sustainable Management of Land and Environment

SMOLE project (2005-2009). The tools have been refined, the GIS and database systems have been tailored to the Zanzibar context, and the local staff has been trained to operate and maintain the system components. As both land management and revenue generation components are now in use on the multiple GIS platform, the initiative has been renamed to Land Administration and Revenue Generation (LARGE) approach.

3. JUSTIFICATION FOR MULTIPURPOSE CADASTRE IN ZANZIBAR

During the development of the land policy (2006-2007) it became apparent that many of the problems relating to land could be solved by having land and buildings registered with the Land Registry. To bring land into registration it is first necessary to go through adjudication, a process in which land and properties are identified, rights claimed and determined (adjudicated).

Work with Stone Town Conservation and Development Authority (STCDA), Zanzibar Municipal Council (ZMC), and Zanzibar Revenue Board (ZRB) also identified that much of the revenue for these and other organizations is linked to the correct identification of property. It therefore follows that development of better land administration systems would allow the Land Registry to function efficiently, enhance the revenue earning capacity of organizations like ZRB, ZMC and STCDA, as well as provide information to improve other land based systems, such as conservation of the properties of the historically valuable Stone Town (UNSECO World Heritage Site), urban planning, and public utilities management.

The information needed by the Land Registry and other users is often very similar. Each user needs to know where the property is and the types of rights held and the holder of those rights. Naturally there are differences: Land Registry information is generally about property boundaries and the ownership of rights, while the other users are often more concerned about the occupant and the use to which property is put. But both sets of data are very closely related and there were compelling arguments for collecting them together.

The Sustainable Management of Land and Environment (SMOLE) Project's Steering Committee decided in September 2007 to implement a Multipurpose Cadastre (MPC) Pilot to test the technical and administrative possibilities to bring the key operators together and start using a GIS base for their various activities.

The MPC Pilot was to determine information on the costs, time required, and most appropriate methods of collecting land information for both adjudication (first registration) and other property related activities, such as use, occupancy and availability of utilities. The pilot was planned to be sufficiently large to provide statistically valid information, which could then be used to develop proposals which may be submitted to other donors to expand the Multipurpose Cadastre application to cover all urban areas in the future.

At the time of initial planning of MPC it was estimated that six to eight months would be needed to complete the fieldwork for the MPC Pilot project (3 data collection teams with 2

persons in each) in the Stone Town, which was agreed to be the first pilot area for the exercise.

4. SMOLE I MAPPING TO SUPPORT MULTI-PURPOSE CADASTRE PILOT

During SMOLE Preparatory Phase from September 2003 to April 2005 a detailed aerial photography was completed in scale 1:3,000 for the Stone Town (UNESCO World Heritage site area). Aerial photography covering a larger area (Stone Town and ZMC area) was flown into scale 1:8,000 at the same time. Still another aerial photography assignment was completed in March 2004 and March 2005 to cover all the land area of the islands in aerial photography scale 1:25,000. Thus Zanzibar has got an excellent base material that can be used for digital mapping, urban and regional planning, environmental management, public utilities management, and promotion of tourism activities.

These aerial photos were ortho-rectified and photo-mosaics were produced. The Zanzibari staff of Department of Surveys and Urban Planning (DoSUP) was trained to do the stereo work and digitizing of the map elements for the production of digital maps for the entire Zanzibar islands. The mapping exercise was completed in December 2009.

The digital maps are now ready for printing in any scale, including the scales identical to the earlier 1982 mapping – 1:10,000 for the entire territory of Zanzibar, and 1:2,500 for the urban areas of Unguja (Zanzibar Town, Nungwi) and Pemba (Mkoani, Chake Chake, and Wete).

The digital base map has served as a good platform for the GIS based Multipurpose Cadastre (adjudication, land registration, property valuation, land leases, taxation etc.), as well as for a multitude of other activities performed by other ministries, other donors, and academic institutions (Education, Health, Agriculture, Census enumeration area definition, etc.).

5. MULTIPURPOSE CADASTRE - DESCRIPTION

The Multipurpose Cadastre (MPC) is an integrated system for managing cadastral data. It combines geographic and non-geographic data and provides graphical presentations in form of maps.

The idea has been to use the cadastral data, cadastral map layers and MPC system's functionality for both cadastral and non-cadastral domain specific purposes. The latter category includes for example supporting revenue collection activities of municipal and governmental organizations. This can be achieved by expanding the database with non-cadastral data or by integrating the MPC with existing non-cadastral applications.

The MPC system is technically based on client-server and so called representational state transfer (REST) web services architecture. At present the clients are Access project front-ends, browsers or standalone ArcGIS 9.3. SQLServer 2005 is used as DBMS. Two application servers, GeoServer and MPCServer, run on Apache Tomcat.

The pilot information system was implemented for management of building data and parcel data created from the building footprints. The system contains the following main functions:

- Storage and maintenance of building related business data in relational database by using SQL Server and dedicated maintenance tools.
- Storage and maintenance of building footprint geometry in ESRI Personal Geodatabase by using ArcView 9.3 and tailored maintenance tools
- Integration between building geometry and related business data

Figure 2 describes the current setup of MPC core data. The actual work of data collection and validation has been organized as follows:

- Building and Unit inventory data was collected by the field teams and entered in the databases by the Recording Officers
- Field survey will be done to all those buildings that are new (i.e. do not appear in the original ortho-photo printout) or which appear to be faulty. This work will be done under the supervision of the Demarcation Officer after receiving a field investigation list from the field teams.
- On screen digitizing of all new buildings and corrections to the geometry of the faulty buildings will be done by the GIS Officer.
- The GIS Officer together with the Demarcation Officer will also complete the parcel formation before the actual adjudication will start.
- GIS Officer will make necessary modifications to the parcel boundaries as needed during the finalization of the adjudication process.

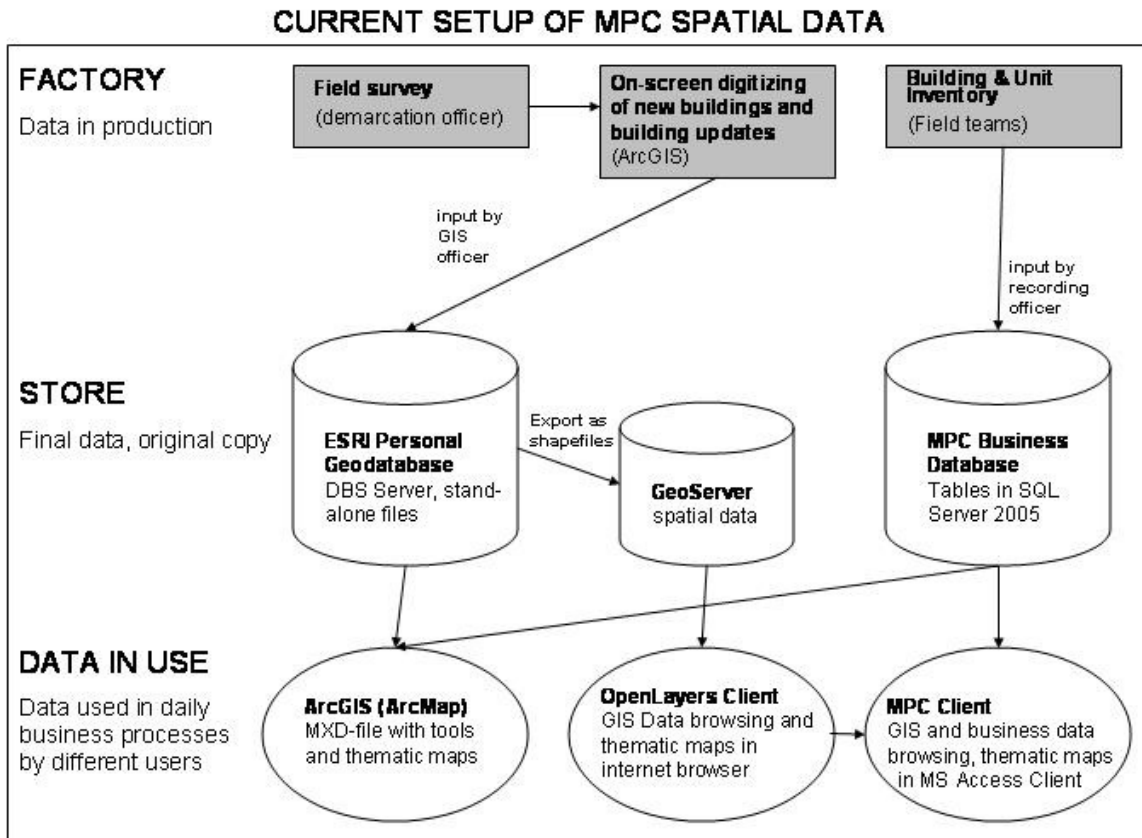


Figure 2 current setup of MPC spatial data

The geographic data are stored in the ESRI Personal Geodatabase, which is used for the editing. The shapefiles are exported to Geoserver to enable viewing and reporting using open source GIS and database management tools.

The attribute data are managed by the MPC Business Database using SQL Server 2005.

Work is in progress to test a possibility to create a complete open source GIS application that would not need proprietary GIS software. This development work has similarities with the FAO and UN-HABITAT efforts to build non-proprietary software applications.

6. STEPS TAKEN 2007-2009

The Multipurpose Cadastre Pilot (MPC I) was initiated by the Steering Committee 8 of the SMOLE Programme in September 2007. Originally the aim was to test the technical and administrative possibilities to bring the key operators (Ministry of Water, Construction, Energy and Lands departments dealing with land issues, Zanzibar Municipal Council (ZMC), Stone Town Conservation and Development Authority (STCDA), Registrar of Land, and Zanzibar Revenue Board (ZRB)) together to develop a GIS base for their various activities.

The aim of the pilot was to contribute to poverty reduction in Zanzibar through transparent public administration, better provision of urban services, and improved development control, by:

- Collecting information on the buildings (condition, units, photograph of the building etc.) in Stone Town,
- Developing databases for revenue collection (rents, waste water/ garbage collection fees, VAT, stamp duty etc.)
- Developing databases for effective development control,
- Developing databases for Stone Town conservation (historically valuable buildings), and maintenance of the buildings, and
- Developing further the already operational ZMC database for monitoring of utility management (sewerage, water, garbage collection, electricity etc.)

A Memorandum of Understanding between the stakeholders was signed in October 2007 between Stone Town Conservation and Development Authority (STCDA), Zanzibar Municipal Council (ZMC), Land Registry, Zanzibar Revenue Board (ZRB), Department of Surveys and Urban Planning (DoSUP) and SMOLE. The partners agreed:

- To cooperate together on the design of a Multipurpose Cadastral System to collect and to maintain land information necessary for the efficient development of land information systems within their organizations.
- To cooperate together on a single data collection pilot, with the resultant individual data sets to be held by the organization responsible for the maintenance of that data.
- To agree to lodge those core data sets necessary for the maintenance of a multipurpose cadastre on a central server, to be maintained initially by SMOLE, and to keep these data up-to-date.
- To cooperate with the other parties on the maintenance of the data
- As far as possible to make other data held by individual organizations available to the other organizations.

Three data collection field groups, each consisting of two people (a male and a female) were formed. Students from Zanzibar University and youngsters who have recently finished their secondary school were trained for the house to house inventory.

The local administrative areas (Shehias) were involved to guarantee access to each house. Public media (TV, radio, newspapers) were used to announce the start of the inventory. The shehia representatives were invited to participate in the data collection activity and to give feedback on any problems arising during the work.

Because of successful completion of the first pilot area (i.e. Stone Town) the Extraordinary Steering Committee 11 decided on 15 September 2008 to expand the implementation of the Multipurpose Cadastre (MPC) Pilot to the following 13 additional Shehias next to Stone Town: Mwembetanga, Vikokotoni, Kikwajuni Juu, Kikwajuni Bondeni, Mchangani,

Kisiwandui, Kisima Majongoo, Gulioni, Miembeni, Rahaleo, Mwembeshauri, Muembe Ladu, Mlandege (See figure 3 below).

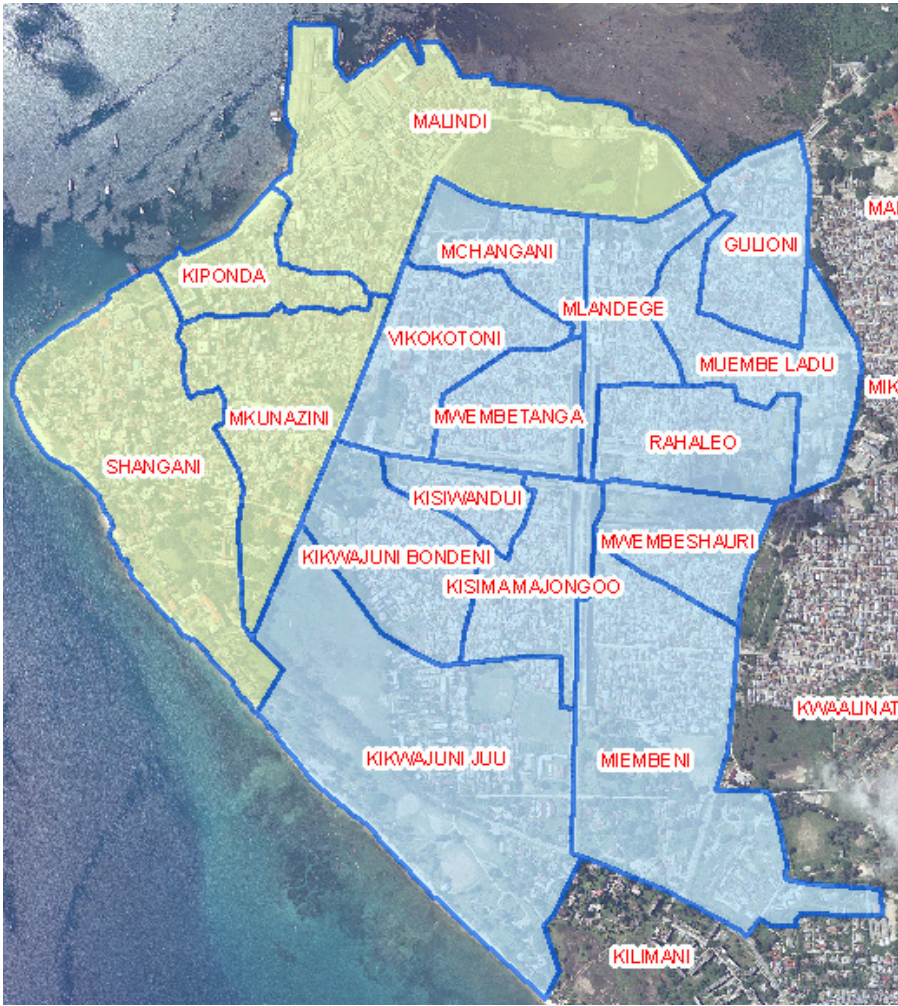


Figure 3 MPC Pilots I and II

7. LAND MANAGEMENT COMPONENTS OF MULTIPURPOSE CADASTRE

The natural continuation from the core data collection was to use the data for adjudication and further for land registration.

The approach was to make a preliminary map of all buildings by digitising their roofprints (the roof is what is visible on an aerial photograph). This was done using a stereo-plotter, which allowed the operator to get some idea at least of how the buildings related to each other. These roofprints were then checked in the field by a Survey Officer. Even though the original photography was only two years old there were some significant changes, indicative

of the rapid development that is now taking place. After the roofprints had been corrected each building was given a unique object ID.

As Stone Town mainly comprises of rows of buildings, often with party walls, and narrow alleys the properties were demarcated by marking the claimed boundary with coloured crayon on the outside edge of the building. This clear mark allowed the neighbours to see what was being claimed and immediately to contest it if they wanted. In practice it was found that there was very little disagreement over the boundaries of what was being claimed.

After demarcation the Survey Officer, who was actually the same person as Demarcation Officer, marked the claimed boundaries on the orthophotos. As the building roofprints had already been marked, the surveys of the claimed parcels really consisted of adjusting the roofprints. The main adjustments were to take account of the roadways in front of the buildings and to attach any gardens or open spaces to particular buildings. Most adjustments were relatively minor.

The same data collection field groups that were used for collecting the building and occupant data distributed also the ownership Claim forms for the occupants. So, also the data collection method was a multipurpose one! As mentioned before the shehias' representatives were actively giving information of the process in their area. The forms given to the hands of the occupants/owners together with information received from the shehia "trustees" made it possible to reach remarkably high percent of returned Claim forms.

The claims and the map of the claimed parcels were then reviewed by the Adjudication Committee. In July 2009 the first "Adjudication Section Summary" i.e. a list of claimants judged to be owners of the parcels along with a "Demarcation Map" was ready. They and the similar documents from other sections later were advertised on the notice board of the Department of Lands and Registration, Registrar of Land Office, and in other prominent places for 90 days period during which anyone who disagrees with the findings could object to the Adjudication Officer. After the 90 days the Adjudication Officer produced a list of undisputed parcels and sent the details of these to the Registrar of Land who opened a Land Register for each parcel.

Disputed parcels were then subject to an adjudication hearing, in which the parties could state their cases. At the end of the adjudication hearing the Adjudication Officer determined the right and right holders over each disputed parcel. After this the Registrar was informed and Registers opened.

There still remains the ability to appeal to the High Court. This should be within 30 days of the Register being created, but longer periods may be allowed in special circumstances.

Figure 4 below shows the official Demarcation map of Funguni Block

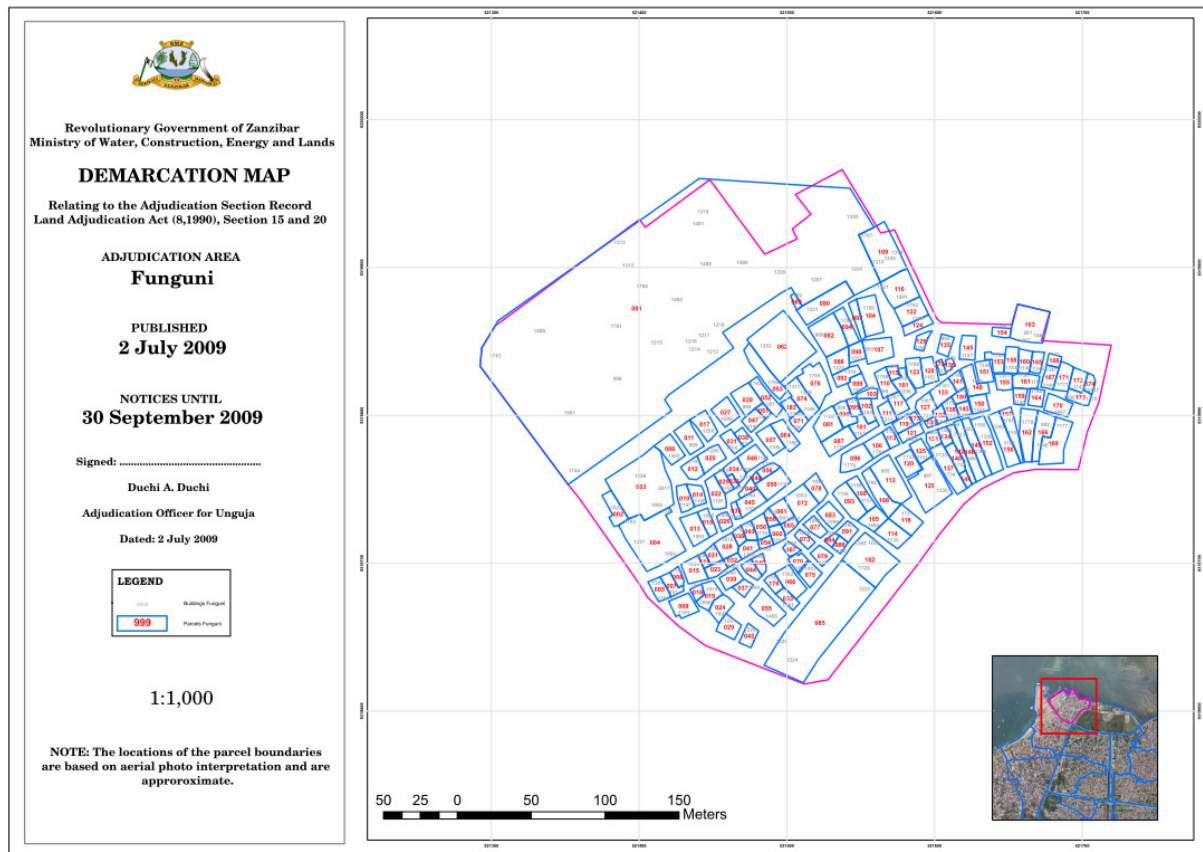


Figure 4 Demarcation Map of Funguni Block

8. REVENUE GENERATION TOOLS

Revenue collection application development with Zanzibar Revenue Board (ZRB) started in August 2008 together with the Zanzibar Municipal Council revenue collection exercise. There have been serious capacity problems with ZMC. Because of them the work has continued with more intensity with ZRB only during the last four months of 2009. SMOLE I Steering Committee 13 of May 2009 approved more development resources for this purpose. The Zanzibar Integrated Tax Administration System (ZITAS) Prototype was completed at the end of 2009 and the data entry and testing of the developed modules have started in January 2010 under SMOLE II.

The Zanzibar Revenue Board ZITAS components are described in Figure 5 below.

REVISED SETUP OF ZRB SPATIAL DATA

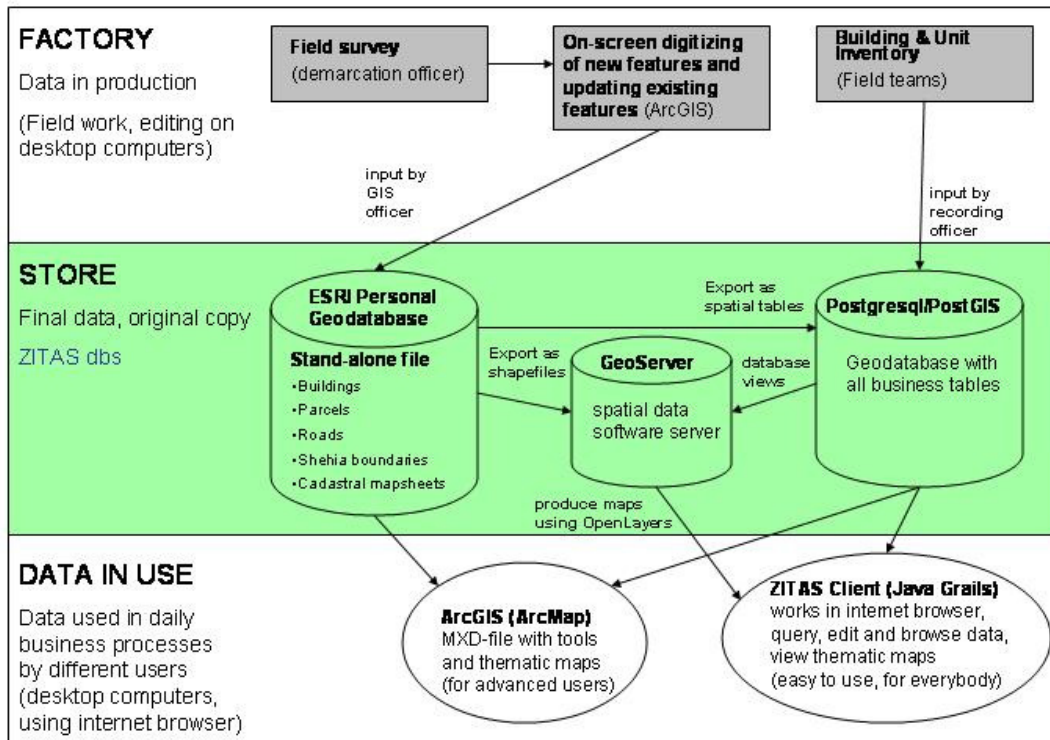


Figure 5 Revenue collection components

The revenue collection components will use the building footprints and parcel boundaries as their key geographic layers. The valuation of the properties will be organized by the ZRB through an outside operator. The revenue collection is then organized by ZRB. Different tailored thematic presentations are available for the follow-up of the collection. These thematic maps can be viewed by an ordinary internet browser. In addition there is a possibility to create more sophisticated thematic presentations using the ArcGIS tools.

9. LESSONS LEARNT AND FUTURE PROSPECTS

The Multipurpose Cadastre approach has been quite successful in actual data collection and verification. The pilot has been able to verify that the data collection method was more or less correct. The major lessons learnt are:

- The role of Shehia representatives continues to be crucial to the success of data collection.
- The simultaneous data collection both for carrying out the data collection for the first time systematic land registration and for other needs of the society in the same process was instrumental in the efforts to reduce costs, bring synergy and to raise public awareness.
- Adjudication database development has been completed, and there is data to be entered in the system. Adjudication still lags behind the schedule, as the Government of Zanzibar organizations have not been able to guarantee sufficient staff for the process.
- However during the last months there has been a remarkable progress in the adjudication. To guarantee the future sustainability, more capacity building and more staff will be needed to support the present adjudication personnel.
- Good results have been gained through establishment of a supplement Registration Team to assist the Registrar of Land in his duties.
- The budget for the MPC Pilot has proved to be quite correct for data collection and data entry.
- Performance related pay has demonstrated that people will work efficiently if they are properly trained and rewarded.
- The MWCEL Decision to move land related revenue collection activities (Land Leases, Property Tax collection) under the responsibility of ZRB is a positive step indicating the ownership of the idea of joint revenue collection based on the model developed and the data collected.
- The work to build links to Zanzibar Municipal Council revenue collection system and Zanzibar Revenue Board “Zanzibar Integrated Tax Administration System” (ZITAS) has started. In the future there needs to be a full systems design exercise to ensure full compatibility of these systems and the MPC.

The future challenges are:

- consolidating the commitment of the participating organizations
- getting a formal agreement to work together (e.g. Memorandum of Understanding on respective responsibilities and data sharing)
- capacity building of the Zanzibari staff to maintain the developed datasets
- securing sustainability by getting a formal agreement to share the collected revenues (done by ZRB) and return a reasonable portion of collected revenues to the local government level (i.e. Zanzibar Municipal Council).

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BIOGRAPHICAL NOTES

Jukka Nieminen is a GIS specialist and urban & regional planner with over 30 years experience in urban and regional development in Europe, Africa, Asia and the Middle East. His overseas experience consists of short term missions to more than 80 countries world wide and long term assignments in Saudi-Arabia (1982-1985), Kenya (1988-1995), Libya (2002-2003) and Zanzibar (2005-2009).

Mr. Nieminen was the Chief Technical Adviser of the Sustainable Management of Land and Environment (SMOLE I) project in Zanzibar during 2005-2009.

Mr. Nieminen is now working as Senior Consultant with Pöyry Finland Oy, a member of the Pöyry Group, consisting of more than 7,000 employees in 49 countries world wide.

Tuomo Heinonen is land surveyor and land management specialist with 20 years of professional experience in land administration, land surveying, GIS-based land registration processes, real estate valuation, land markets, and land policies. He has held management posts at National Land Survey of Finland. He has also experience in the fields of research, real estate valuation and as an international land management consultant (NIRAS Finland).

At the moment Dr. Heinonen is the Chief Technical Advisor in Zanzibar with the second phase of Sustainable Management of Land and Environment (SMOLE II) project for years 2010-2013.

CONTACTS

Mr. Jukka Nieminen
Senior Consultant
Pöyry Finland Oy
P.O. Box 50 (Jaakonkatu 2, Martintalo)
FI-01621 Vantaa
FINLAND
Tel. + 358 10 332 6659
GSM + 358 40 590 6587
Fax + 358 10 332 6761
Email: jukka.nieminen@poyry.com
Web site: www.poyry.com

Dr. Tuomo Heinonen
Chief Technical Adviser
Sustainable Management of Land and Environment (SMOLE II)
P.O. Box 811 ZANZIBAR
United Republic of Tanzania
Tel. & Fax +255 (0)24 223 7008
GSM +255 (0)773 636 851
Email: tjhein61@gmail.com