

The Darwin Project:

Controlling an invasive aquatic plant for improved biodiversity and livelihoods







MEDEEM Zambia is working with BirdWatch Zambia in collaboration with the Darwin Initiative of the UK Government, Zambia Ministry of Fisheries, Zambia Agricultural Research Institute, and Centre of Agriculture and Bioscience International. The prime objective of The Darwin Project is to improve the conditions for water birds, wetlands and the livelihoods of local fishermen.

The Lukanga Swamp, located in central Zambia is recognized as a Ramsar site as well as an Important Bird and Biodiversity Area (IBA). It hosts over 350 resident and migratory bird species including several globally threatened species such as Wattled and Grey Crowned Cranes. The Lukanga Swamp is also highly important for the local


community, whose livelihoods are supported by fishing its waters. This swamp supports about 20% of Zambia's fish population.

Unfortunately, since 2009 the swamp has been infested by the invasive Kariba weed that has begun to cover over 60% of the surface area of the swamp. BirdWatch Zambia was awarded funding to conduct a 4-year bio control project by the Darwin Initiative of the UK Government after manual removal methods failed to control the infestation. Successful weed management is expected to increase dissolved oxygen in the water, improve the fish population, restore habitat and increase the population of globally threatened species and other water birds.





MEDEEM Zambia has developed a situational GIS application for the project, enabling the project team to perform comparative analysis using satellite imagery.




Partnering to Improve the Livelihoods of Small Holder Farmers

MEDEEM Zambia partners with Traditional Authorities, local Councils, NGOs and private sector companies in support of its mission to strengthen the livelihoods of small-holder farmers, promote food security and create reliable supply chains that will support an inclusive and sustainable local economy.

ArcGIS offers the platform for collaboration with other stakeholders, providing tools to gather data from multiple sources, streamline productivity and help create a more informed community-wide planning process.

Our solution begins with a map that documents and visualizes the reality as it exists on the ground. People are linked geographically with their rights to the land providing the dignity and economic empowerment of land tenure security. The farmers' individual parcels form a base map that, when combined with other key data layers, serves as a focal point for community wide discussion and analysis.





When it Comes to Land-Accuracy Matters

MEDEEM's ParcelCert™ process, backed by intelligent systems, makes it possible to efficiently collect and record highly detailed and accurate land tenure and parcel survey information for the benefit of its clients. Surveyed parcels are uploaded to ArcGIS parcel fabric for validation. Should gaps or overlaps be found, the impacted surveys are returned to the village for refinement or adjudication until accurate boundaries can be determined.



Neighbors and stakeholders walk boundaries together during the ParcelCert survey process encouraging field adjudication of minor disputes as they arise.



ParcelSurveyor®

A Software Solution Delivering Efficient, Affordable Access to Land Tenure Security without Compromising Accuracy

MEDEEM's custom survey workflow produces automated outputs with speed and accuracy through its innovative ParcelSurveyor® software solution. ParcelSurveyor runs on a Trimble GeoXT device, supporting 3-D cadaster and providing accurate, survey grade

points from the onset. Leveraging esri's technology platform, MEDEEM's ParcelSurveyor is able to complete survey workflow and map production over 10 times faster than traditional land survey production methods at a fraction of the cost.



ParcelSurveyor® Simplifies the Survey Workflow

- Simultaneously gathers point, line and polygons within single job orders
- Capable of visual review and re-ordering of survey points on-the-fly
- Imports adjoining boundary points between surveys
- Users can load imagery as backdrops to survey data
- Validation of field information and polygon shape on screen in the field
- Workflow organized into discrete tasks. Minimal training required
- Sync data straight to an ESRI geodatabase



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MEDEEM: Leveraging Technology And Local Enterprise

MEDEEM's mission is to provide equitable access to land tenure security. MEDEEM's private sector approach drives change from the bottom up, one village and one parcel at a time. MEDEEM builds capacity in country by providing technology, training and local jobs – embedding MEDEEM in the social fabric of the country.



Promoting Land Tenure Security for Women Living in Traditional Communities

In Zambia, women provide over 70% of all agricultural labor required for food and as much as 60% depend on rural land for their livelihoods while less than 2% of these women hold any form of land tenure documentation, occupancy permit, lease or title deed. This disparity alone is considered to be a major contributing factor to the feminization of poverty. MEDEEM Zambia has recently partnered with Zambia's Ministry of Gender to promote land tenure security for women living in traditional communities.

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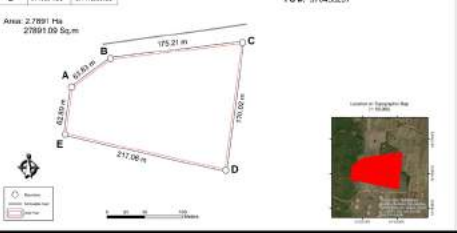
UTM Zone 27 Ministry of Gender

Site Plan For:
KALINDAWALO CHIEFDOM WOMEN'S COOPERATIVE



Locality: KALINDAWALO HEADQUARTERS
District: PETAUNGE
Province: EASTERN
PC #: 876453297


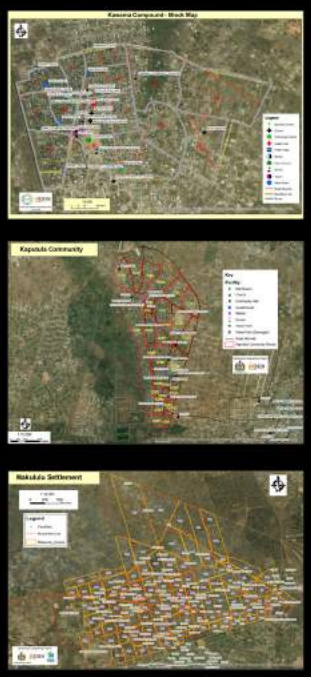
POINT	E	N
A	171,883.93	16,411,431.12
B	171,749.00	16,419,498.00
C	171,519.00	16,419,498.00
D	171,486.77	16,419,221.45
E	171,884.95	16,411,388.81

Area: 2,7891 Pk
27891.00 Sq.m



▲ *The first phase of the Women's Land Rights Initiative partnership focused on surveys of women's agricultural cooperatives in the participating chieftaincies.*






Formalization of Zambia's Unplanned Settlements Provides Legal Empowerment to Thousands

MEDEEM Zambia has embarked on important new work with local government councils to regularize large numbers of informal settlements throughout Zambia. This is a first-of its kind documentation program providing increased land tenure security for thousands of Zambia's informal settlement residents.

The program also includes the production of community wide base maps for use by local government councils that provide critical information and data layers for city planners to promote smarter, proactive and more inclusive community planning processes.

Initial Base Maps for a selection of Unplanned Settlements. Through the establishment of block boundaries and the assignment of house numbers a system for property addresses is created for the community.

Individuals receiving Occupancy Permits formalizing their land tenure status. A survey of their plot and a home address can be critical for opening a bank account and obtaining access to capital.




Building Capacity In-Country Means Creating Local Jobs

This is the Next Generation of GIS Professionals

MEDEEM Zambia's Chief Technology Officer, Ebenezer Odoi, teaches GIS and engineering systems courses at the University of Zambia, where he is helping to train Zambia's next generation of GIS engineers. In working with these students, MEDEEM Zambia engages in a unique opportunity to introduce local engineering students to Geographic Information Systems (GIS) concepts, Mobile application development, and Esri's ArcGIS platform with emphasis on data integration with current industry standards in Zambia. In turn, MEDEEM Zambia also provides meaningful employment and internship opportunities for promising students eager to apply their skills in the field.

These educational and employment opportunities for Zambia's youth would not be possible without Esri's generous support and commitment to education. Esri's contributions of training materials and software enable the University of Zambia to establish a first class curriculum in GIS, graduating many university students with these new interests and skills. As MEDEEM Zambia grows, it is building a solid base of new local hires that are well educated, trained and qualified in this important technology. MEDEEM is grateful for the support and leadership Esri has shown in making education a priority.





Bridging the Land Tenure Gender Gap in Zambia


Although the Zambian Constitution recognizes property rights and protects individuals from the deprivation of property, other laws and customary practices often fail to uphold women's land rights. Women's tenure security continues to be influenced by customary norms and studies have shown that a majority of Zambian women lack knowledge of the existing Lands Act or the procedure and place of issue of title deeds.

MEDEEM Zambia is working to close this gender gap by providing its Land Rights Awareness Program at the local village level, equipping women with knowledge of the importance of documenting their lawful rights with respect to the land. MEDEEM's unique approach is designed to be more accessible and less intimidating to women by bringing the land rights documentation process directly to their doorstep and by utilizing female ParcelCert officers who are fluent in local dialects and local customs. MEDEEM's private sector, financially self-sustaining approach of making ParcelCert™ affordable by its clients is further empowering to the women it serves.




MEDEEM's Partners and Affiliated Organizations

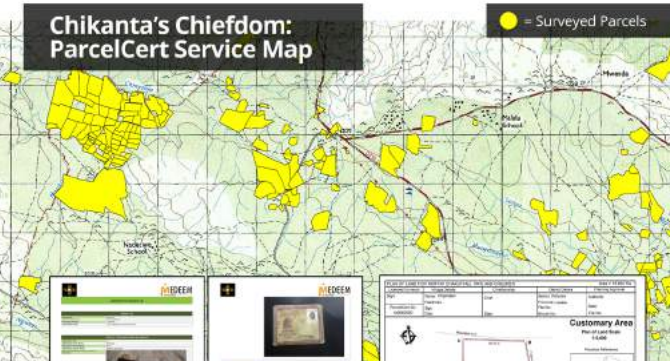
Esri	Habitat for Humanity Zambia
Lundin Foundation	Musika
Trimble Navigation	Opportunity International
Acumen Fund	SpatialMax
IFormbuilder	World Wildlife Fund Zambia
BirdWatch Zambia	
Corporate Initiatives Development Group	
Habitat for Humanity International	


MEDEEM Zambia Documents Customary Land Rights

In the communities MEDEEM Zambia serves, most land is held within the customary system where traditional authorities hold the land in trust for their people. An individual's rights to use, occupy or own the land is typically granted by Chiefs or Headmen through oral agreements. MEDEEM's ParcelCert process helps individuals formally document these rights so they are able to better protect their investment in the land and utilize it as a productive asset. MEDEEM is currently working with a number of major chieftaincies representing hundreds of thousands of constituents in more than 8 Districts across Zambia. MEDEEM is "the key that unlocks the potential we gain from our partners in the private sector to provide support and services for our farmers," according to Chief Chikanta.

Chikanta's Chieftom: ParcelCert Service Map



● = Surveyed Parcels



A sample of selected pages from a client's Customary ParcelCert land rights documentation package.

Providing Tools for Informed Land Use Planning in Traditional Communities

In Zambia's traditional areas, MEDEEM's process organizes the land inventory for the Chief while also generating a foundation of land tenure security for his/her constituents. MEDEEM's Traditional Area Service maps provide a foundational basis for smarter and better-informed land use planning decisions. For example, existing footpaths may provide the basis for the location of new roadway easements, or how best to connect a concentration of farming lots for distribution to the marketplace. Once a comprehensive parcel service map is created, the chief is better equipped to manage the land more effectively and to plan for a brighter and more resilient community that will address the future needs of his/her constituency.

A female constituent receiving a ParcelCert document that formalizes her traditional rights with respect to the parcel of land she holds.




Chief receiving a map of the traditional area under his control that includes existing individual parcels, roads and services which have been surveyed by MEDEEM Zambia.



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MEDEEM: Lifting Local Economies One Parcel at a Time

Over one billion of the world's poor lack the simple security of legally recognized land rights. The inability to gain formalized land rights remains a formidable barrier to economic progress worldwide. MEDEEM's mission is to provide equitable access to land tenure security and targets its services to those at the base of the economic pyramid, focusing on women, smallholder farmers and other vulnerable groups. MEDEEM recognizes the dignity, economic empowerment and peace of mind that comes with land tenure security.



Sometimes Differences Unite Us

MEDEEM Zambia: Helping Communities Understand Interconnections




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MEDEEM's ParcelEye®

Delivering Comprehensive Land Tenure Documentation

The MEDEEM ParcelCert™ process includes a highly efficient workflow and proprietary mobile data collection system called ParcelEye® that is easily customized to meet the specific needs of government or traditional land registries. ParcelEye® is capable of collecting all pertinent land tenure information from the client as well as relevant testimony from boundary neighbors.

ParcelEye® captures data and digital images of the client, the property, identification cards, signatures, fingerprints as well as all other relevant evidentiary documents. All data and images are digitally stored in a secure cloud-based data center with multiple data feed capability for measurement and evaluation purposes.



Empowerment Begins with Knowledge

When people don't know their rights they are more vulnerable to losing their land. This is especially true for women and those who hold informal rights to land particularly where illegal land grabs have become common. Integral to MEDEEM's ParcelCert process is their customized Land Rights Awareness Program, designed to equip people with knowledge of their communal and constitutional rights as they relate to land. Our ParcelCert officers are fluent in local dialects and are able to encourage participation and dialog at the village level.

We stress the importance of documenting land rights and how to recognize and avoid predatory practices. MEDEEM's Land Rights Awareness program is introduced at the village or community level through group meetings to invite local participation and engagement. The Land Rights Awareness Program is followed by one-on-one interviews with each client during the Parcel Certification process where clients are given further opportunity to ask questions in a private setting.



