

Systematic Land Regularization in Lesotho

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SUMMARY

The US Millennium Challenge Corporation (MCC) and the Government of Lesotho signed a five year Compact in 2008 to facilitate reduction of poverty through economic growth in Lesotho. The Systematic Land Regularization Project, one of the projects under this Compact, was awarded in March 2012 to the Joint Venture COWI-ORGUT. The main project objective was to assist the Lesotho Land Administration Authority (LAA) with the regularization of 46.000 urban and peri-urban parcels.

Given the very tight time schedule of 16 months for the realization of a project of this kind, involving a very large amount of data, COWI-ORGUT developed with success a methodology in which field data collection, quality assurance and control, and data management and delivery were entirely digital. This eliminated the problems normally associated with manual systems, like illegible handwritten forms, transcription errors, and lost case files.

For the collection and handling of spatial data, a general boundary survey system was used. Parcel boundaries are defined by physical objects and features and parcels surveyed using orthophotos where the features (fences, walls, hedges) are visible.

The system involved an entirely digital and adaptable workflow based data management process and environment for the adjudication of rights and boundaries. All actions on the data were recorded, providing a detailed status of any adjudication record as well as the automatic generation of aggregated statistics at any time throughout the project. This was an extremely important tool as bottlenecks and problem areas were detected at an early stage, enabling a continuous and pro-active adjustment and optimization of the adjudication process.

A major requirement was the land rights of women and minors in Lesotho and special community meetings were held to facilitate this awareness. All the field team leaders were female lawyers, who could give special guidance about gender issues and the rights of minors.

In a relatively short period of little over a year, COWI-ORGUT handed over 48,000 adjudication records in a complete information system (database and lease generation software), enabling the Land Administration Authority to complete the lease distribution to claimants by the end of 2013.

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1. THE MCC COMPACT AND THE SYSTEMATIC LAND REGULARIZATION PROJECT

Millennium Challenge Corporation (MCC), a US organisation with the aim of fighting worldwide poverty through economic growth, and the government of Lesotho signed a Compact concerning a donation of 362 million USD, which, among others, aims to increase the private sector economic activity in Lesotho by improving access to credit, reducing transaction costs on land, and increasing the participation of women in the formal economy. The Kingdom of Lesotho is a landlocked country (entirely surrounded by the Republic of South Africa) and about 30,000 km² in size with a population of approximately 2 million citizens.

To improve land administration a new Land Administration Authority (LAA) was established in 2010. The LAA houses: the Land Registry, responsible for issuing leases and dealing with changes of owner, parcel size, and mortgages; the Survey Section, responsible for ensuing survey standards; and the Lease Section, responsible for ensuring lease conditions were met, or taking action if they were not.

The systematic land regularization project initially had the objective of registering 46,000 leases in the urban and peri-urban areas of the capital city, Maseru. It being assumed that people in and around Maseru had the greatest wealth, and providing them with clear title would have the greatest economic impact. The project had been expected to start in September 2011, but due to an unsuccessful bid challenge, was actually awarded in March 2012 to the Joint Venture COWI-ORGUT formed by COWI A/S (DENMARK) and ORGUT AB (SWEDEN). What had initially been a challenging project of registering 46,000 parcels in 24 months, had become much more challenging, now reduced to 16 months, with no option of an extension.

The challenges to the project included:

- The need to develop and implement a system for registration of 46,000 parcels to be completed in less than 16 months, based on new laws, the Land Act 2010, which was not well understood by the institutions working with, principally the LAA, and which ran contrary to customary laws and established procedures.
- Conflicts between local institutions, in particular the LAA and the Land and Housing Development Corporation (LHDC), which was responsible for developing land mainly for higher income housing, selling these lands and on final payment issuing leases.
- The fact that there is no national ID system in Lesotho and other means of indentifying people, such as passports, are themselves challenged by the fact the local Basuto names have only recently been written down, combined with a degree

of illiteracy and administrative errors, names may be spelt in a variety of ways, on different documents and also between family members.

To overcome the challenges COWI-ORGUT developed an extensive public outreach and support system, to ensure that all potential land owners knew their rights and were able to claim them, in addition the developed a system where the majority of data were collected digitally in the field. Once collected, the data could be maintained and tracked in a digital environment, thus both increasing the speed of processing, but also removing many of the problems caused by human error.

The Project has led to an updated and expanded register of real property rights with improved quality for the areas of the cities of Maseru including nearby Mazenod, as well as Hlotse and Maputsoe, in the north of Lesotho .



Figure 1: Land Regularization areas in Lesotho

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2. DETAILS OF THE SYSTEMATIC LAND REGULARIZATION PROJECT IN LESOTHO

2.1 The Need for an Efficient and Systematic Land Regularization

Prior to the Land Regularization Project, the distribution of leases in Lesotho has been handled sporadically. A lease applicant first had to engage a licensed surveyor to carry out a precise survey with total station/GPS. The Chief Surveyor would have to approve the survey and then allocate a temporary lease number to the survey, after which the applicant could start the process of getting the lease from the Lease Services and having it registered in the Lease Registry.

This was a cumbersome and lengthy process, which could take several years. Since there was no direct link between the surveys and the lease registration, a large amount of (temporary) lease numbers never materialised as actual leases, often because the applicant deceased or had moved elsewhere. Also many leases did not correspond with the physical situation in the field, in part because of the long time span and in part because no check was made to ensure that lease conditions had been complied with.

The new Land Administration Authority was established to obtain an integration of the services related to the lease management, and the Systematic Land Regularisation Project supported the LAA by regularizing the whole of the capital city of Maseru, including a verification of existing leases.

2.2 Methodology

The methodology used in the Systematic Land Regularization Project can be summarised as:

- extensive public awareness, starting with local politicians and community leaders, then public meeting, with special meetings for women, following which there was support at local level with understanding the law and completion of claim forms.
requiring claimants to mark up the boundaries of the land they are claiming using coloured flagging, and then surveying the boundaries using orthophotos and ground surveys.
- assisting claimants by filling in their claims digitally along with scanning of supporting materials, so that all information used to support a claim is held digitally from the start, removing the problems of reading illegible forms, making transcription errors and linking supporting evidence to the wrong claim.
- providing quality control and monitoring of data and processes digitally so that all processes for each claim can be tracked through the system and leases produced using the original data provided by claimants and quality controlled by the project.

The main steps in the rights adjudication process were:

- public outreach and awareness campaign
- (digital) data collection and quality control in the field,

- additional quality control in the central office,
- prepare adjudication records and maps for public display,
- public display of rights adjudication results,
- resolve corrections, objections and disputes,
- final quality control by Land Administration Authority,
- prepare leases for registration, and
- distribution of leases.

2.3 Use of a Digital Process for Rights Adjudication

COWI-ORGUT successfully conducted the first project in sub-Saharan Africa to use an entirely digital workflow based data management process and environment for rights adjudication, from collecting information in the field to the generation, printing and distribution of leases.

The details of the informal settlement occupiers and evidence supporting the claim were entered and scanned in the field in the presence of the claimants.

The methodology ensured that quality controlled data was accessible in the central Information System immediately after adjudication, which has allowed the project to be concluded within a relatively short period as well as to ensure data correctness and completeness.

At any given time the detailed status of a parcel in the rights adjudication process could be retrieved and reliable aggregated statistics could be generated. Throughout the project, based on various quality control sessions, the digital adjudication process was continuously fine-tuned and optimised.

The problems associated with manual systems, such as reading the handwritten forms of claimants, transcription errors during data entry from handwritten forms, locating copies of supporting documents to the appropriate claim, etc. are non-existent in a digital approach, and a full audit trail from data capture to lease printing was established.

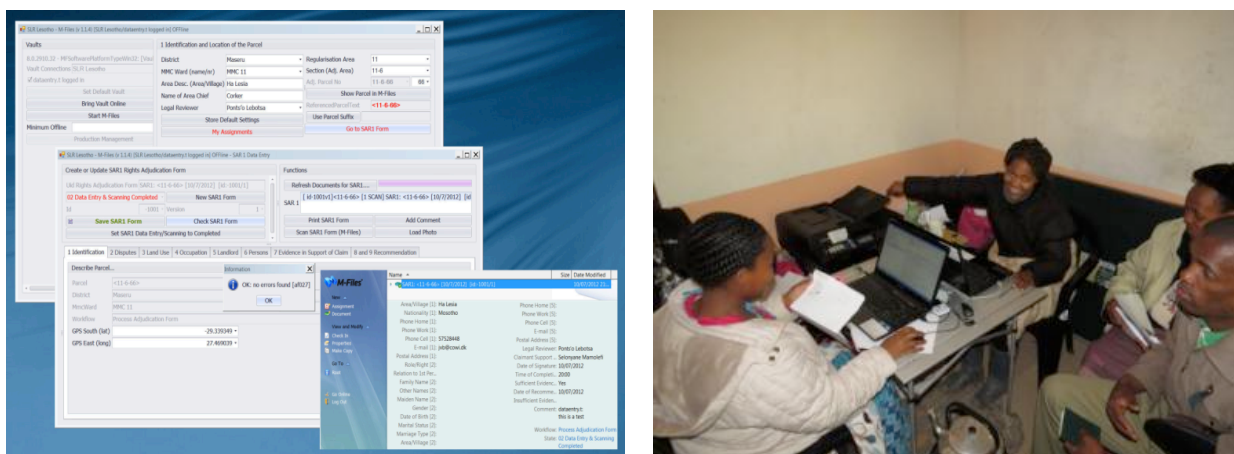


Figure 2: Data Entry in the Field

2.4 Public Outreach and Awareness in Declared Regularization Areas

Public outreach and legal advice was a major component of COWI-ORGUTs approach. The primary objective of public outreach activities was to ensure that all project stakeholders understood their rights and responsibilities with regards to land regularisation. Of particular importance were the changes that resulted from the Land Act 2010, which gave equal rights to men and women, as well as protecting the rights of minor (AIDS orphans being very common in Lesotho). This was in contrast to the situation under customary law, where women and minors had relatively few rights, as land was normally inherited by a male heir.

Outreach involved a number of statutory notices of the intention to regularise, followed by meetings, first with politicians and community leaders, and then with the public. To explain about the rights of women, there always was a specific meeting for women after the general meeting.

In addition to meetings, the outreach included newspaper, radio and TV announcements and programmes and the use of SMSs. SMSs proved to be particularly useful as a means of telling people about leases that were ready for collection. As Lesotho has a very large Diaspora population, with many people working in South Africa, as well as a number working in the diamond mines in Lesotho itself, outreach also attempted to reach these people. There were visits to the Lesotho diamond mines, programmes on South African radio and visits to the South African mines.



Figure 3: Community Meetings in Maseru

2.5 Use of General Boundary Surveys

The Land Act allowed the use of general boundary surveys as an alternative to the fixed, or precise boundary surveys that were used in the earlier sporadic registrations. With general boundaries, the boundary of a parcel was defined by semi-permanent features, such as a fences, hedges walls or roads. If the boundary was clearly demarcated on the ground, all that was necessary in terms of survey was a relatively low precision survey which indicated the nature of the boundary and approximately where it could be found. In effect saying "within two metres of here there should be a wire fence on wooden posts, and that is the boundary of this parcel". General boundaries are used on many land administration systems. While land surveyors who have been brought up with fixed boundary systems often complain that general boundaries are not accurate and lead to disputes, the reality is that in many cases they are more accurate, as fixed boundary surveys often only measure the corner points of parcels and assume, wrongly, that the boundary between corners is a straight line. The cost of dealing with boundary disputes is also higher than the difference in costs between general and fixed boundary surveys.

2.6 Use of Orthophotos and Pre-vectorized Parcels

Orthophotographs were used to make a preliminary assessment of the parcel boundaries, defined through digital pre-vectorization. These pre-vectorized parcel boundaries are verified and confirmed in the field after the claimants mark up these (demarcated) boundaries with coloured tape. If the pre-vectorized boundary does not correspond to the actual boundary on the ground within a prescribed tolerance (2.5 m), the actual boundary was more precisely measured by using GPS. Only around 25% of the boundaries were measured by GPS, mostly in areas, where no updated orthophotos were available. New orthophotos were one of the preconditions of the project, but they were not ready until some months after the start. COWI-ORGUT therefore had to commence regularisation using satellite imagery, which turned out to be too inaccurate and resulted in many interpretation errors that had to be corrected by precise surveys.



2.7 Field Teams

Each regularization section of 4-600 parcels was the responsibility of one team which comprised up to 9 people: 3 or 4 Claimant Support Officers; 2 or 3 Data Entry Officers; a Legal Reviewer, who was the Team Leader, and a Surveyor, who was employed by a licensed survey company. The teams worked out of temporary offices with laptops and scanners in the field, often a spare room in someone's house.

The new Land Act 2010 emphasized equal property rights for men and women, thus the project focussed on creating special awareness among women; both by radio announcements and by having separate women's meetings in relation to the community meetings. All legal reviewers/team leaders in the project were female to enable a more direct consultation in the field. And just over 50% of the lessees were female.

2.8 Field Processes

When a new section was started the Claimant Support Offices (CSOs) made a preliminary visit to tell people about the adjudication process, the documents they needed to provide and the fact that parcels should be demarcated. The CSOs revisited the parcels and provided claimants with coloured plastic tape to mark up their boundaries. They also took a GPS reading of the parcel and gave claimants a card with the parcel ID and the GPS reading.

Claimants normally visited the site office, although if they were infirm the team would visit them. Rather than have claimants fill in paper forms and try and transcribe them, the COWI-ORGUT approach was for data entry officers to fill in the form for the claimants directly into field computers. The form was printed and given to the claimant to check for accuracy. Only when the claimant was happy that the data was accurate did they then sign it. The forms were then checked by the Legal Reviewer to ensure that there was a valid basis for the claim. The signed form was then scanned with a digital version being stored and a printed copy being given to the claimant, effectively as a receipt that they had made a claim for a specific parcel.

Evidence, supporting the claim, such as passports, and letters drawn up by the Chief, were scanned directly into the field system, linked automatically to the digital rights adjudication form. The signed paper copy of the claim form, the digital copy and the digital copies of the evidence in support of the claim were all used to support the claims, and eventually all was delivered to the LAA along with the draft leases.

The legal reviewer evaluated claims in the field and provided recommendations on whether to issue a lease or not. The legal reviewer also provided legal advice and if there was a potential dispute, mediation. One of the major successes of the project was the avoidance of serious disputes. That people could get clear, unbiased legal advice in the field meant that they could avoid getting into long, costly and unpleasant disputes, often with other family members.

After the parcels were marked up the surveyors visited the parcel and checked the boundaries against the pre-vectorized parcels on the orthophotos. From the start of the project the pre-vectorized boundaries were shown on printed parcel plans. Both the field staff and the surveyors used these parcel plans to check against the boundaries on the ground. Particularly for the field staff, who often had a legal rather than a survey background, the use of paper plans caused some difficulties with navigation and errors were made with people attributing the wrong parcel number to parcels on the ground. To overcome these problems hand held GPSs were used so that the coordinates of each parcel visited could be recorded and then checked back in the office.

During the project an application was developed by two Swedish students in which the orthophoto, the pre-vectorized parcel boundaries and the claim form were available on an Android Tablet PC. This system was field tested and found to be a significant improvement on the paper based system. It removed the need to carry lots of paper around; the GPS in the Tablet was accurate enough to centre the image over the location of the observer, once located the operator could then relate the physical features on



the ground to the visible features on the orthophoto and check the pre-vectorization. The form and data could also be checked in real time in the field.

2.9 Additional Quality Control in the Central Office

Information from the digital field system was synchronised at regular intervals into a central office information system, i.e. the rights adjudication information and the adjusted geometry. The original signed rights adjudication forms were placed in folders and archived. The digital copies of the signed forms and all other data were stored on the central office information system. A second round of quality control on the alphanumerical and spatial information was performed in the central office. Of particular importance was checking the names of applicants against the scanned evidence of identity: passports, driving licenses and voting cards. COWI-ORGUT only accepted a claim where the name matched that on the evidence. Spatial data checks were made to make sure that all parcels had adequate access and there were no overlaps or unexplained gaps between parcels.

2.10 Preparing the Adjudication Records for Public Display

The adjudication and spatial records were compiled into a cadastral plan and list of right holders. The cadastral plan used the orthophoto as a base and had important landmarks labelled, along with the parcel boundaries and parcel numbers. The list had the parcel numbers, the right holders and brief details about the claim.



Figure 4: Publication of cadastral plan and the list of right holders

2.11 Public Display of Rights Adjudication Results

The cadastral map and the list were displayed for a period of 30 days in a prominent place, often where the adjudication office had been, or the chief's office. An additional copy was also displayed in the LAA. In the first day of display a public meeting was held to

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explain to the people about the maps and lists. Staff and legal advisers were on hand to answer any queries and to provide record amendment forms if people thought there were errors.

2.12 Resolve Corrections and Objections

After the public display period the lodged record amendment forms were processed. This may result in names being changed, right owners added or removed or parcels assigned to others. It may also result in no action being taken if the objections were not held to be valid. If disputes were held valid then mediation was attempted to resolve them. In most cases this proved successful, but if they could not be resolved the parties in dispute were left to resolve the matter in court.

2.13 Final Quality Control by Land Administration Authority

After processing all the amendments to the displayed adjudication records, the final adjudication records including the spatial records were provided to the Land Administration Authority, where a final quality control was conducted, prior to lease generation and printing. Based on an agreed confidence level (i.e. 95% of a 4% data sample should not contain any critical error), the data set was approved or send back for corrections.

2.14 Prepare Leases for Registration

After approval, the leases, lease covers and summaries were automatically batch generated in common word processing formats, then printed and bundled with the original signed rights adjudication form. The Land Administration Authority then officially stamped, signed and registered the leases.

2.15 Distribution of Leases

After registration of the lease by the Land Administration Authority, the distribution of leases to the rightful occupants was planned in the communities. All right holders were informed by a personalised SMS with lease number, location and time of the lease distributions. The lease distribution teams were facilitated by information systems with the adjudication records to enable them to handle any queries.

The use of personalised SMS contributed significantly to a high participation in the lease distributions. Often around 75% of all leases were distributed to right holders within a three day campaign in a community.

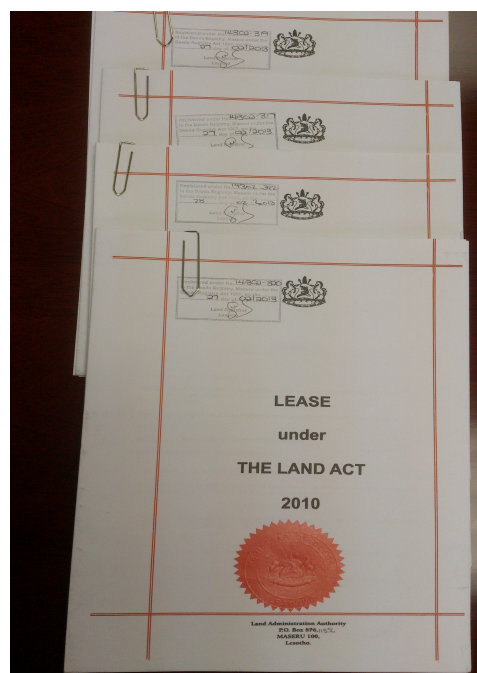




Figure 5: Lease Distribution

3. LOOKING BACK AND AHEAD

Both companies COWI and ORGUT, had previous experience of land administration projects in Africa, and knew that the conditions anticipated before the start of a project are very likely to change considerably. Especially with a very short time frame (16 months in total) it was important to build a flexible data management system which easily could be adjusted and fine-tuning during the project without losing any of the data collected earlier in the project.

Another important factor in the success of the project was the organizational flexibility. When there was a need for a reorganization or reinforcement of the labour force, it was possible to recruit and train new people by using the local or regional companies that had a similar experience and often had worked with COWI or ORGUT at other projects.

The field work was conducted by local field teams who had been contracted to work on the project, more than 100 in total. Most of the staff had not used orthophotos or been involved in any similar project, so there was a very significant training and internal quality assurance programme. Not only did COWI-ORGUT succeed in regularising more than the 46,000 parcels in less than 16 months, as a direct result of the training they received many of the staff went on to further education or better jobs which utilized the skills they had been taught.

As mentioned earlier, entering data directly was critical to the success of the project. It virtually eliminated the errors resulting from not being able to read handwritten notes, and their transcription, but also the problem of linking supporting evidence to a particular claim. Using a digital environment make quality control easier and more certain, as well as allowing the batch production of leases. Unfortunately the LAA's processes and laws did not

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allow them to take full advantage of this digital approach. After delivery from COWI-ORGUT the LAA had to handwrite the details of each lease in a ledger, while embossing and signing by hand each lease.

As would be expected with a digital environment, changes in technology affected the processes used even within the life of the project. The use of Tablet PCs helped to reduce problems with parcel identification and mapping. Potentially they could also eliminate the need for pre-vectorization and allow claims to be made on the parcel, rather than asking claimants to come to a site office.

A problem often encountered in land regularization projects is the lack of up-to-date maps and orthophotos. This was also the case in the Lesotho project where the new orthophotos were delayed for 4-5 months. Alternative solutions were sought, such as using COWI's in-house capacity of producing intermediate orthophotos based on satellite images or images produced by drones.

COWI now has become one of the foremost experts in the use of small UAV's (Micro Unmanned Airborne Vehicles) for mapping.

This technology can in many situations replace the use of traditional aerial photography and orthophoto production, as it is possible to produce cheap high resolution orthophotos for specific areas within a couple of days. This has a great advantage in land regularization projects, where the maps can be real up-to-date.



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BIOGRAPHICAL NOTES

Jan van Bennekom-Minnema obtained an MSc in 'Geographical Information Management and Applications' from Utrecht University, The Netherlands. He is a specialist in Land Administration, GIS and IT, and has since 1990 been working in many international information system development projects, covering the fields of land administration, property registration, cadastre, spatial development, national and local governmental services in South and Central America, Western and Eastern Europe, Middle East and Africa.

Jakob Riise has an MSc in Surveying, Geodesy and Cadastral Science from University of Aalborg in Denmark. He has worked as a private licensed surveyor in Denmark and for the Danish Department for Cadastral Mapping and Science. Since 1999 he has worked for COWI A/S with infrastructural projects and many international cadastral and land information projects in Africa, South and Central America and Asia.

Ian Corker has a MSc in Geographic Information from City University, London. He has worked in land use planning, land management and land registration since 1973, mostly in Africa, the Caribbean and the Middle East. He has managed land registries and has lead systematic land registration teams. He is a Fellow of both the Royal Institution of Chartered Surveyors and the Chartered Institute of Arbitrators.

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