



Training of Trainers (TOT) of Agricultural Extension Agents and Contact Farmers on the use of *LandPKS* Mobile App in Douala, Cameroon

Bridging Climate Information Gaps to strengthen Capacities for Climate Informed Decision-making

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Executive Summary

The African Technology Policy Studies Network (ATPS) successfully organized the *LandPKS* mobile app training workshop for farmers and extension agents at Parliamentarian Hotel in Buea, Cameroon on 10th October 2019. The workshop brought together about 50 participants (extension agents and farmers) from different regions of Cameroon to gain knowledge and skills on the use of the *LandPKS* mobile app for the collection of soil and climate information. The workshop aimed at creating awareness about the *LandPKS* mobile app as well as strengthening the technological capacity of extension agents and farmers to generate reliable soil and climatic information that can inform decision-making on sustainable land management and land use planning.

This report provides detailed proceedings of the *LandPKS* mobile app training workshop. The workshop sought to address capacity development needs in Cameroon. The strategy recognizes the need to build individual and institutional capacities to take advantage of emerging opportunities in the area of Information and Communication Technologies (ICTs) such as mobile phone technology to accelerate access to and application of reliable information for decision-making on agricultural production, land use planning and climate resilience.

The workshop provided a learning and knowledge exchange platforms for networking and discussion among extension agents and contact farmers on the use of *LandPKS* mobile app to support agricultural production and sustainable land management practices in the country. The training was successful in engaging farmers and extension agents to understand the collection, use and interpretation of climate and soil data, as well as know how to identify the different types of soils and the suitable crops for these soils. Participants at the training workshop were satisfied with capabilities of the *LandPKS* mobile app in providing accurate information on soils and climate. Participants also expressed confidence in the ability of the *LandPKS* mobile technology to contribute positively to the agricultural production and climate resilience in the country.

The training workshop also provided participants with an opportunity to provide feedback that may be useful in improving the features and performance of the app. Through this training workshop, we anticipate that participants especially extension agents will train other extension agents and farmers on how to use the *LandPKS* mobile app to collect soil and climate information and use the information to make important decisions on land management and planning.

1. Introduction

As part of the activities for component two of the Clim-Dev Special Fund (CDSF) project on “Bridging Climate Information Gaps to Strengthen Capacities for Climate Informed Decision-making”, the African Technology Policy Studies Network (ATPS) organized a training of trainers’ (ToT) workshop for extension agents and farmers on the use and application of the *LandPKS* mobile app in Buea, Cameroon. The workshop was organized in partnership with the Ministry of Agriculture and the University of Buea. The workshop aimed to build the capacity of participants to acquire knowledge and skills on the use and application of the *LandPKS* mobile app; farmers are able to collect soil and climate information through the use of the app to make farm management decisions. The *LandPKS* mobile app is a product of the Land Potential Knowledge System (LandPKS) project, which was developed through a collaborative effort by the ATPS and the United States Department of Agriculture’s Agricultural Research Service (USDA-ARS) and other partners.

This report provides an overview of activities at the training workshop including the expected outcomes of the workshop, and feedbacks from the participants. The workshop was designed to address capacity development needs in Cameroon by contributing to the development of individual and institutional capacities to gain knowledge and skills in the application of the *LandPKS* mobile technology so as to generate useful data and information that can effectively inform decisions at different levels to improve agricultural productivity, sustainable land management and climate change resilience. The workshop aligns with the Climate for Development in Africa Program (ClimDev-Africa), which aims to address the problem of lack of reliable climate information required for decision-making at all levels, bridge the gap between climate services and national development priorities and lastly, to establish a continuous flow of climate information between providers and users.

The training workshop responds to the growing concerns in many African countries on the need to rethink about current land use mechanisms, and to devise innovative measures that will ensure that the available land under agricultural production becomes more productive, sustainable and resilient to the impacts of climate change. It is now evident that efforts to increase agricultural productivity will not only come from land expansion and conversion, but rather the generation of accurate, robust, and timely information and knowledge of land potential will be key in supporting decision-making for sustainable land management and improved agricultural production.

1.1 Overall goal and objectives

The workshop aimed to build the capacity of agricultural extension agents and farmers on the use and application of the *LandPKS* app for the collection of valuable information (climatic and soil) so as to improve agricultural productivity. Specifically, the workshop:

- Introduced participants to the underlying principles of the *LandPKS* mobile app including the biophysical characteristics of soils, vegetation and the concept of land potential;
- Informed participants about the different features, components and characteristics of the *LandPKS* mobile app as well as the operation of the mobile app for data collection;
- Undertook participatory field demonstrations of *LandPKS* app with participants at a selected site and;

- Guided farmers on how to identify different soil types, their crop suitability and appropriate land management practices needed to contribute to improved agricultural productivity, sustainable land management, and climate change resilience.

1.2 Expected Outcomes

The expected outcomes for the training workshop were:

- Participants to deepen their knowledge of the biophysical characteristics of soils, vegetation and land potentials;
- Participants to gain knowledge of the *LandPKS* mobile app operation and its application in the field;
- Participants to utilize knowledge to make informed decisions on land use planning and farm management to sustainably increase agricultural productivity;
- Participants to have open access to the *LandPKS* mobile app at any time and anywhere;
- Participants to instantaneously access the best available information and interpret it in the context of local socio-economic conditions and local values, including crop preferences for a particular farm location; and
- Participants to contribute to future app improvement by providing valuable feedback to the app

2. Workshop Methodology

The workshop employed a participatory approach that consisted of classroom presentations, discussions and field demonstrations. The workshop entailed both theoretical and practical learnings that allowed participants to gain both theoretical and practical understanding of the *LandPKS* mobile app. (See ANNEX 1 for the workshop programme outline). As part of the training package, a training guide containing step-by-step instructions on the functionality of the *LandPKS* mobile app was provided for the participants.



A cross-sectional view of participants who attended the workshop training

3. Introductions and Expectations

The participants introduced themselves and provided their expectations for the workshop. Some went further to describe some of the challenges they have been facing and hoped that this tool will provide solutions to those problems. Participants listed the following as some of the expectations they hoped to realize from attending the training workshop:

- i) To gain knowledge on the *LandPKS* App and understand its practical applicability.
- ii) To know the availability and accessibility of the *LandPKS* mobile App to farmers and Extension agents.
- iii) How to use the *LandPKS* app to mitigate the effects of crop infestation and climate change.
- iv) To know how they can use the *LandPKS* app to improve their agricultural productivity.
- v) To acquire knowledge about the new technology and share it out with other farmers and extension agents as well as advise farmers on good agricultural practices.
- vi) To know the importance, relevance and benefits (socio-economic) of the *LandPKS* app to farmers, extension agents and other agriculture stakeholders.
- vii) To acquire knowledge on how they can assist farmers in the region.
- viii) To know more about the geographical coverage of the *LandPKS* mobile app (is it available country-wide).
- ix) To gain insights into how the *LandPKS* mobile app can predict rainfall patterns.
- x) To know if the *LandPKS* mobile app can be used as an information management tool.
- xi) To gain knowledge about the potential of *LandPKS* mobile app in order to enhance the agricultural value chain in terms of increased market access for farmers' produce and job creation for women and youth.

4. Functions and Operation of the LandPKS mobile app

By Dr. Ernest Acheampong, Senior Research Officer, ATPS

The *LandPKS* App is a mobile technology application produced from the Land Potential Knowledge System (LandPKS). The App allows individuals and organizations to use a smart mobile phone to determine land potential at a specific location based on local and global knowledge and information about the potential of similar types of land (i.e. land with similar climate, soils and topography). The *LandPKS* App currently operates on google android and iOS platforms, connected to a more sophisticated web tools that can be accessed via personal computers and linked with other decision tools.

Tapping into recent advances in cloud computing, digital soil mapping, Global Positioning System (GPS) enabled camera phones, the *LandPKS* mobile app allows users to enter point-specific information about soil texture, topography and easily observable soil properties and in turn obtain site-specific data including temperature, rainfall, estimated amount of water the soil can store for plants, and growing season length. The *LandPKS* mobile app can be downloaded at a google play store or iTunes store. It functions on both android and iOS platforms. Participants were taken through each interface of the app and how it functions.



Dr. Ernest Acheampong leads a presentation on the functionality of the LandPKS mobile app

5. Field Demonstrations of the *LandPKS* Mobile App

After the theoretical exposition of the *LandPKS* mobile app, there were field demonstrations on how the app works. This practical session provided a better understanding of how the app can be used in the collection of soil and climatic information. Participants were taken through the process of using the *LandPKS* mobile app to collect information from the field. Field data was captured into the *LandPKS* mobile app in following ways:

- Through an observational assessment of the land cover type, use, slope, slope shape, the occurrence of soil erosion, runoff and soil conditions.
- Up to 1 meter pit was excavated to identify the different layers and types of soil layers by examining the soil texture at different depths. Soil testing was done at different layers of 10 cm intervals (starting from 0-10 cm) from the top level soil to the bottom of the pit, soil texture analysis involved basic actions on soil texture analysis following a set of leading questions (with video tutorials incorporated in the app) that guide users on how to form a soil ball and make soil ribbons. By following instructions and prompts on the app, participants were able to test the physical characteristics of the soil and determine the type of the soil at different soil layers.
- Geo-referenced photographs are taken to serve as benchmarks for future monitoring.
- Based on the available information on soil generated by the *LandPKS* mobile app, a soil-crop matrix developed by the ATPS is used to assist farmers and extension agents to match the identified soil texture type with the most suitable crops.



Dr. Ernest Acheampong, ATPS Senior Research Officer leads participants in the field demonstrations

6. Conclusion

The increasing role and contribution of mobile phone-based technology towards the transformation of the agricultural sector cannot be underestimated. We have documented the proceedings of the *LandPKS* training workshop, organized by the ATPS in collaboration with the Cameroon Ministry of Agriculture. Participants showed positive response to the workshop and embraced the *LandPKS* mobile app as a valuable tool that can significantly impact on the country's agricultural production and land use management in the light of the challenges caused by the adverse effects of climate change. As a community-driven tool, the feedback and responses received from the participants will be vital in informing the future upgrade of the app. The ATPS will continue to monitor the progress of the adoption and use of the *LandPKS* mobile app in the Buea, Cameroon by engaging with the different stakeholders.



Mr Alfred Nyambane, ATPS Research Officer guiding participants in the field



Participants who attended the LandPKS Mobile App Training

ANNEXES

ANNEX 1: Workshop Programme Outline

LANDPKS TRAINING AND SENSITIZATION WORKSHOP
10th October 2019
PROGRAMME OUTLINE

08:00 – 08:30	Registration
08:30 – 09:00	Opening and Welcoming Remarks <ul style="list-style-type: none">• Prof Sylvester Ndeso Atanga-ATPS National Chapter Coordinator, Cameroon• Alfred Nyambane – Research Office, ATPS• Representative of the Governor of Buea
09:00 – 09:40	Introductions Teasers and Expectations from Participants
09:40 – 10:10	HEALTH BREAK/GROUP PHOTO
10:10 – 12:00	Introducing the <i>LandPKS</i> App Principles underlying the <i>LandPKS</i> app <ul style="list-style-type: none">• Functions and features of <i>LandPKS</i> App• How to use the <i>LandPKS</i> App
12:00 – 13:00	LUNCH
13:00 – 15:30	Field Demonstration of <i>LandPKS</i> App
15:30 – 16:00	Feedbacks, Responses and Comments
16:00- 16:30	Award of certificates
16:30- 17:00	Closing remarks and Departure

ANNEX 2: Photo Gallery



Participants keenly attempting to use the *LandPKS* Mobile App during field demonstrations



Participants feeling the soils during field demonstrations of use of the *LandPKS* Mobile App

ANNEX 3: List of Participants



ATTENDANCE LIST FOR THE LANDPKS MOBILE APP TRAINEES IN DOUALA CAMEROON

10th OCTOBER, 2019

N°	NAMES	STRUCTURE	SIGNATURE
1	MINKOMA ANNE PASCALE AUDREY	DDA-YAOUNDE	
2	NGUIMGO ALIKOU CLOTAIRE	DDA-YAOUNDE	
3	NYAMBIOH MBOUMTONI YVES THIERY	DDA-YAOUNDE	
4	TSENE BILOUNGA HANANI TRESOR	RDARD CENTER-YAOUNDE	
5	NGODESING EMILIA	RDARD NORTH WEST-BAMENDA	
6	FOADJIO NOTOUOM PAUL CHRISLAIN	RDARD WEST-BAFOUSAM	
7	NDOMO ESSIMI DIDIER GAETAN	RDARD EAST-BERTOUA	
8	TJEGA GUILLAUME	RDARD LITTORAL-DOUALA	
9	AKOUAFANE JEAN ERIC	RDARD SOUTH-EBOLOWA	
10	MOULE CECILE EPSE MEDJO RAWLING'S ABENE ESOROG	RDARD SOUTH WEST	
11	KUM JUDE KAWZU	RDARD SOUTH WEST	
12	EPOSI NDIVE GERALDINE	RDARD SOUTH WEST	
13	AJOACHA DORINE MBEBOH	DDARD FAKO	
14	TEZOH LAWRENCE	DDARD MEME	
15	ELUNGE NEE KOMENKWELLE MARY MUNGE	DDARD K.M	



16	LOBE ZIPORAH LOKENYE	DDARD NDIAN	
17	ETONE KWELLE GRACE	DDARD MANYU	
18	ESSE METUGE FRANCISCO <i>ESSE</i>	CDC	
19	HENRY NZUOBONTANE	PLANTAIN COOP	
20	AZIA GERALDINE ACHIA	SOWEDA	
21	BESSEM MARY TABE	AIVCDP	
22	BANGSI ONIELA	SOWEFCU	
23	HERMAN HOIGEN EK WALLA	LEBIALEM	
24	METUGE BRIDGET NYAKE	EXTENSION AGENT	
25	ENANG JAMES ENANG	SODECAO	
26	DR NGWABIE MARTIN <i>NCHIA Peter G.</i>	UNIVERSITY OF BAMENDA	
27	NKWATOH THERESE	UNIVERSITY OF BAMENDA	
28	MRS KPWE NADESH BEI	FEDEV	
29	MR TAMEH ELVIS NFOYAH	ANCO-CAMEROON	
30	DR YINDA GODWIN SENDZE	UNIVERSITY OF BUEA	
31	DR NKONGHO RAYMOND	UNIVERSITY OF BUEA	
32	PROF NDE NINGO	SMU BUEA	
33	PROF PIUS OBEN	UNIVERSITY OF BUEA	
34	PROF NKWATOH ATHANASIOUS	UNIVERSITY OF BUEA	



35	PROF ENOW TANJONG	UNIVERSITY OF BUEA	
36	PROF JANE AKOACHERE	UNIVERSITY OF BUEA	
37	PROF HALLE GREGORY EKANE	UNIVERSITY OF BUEA	
38	PROF NDE FON PETER	UNIVERSITY OF BUEA	
39	DR NDALEH WOZERA	UNIVERSITY OF BUEA	
40	DR NDE DONATUS	UNIVERSITY OF BUEA	
41	DR PATRICK SAMA LANG	IRAD-BUEA	
42	MRS SIRRI BELLA NGOH	IRAD-BAMENDA	
43	MISS TCHOUBA DANIE GAELLE	UNIVERSITY OF BUEA	
44	MR EKUNGWE CHRISTOPHER KANG	ATPS LOCAL ORGANISER	
45	MR KUM CHRISTIAN TEGHA	ATPS LOCAL ORGANISER	
46	PROF. NDESO SYLVESTER	ATPS CHAPTER COORDINATOR	

47 MRS. SHUKI HELEN ACTU FASA, UNIVERSITY OF DSCHANG

~~48 RAWLINGS NDEME-ESONG~~

48 Alfred Nyambane ATPS Secretariate

49. Ernest Achampong ATPS