

The Land-Potential Knowledge System: Developing Appropriate Technology for Improved Decision Making



www.landpotential.org

11 December 2014



¹USAID

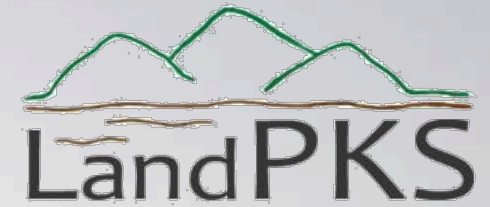


²USDA – ARS Jornada (New Mexico, US)



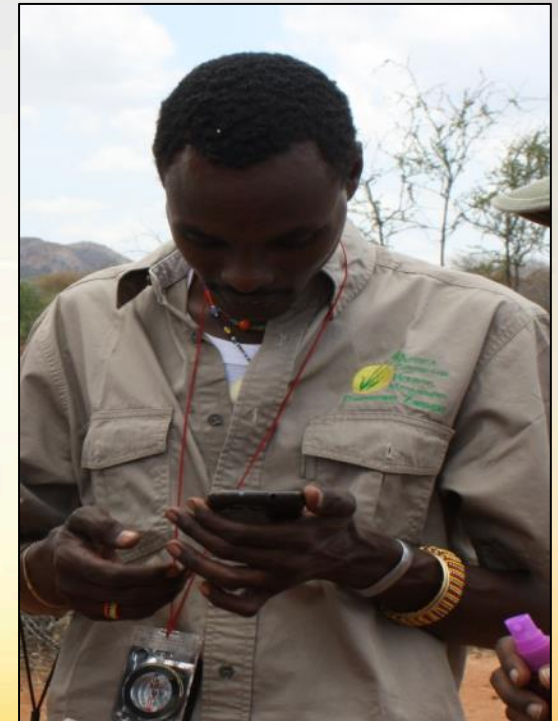
³ATPS

Land-Potential Knowledge System



A suite of applications using mobile and cloud computing technologies to:

- **Globalize** access to local, indigenous and scientific knowledge
- **Identify** knowledge relevant to each type of land, soil and climate
- **Connect** people with similar types of land and potential



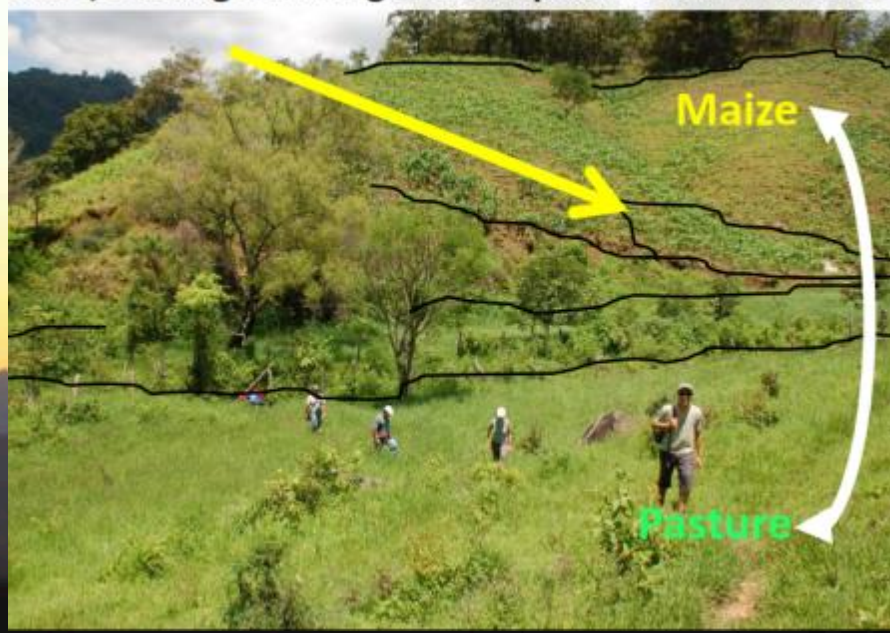
Match land use with its potential



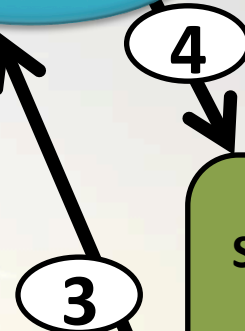
LandPKS provides information to assist governments, farmers, pastoralists, and development workers to make informed decisions that will lead to increased agricultural production, biodiversity conservation, and improvement of other ecosystem services.

LandPKS will assist decision making on (1) sustainable intensification on existing lands, (2) restoration of degraded lands, and (3) converting to agriculture only those lands where potential production is high, and degradation risk and loss of other ecosystem services is low

AND/OR target management inputs to maximize ROI



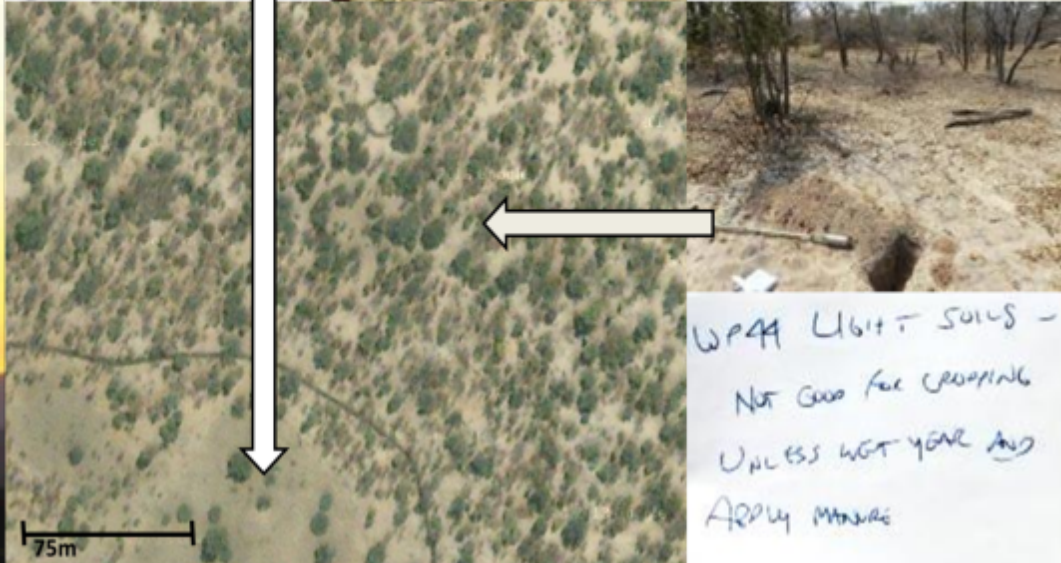
Knowledge Engine supported by global databases & models



Sustainable land management options

Prediction of potential productivity and degradation risk

Additional questions from app



LandPKS Pilot Sites

Kenya

- Community Wildlife Conservancies in 3 counties.
- Local NGO: Northern Rangelands Trust (NRT)
- Identifying and prioritizing areas for restoration of perennial grasses.



Namibia

- Ministry of Lands and Resettlement (MLR) & Ministry of Agriculture, Water, and Forestry (MAWF)
- Private contractor (AGRA)
- Improved understanding of spatial distribution and production potential of soils.





LandPKS and the Namibian Government
Needs assessment and training for Namibian Ministry personnel

LandPKS and Namibian Communities

“We need to see beyond what we see, because that can help you decide what to do next.”





LandPKS and Kenyan Partners: Training ATPS and RCMRD staff



LandPKS and Kenyan Partners: Training NRT staff



LandPKS and Kenyan Partners: Training community conservancy staff



LandPKS and Kenyan Partners:

Training community members through newly trained extension staff



LandPKS and gender representation: Outreach to women at the village level (left; Sasaab community) and employing women scientists (right; Lilian Ndungu, RCMRD GIS Specialist)

LandPKS and Appropriate Development

LandPKS will never completely replace the need for extension and face-to-face conversations....



....Instead, it will allow these conversations to begin with as much existing knowledge and information as possible, from **local, indigenous and scientific sources** from around the world.

Early 2015
(global)



Land Info
Site
characterization
w/ cloud data
storage & access

Veg Monitor
“Stick
method” for
monitoring
rangelands

**Soil Texture By
Feel**
Texture
decision tree
w/video
tutorials

Early 2015
*(Kenya and
Namibia pilots
only)*



Land Potential
Relative potential productivity and soil erosion risk for 2
general management systems (crop + forage)
Soil prediction: simple profile matching
Productivity/erosion prediction: APEX

Future modules
(2015-2017)



Land Potential II
Outputs: crop, management
options, links
Soil predictions: app profile
descriptions, maps, ISRIC predictions
Productivity/erosion prediction:
APEX, other models, user inputs

Climate Change

Soil Erosion

**Crop & Forage
Production**

**Social
Networking**

**LandPKS Product
Release Detail**

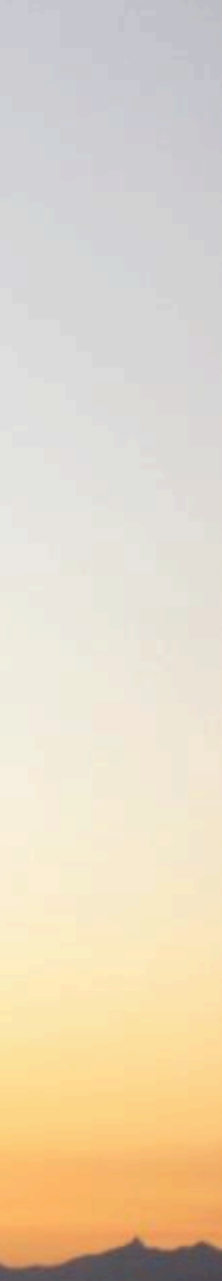
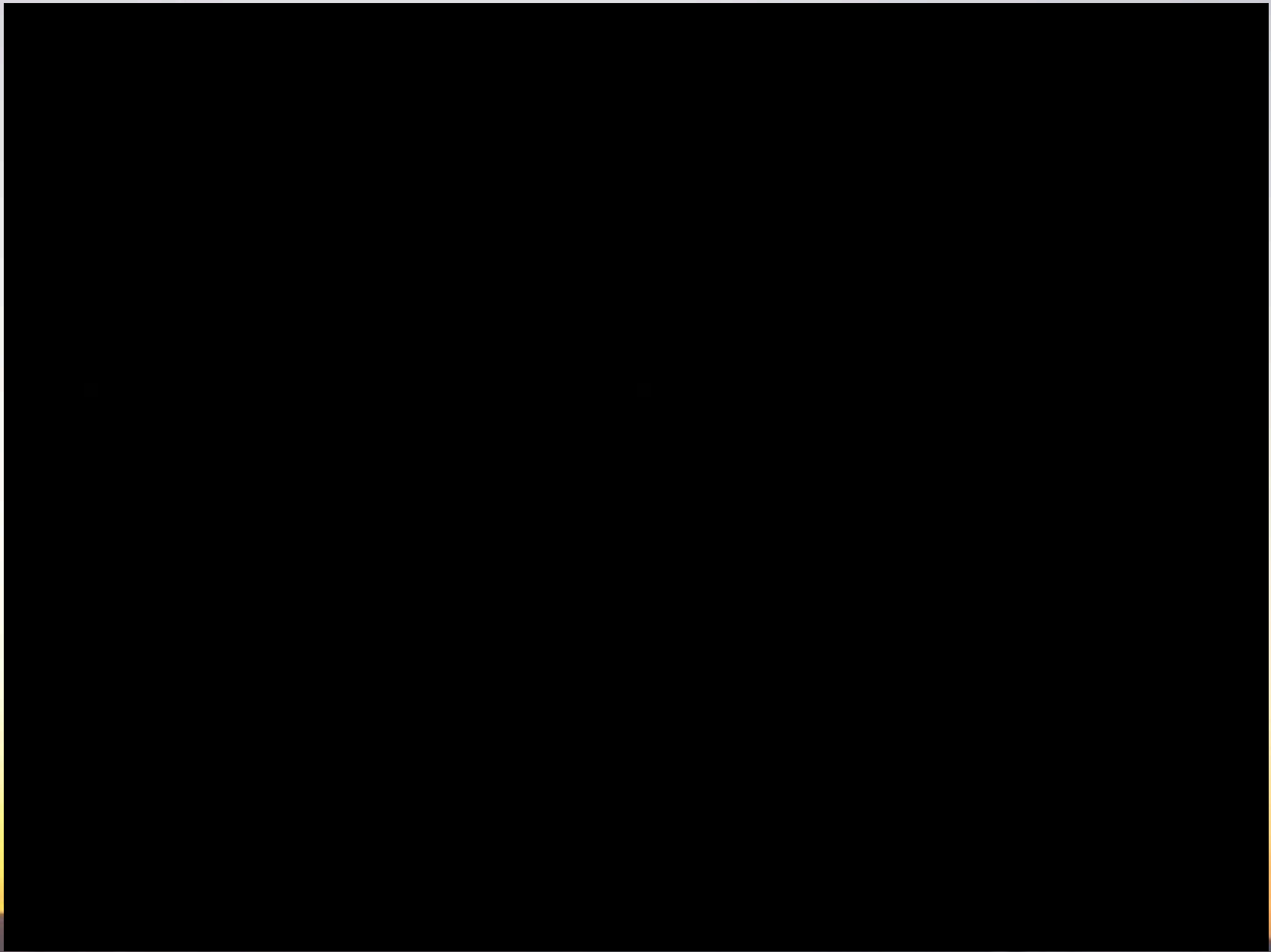
LANDPKS ANDROID APPLICATION

Simple Interface. The site characterization application offers a simple user interface, graphical displays, and a logical work progression to allow individual users with no formal soil science training to assess soil characteristics at the point level.

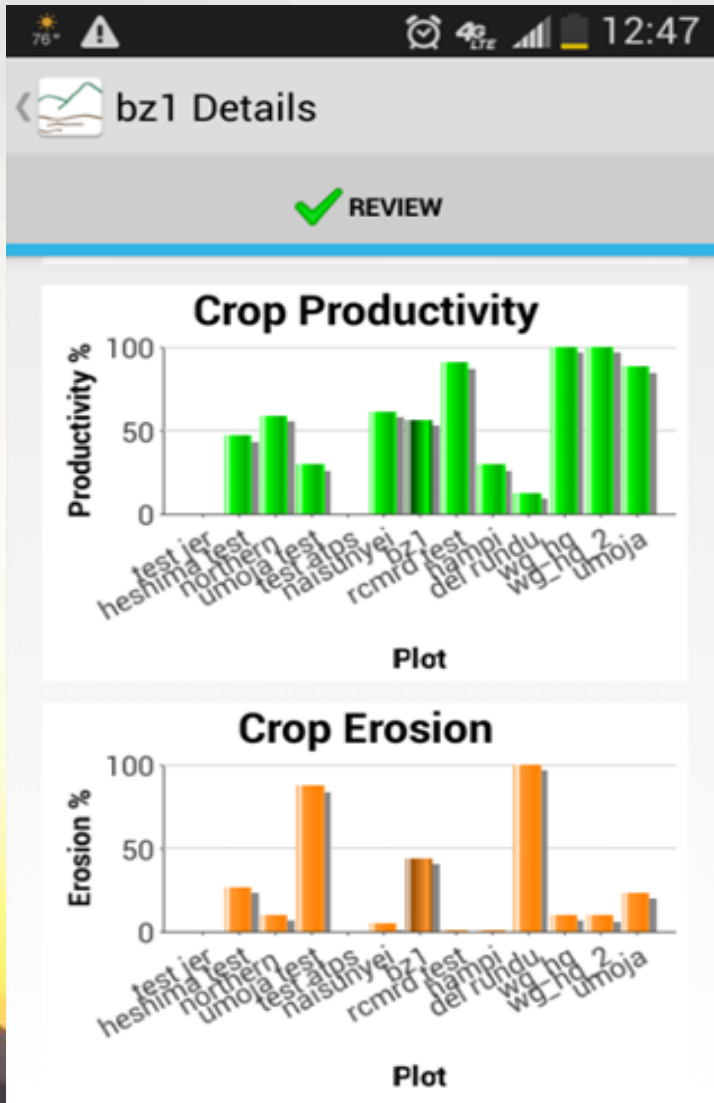
Data Collection Instruction. Embedded tutorials will guide the user through soil texture evaluations, land cover assessments, and photographing plot features.

Color Estimation. The application will integrate appropriate color algorithms into mobile phone camera functions to adequately measure soil color. Soil color measurements can help predict soil carbon and pH, and help provide more reliable productivity and risk estimates.

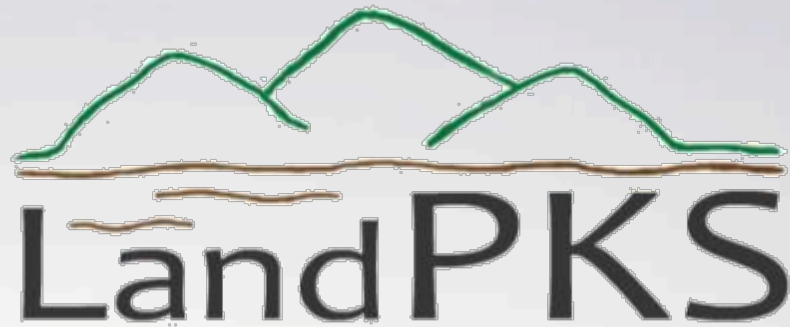
Analytical Modeling. User inputs are then uploaded to the internet and integrated with global climate and soils databases. The data is then run through predictive models to provide relative estimates of potential productivity and degradation risk. Graphical displays are delivered to the user's phone and formatted spreadsheets will be available via the web to allow for more detailed analyses.



OUTPUTS



Relative productivity estimates on LandPKS output screen



Questions?

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