



e-Agriculture Promising Practice

E-vouchers increasing the use of improved agricultural inputs in Mozambique



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Using technology to improve access
to agricultural inputs for smallholder
farmers in Mozambique

Key facts

- **Location:** Mozambique
- **ICT used:** E-vouchers and Internet Exchange Messaging Service (IEMS)
- **Area of work:** Staple crop production
- **Target group:** Smallholder farmers
- **Stakeholders:** Ministry of Food and Agriculture, Provincial and District Governments, Local Committees, Agro-dealers and FAO
- **Timeframe:** Agricultural campaign 2015/16 and 2016/17

For the first time in Mozambique, the Food and Agriculture Organization of the United Nations (FAO) in cooperation with Agro-Negocio para o Desenvolvimento de Moçambique (ADM) developed and tested the use of e-vouchers to facilitate farmers' access to seeds, fertilizers and other inputs needed to increase production and productivity.

The e-voucher system is a flexible market development tool that allows farmers to buy certain types of inputs from agro-dealers that accept e-vouchers as a partial payment.

The introduction of the e-vouchers was coupled with FAO's participative agricultural extension approach of the Farmer Field Schools to improve the adoption of the practice.

The practice was implemented in four provinces of Mozambique (Manica, Sofala, Zambezia and Nampula) from 2015-2017.



Context and problem addressed by information and communication technologies (ICT)

In Mozambique, although about 80 percent of the population depends on agriculture as the main sources of income, agriculture (including livestock, forestry and fisheries) is contributing to approximately 25 percent of the country's GDP.

With approximately 4 million farm units, responsible for about 95 percent of national agricultural production and cultivating an average of 1.5 hectares per family, smallholder farmers are responsible for ensuring a good part of the food and nutrition security in the country, in addition of employing about 81 percent of the labor force at national level. Agriculture provides farming households' main source of income, and supports nearly all of the household activities, but just barely.

Families consume what they grow, trade their farm supplies for other necessities and sell their crops for income. However households often fall short of their monthly needs.

“With limited market prospects, small-scale farmers find it difficult to access the much needed capital to invest to transition from subsistence to market – oriented farming”

Smallholder farmers in Mozambique do not use formal financial services such as bank accounts, mobile money or microfinance institutions and they often live too far from banks. The majority of smallholder farmers has never been in a bank and awareness about mobile money is still low.

Household finances are mainly managed informally and rely on local, informal lending, saving circles, or similar mechanisms. This practice aims to address the lack of access to financial support to facilitate farmers' access to seeds, fertilizers and other inputs needed to increase production and productivity.

In 2014, the Government of Mozambique and FAO agreed that targeted “smart subsidies” using e-vouchers coupled with a participatory agricultural extension approach, called FAO Farmer Field Schools (FFS) could be a powerful tool to facilitate farmers' access to inputs needed to increase production and productivity. The FFS is a FAO alternative approach that focus on strengthening farmer's and the rural communities' capacity in analysis of their production and in identifying their main constraints, as well as in testing possible solutions. By adding their own knowledge to existing information, farmers eventually identify and adopt the most suitable practices and technologies to their farming system.

FAO is aware of existing barriers that need to be removed to enable most of farmers' production potential. With limited market prospects, farmers and especially small-scale farmers find it difficult to access the much-needed capital to invest and to transition from subsistence to more market-oriented farming.



The e-card is the plastic ID the beneficiaries receive. The e-voucher is the complete system put in place, including the agro-dealers, farmers, e-cards, Government, FAO, etc.

The development of the ICT used: e-cards and e-voucher system

The e-voucher system is a flexible market development tool that allows farmers to buy certain types of inputs from agro-dealers that accept the e-vouchers as partial payment. The agro-dealers redeem the e-vouchers based on a settlement report that is produced every two weeks by the system. To avoid market distortions the prices of the inputs available at the agro-dealer's shops are in line with the prevalent market prices in the region.

The e-voucher scheme, the first of its kind in Mozambique, has been developed by FAO in cooperation with ADM1 tested in Manica Province during the agricultural campaign 2015-2016 and is currently used in Manica, Zambezia, Nampula and Sofala provinces, reaching over 23,000 beneficiaries who are also for the most part members of the FAO Farm Field Schools (FFS).

The use of the voucher mechanism started in 2013 with a "paper voucher" that offered limited flexibility. In particular, the "paper voucher" had pre-defined quantity and type of inputs that could be purchased, all inputs had to be purchased at once, the co-payment was made at once at the moment of the purchase and with high possibility of fraud as there was no PIN code nor biometric security measures in place. As a result of these limitations, the system was not well accepted by the farmers.

The first step towards the use of e-vouchers was to launch a tender for the design of a cost-effective method of electronic payment mechanism. Once the tender was completed and the service provider selected, FAO initiated the process of sensitization of beneficiaries, agro-dealers, Government and NGOs on the potential benefits of the system.

The beneficiaries were divided into two groups (subsistence and emerging farmers) and two different packages were designed to fulfill their specific needs (Package A for Subsistence Farmers and Package B for Emerging Farmers). Farmer's sensitization was done mainly through the Farm Field Schools (FFS). The implementation of the pilot system included the following steps:

- 1) **Selection of beneficiaries:** the Local Committee, based on the criteria agreed for the selection of beneficiaries, select and compiles a list of beneficiaries for the different packages (A or B).
- 2) **Registration process and distribution of e-cards:** the extension worker and/or the ONG collect and input all the information about beneficiaries (geographic location, age, gender, etc.) in the cloud system through the tablet. The e-voucher system requires also a biometric photo in case the beneficiary forgets the PIN code. After the registration, the beneficiary receives an electronic card containing information about her/his entitlements i.e. the technical package A or B (seeds, fertilizers).
- 3) **Co-payment and purchase of inputs:** the beneficiaries make the co-payment at the agro-dealer shops. Once the co-payment is complete, the e-card is activated and can be used for the purchase of inputs

- 4) **Assessment of the e-voucher:** at the end of the main agricultural campaign, an evaluation is made to analyze the gaps between registered beneficiaries, e-cards distributed and e-cards used for purchasing inputs and ways to improve the system. The assessment identifies issues related to time of delivery of e-card, availability of inputs at agro-dealers shops, problems encountered in using the e-card, how the co-payment was made, what need/can/how the e-voucher system be improved in the next agricultural campaign, etc.

Impact

The impact of the use of e-vouchers was supported by the fact that most of the beneficiaries are also members of the Farmer Field Schools where they learn to put new cultivation techniques into practice. With the use of improved seeds and new cultivation techniques, the beneficiaries of the e-vouchers increased their yields for maize from an average of 0.82 tonnes/ha to an average of 2.6 tonnes/ha.

The increase in numbers of vouchers exchanged along the years was also accompanied by an increase of beneficiaries moving from package A to package B. FAO observed a significant increase in the number of farmers who transitioned from subsistence to commercial farming. In the agricultural campaign 2016/2017 the preference for the package B was about 51% against 49% for package A. In 2013, 77% choose package A and 33 package B. The fact that in the agricultural campaign 2016-2017 over 16 700 farmers were willing to contribute to a total of approx. 640 000 USD indicates that they are convinced the e-voucher will help them to produce greater amounts of maize and beans. In the near future, it would be possible to integrate the e-voucher system with other types of interventions such as unconditional cash transfers. FAO's consolidated beneficiary database can reduce registration costs, minimize fraud and ensure transparency on the use of the funds allocated. It is also expected that the e-voucher will help in the management of other activities and services provided to smallholder farmers by State Institutions in cooperation with partners, and in the long-term, support in the development of an efficient private input distribution sector.

In fact, despite the number of financial institutions operating in the country, the level of financial inclusion in Mozambique is still relatively low (at the end of 2014, approximately 24% of the adult population had a bank account). In this context, the e-voucher represents a first step towards the inclusion of a rural population that has a low literacy level and does not have access to basic financial services such as bank accounts, savings and loans. Through the e-voucher system, beneficiaries improve their knowledge of electronic money and learn about its advantages in terms of security (i.e.: use of a PIN code and biometric data).

Innovation and factors of success

A smallholder farm is "small" because resources are scarce, especially land, and using it to generate a level of income that helps fulfill basic needs and achieve a sustainable livelihood consequently requires a high level of productivity, requiring in turn a significant level of investment.

A smallholder farmer can be profitable for a family if relevant investment are available for them to develop higher value crops, to process raw products, or to provide services to other farmers. The success of the practice was to create an enabling environment where the smallholder farmers could invest and increase production.

The introduction of the e-voucher has made it easier for smallholder farmers to buy quality inputs from a trusted source. The e-voucher also increased the efficiency and reliability of the existing paper voucher services. The transactions are now completely traceable and linked to the specific beneficiaries, which limits losses and fraud.

Challenges and constraints

The major challenge is the fact that traditionally, smallholder farmers in Mozambique are used to receive agricultural inputs free of charge both from the Government and/or from development partners. Although the inputs were, most of the times, of poor quality, it was challenging to convince farmers that by using improved and quality inputs, they could have a higher return in terms of production and productivity.

The use of demonstration plots through Farm Field Schools was the key to convince farmers. Luckily there were no apparent challenges related to the introduction of the ICT tool. The only issue encountered was beneficiaries forgetting the PIN and requesting the issue of a new one; this process was facilitated with the use of the biometric data collected.

A very important aspect of the whole e-voucher system implemented is the trust created between farmers, agro-dealers and inputs producers. If this system is to be adapted or replicated in some other countries, there is a need to ensure that the main stakeholders (farmers, agro-dealers and input producers) are willing to cooperate and collaborate for the success of the initiative.

In the 2016/2017 campaigns, women accounted for approximately 32% of all beneficiaries. There were noticeable differences within the provinces, with Sofala showing the highest percentage (approx. 53%) and Nampula/Zambezia showing the lowest (approx. 21%). This difference might be linked with the fact that the e-voucher is relatively new in these provinces. In addition the farmers, especially female farmers, have more difficulties in having liquidity to cover the co-payment and are not yet fully aware of the benefits of using improved inputs and production techniques.

Sustainability

FAO has noticed that smallholder farmers have the greatest appetite for financial mechanisms that help them afford agricultural inputs, such as seed and fertilizer. Given the fact that most smallholder farmers in Mozambique are involved in subsistence farming, the economic value for investing in them must be seen in terms of the size of the population. The direct involvement of the private sector (agro-dealers, input producers), is contributing to the sustainability of the approach.

The FAO project is supporting the e-voucher system for three agricultural seasons, after that, the Government of Mozambique, through the MASA, will ensure the continuation and up-scaling of the system. In this context, the sustainability of the e-Voucher system would be ensured both in terms of quality control of inputs provided and in terms of

increasing the percentage of the smallholder farmers participating in the e-voucher system in the country. The more the farmers participate, the higher will be the demand for improved inputs; consequently, there will be more competition among input producers and distributors that should reduce the market price of the inputs.

The overall cost (including software, hardware, technical assistance, subsidy, etc.) of the ICT solution is:

- For package A: approximately USD 62.00/beneficiary
- For package B: approximately USD 108.00/beneficiary

The average gross margin is:

- For package A: approximately USD 151.00/beneficiary
- For package B approximately USD 276.00/beneficiary

This is making the ICT solution affordable and the benefits worth the costs.

Lessons learned

- 1) The ICT solution proposed to smallholder farmers must be simple and user-friendly
- 2) There is a need to create trust between farmers and input providers. Farmers are willing to co-pay for the inputs if the quality is guaranteed
- 3) The success of the e-Voucher depends very much on capacity of the seed sector in supplying timely quality and quantity of seeds required by the farmers.
- 4) Market distortions inadvertently caused by Government, NGOs, UN Agencies must be avoided.

Replicability and upscaling

A pilot phase of the ICT solution was tested in 2015/2016 in one province and involved approx. 10 000 beneficiaries of the paper voucher. The results of the pilot convinced FAO and the Government to expand the ICT solution to four provinces of the country involving approx. 23 500 beneficiaries. The context of the new provinces was different as the farmers were not used to the paper voucher and much less used to purchasing improved inputs.

The Government of Mozambique now wants to extend the ICT solution to the whole country with a potential to cover over 4 million smallholder farmers. The Government of Mozambique will fund this. In case this happen, there will be a need for the commercial banking sector to integrate the ICT solution as the Government might not have the capacity to manage such a large investment program

Stakeholders

- Ministry of Agriculture and Food Security (main partner in the implementation)
- Provincial and District Governments (support in implementation at field level)
- Local Committees (sensitization, selection and of preparation of list of beneficiaries);
- Beneficiaries (receive e-card¹, make co-payment and use the e-cards);
- Agro-dealers (receive co-payment, activate e-card, control quality and sell of inputs);
- FAO (overall technical assistance and assessment of the impact of the e-Voucher)



Implementation in the different provinces of Mozambique

The programme is implemented in eleven districts of four provinces:

→ Manica (12 500 e-cards): Barue, Gondola, Manica and Sussundenga

→ Sofala (7 850 e-cards): Buzi, Gorongosa, Maringue and Nhamatanda

→ Zambezia (1 600 e-cards): Alto Molocue and Gurué

→ Nampula (1 200 e-cards): Ribaua

Farmer's story

Eduardo Lino, a local farmer beneficiary of the electronic voucher in Sussundenga, Manica Province, is excited about the new scheme. Already a beneficiary of the paper voucher, he understands the structure in which the beneficiary pays part of the total worth of the voucher, while FAO puts forward the rest. Once his electronic voucher has been activated, Lino has access to a wide range of inputs from any of the agro-dealers involved in the scheme. FAO carefully monitors the quality of the seeds available for purchase within this scheme, which Lino remarks is a significant advantage for him.

"I had a much better crop yield after using inputs bought with the paper voucher last year", he comments, and is hopeful that "the increase in input choices with the electronic voucher will again improve my production this season".

Another beneficiary of the paper voucher scheme preparing to transfer to the electronic scheme, Augusto Janota, attended a workshop on the electronic voucher FAO held in his home district of Manica, Manica Province: *"I have discovered that there is a much greater chance of my crops growing when I use the treated seeds of the FAO voucher programme, as well as the pesticides that come with the package,"* he noted during the workshop. *"I like this because outside the scheme I sometimes pay more money for really poor quality seeds".*



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Walter de Oliveira used to work at FAO in Mozambique and is currently working with FAO in Haiti.

He has over 23 years of professional experience in rural development focused on analysis of agricultural production systems and institutional capacity building.

He is highly experienced in providing policy advice and technical assistance to all levels of government on food security, agribusiness, value chains, Farmer Field Schools, voucher schemes and other rural development issues, in particular in facilitating south-south cooperation and public-private partnerships. He has a lot of experience in successfully managing long-term, multidisciplinary projects, and an in-depth knowledge of setting up and following project implementation management structures.

Resources

Website and further resources can be found on the webpage of FAO Mozambique:
<http://www.fao.org/mozambique/en/>

For more information on the Farmer Field School (FSS) approach from FAO visit: <http://www.fao.org/farmer-field-schools/en/>

E-AGRICULTURE CALL FOR GOOD AND PROMISING PRACTICES

This document was developed in the framework of the 2017 e-Agriculture Call for Good and Promising Practices on the use of ICTs for Agriculture and Rural Development in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and the Technical Centre for Agricultural and Rural Cooperation (CTA).

e-Agriculture is always happy to review your good or promising practices! You can submit a proposal, following the sections in this document to e-agriculture@fao.org
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Good and Promising Practices on the use ICT for agriculture in collaboration with

