



Motivation

Ghana's agricultural production meets only half of domestic cereal and meat needs and 60 percent of domestic fish consumption, according to the Ministry of Food and Agriculture (MOFA), the Abuja summit on fertilizers from June 2006 declared that Sub Saharan Africa can only increase food production and alleviate poverty when fertilizer use is increased. Zalerigu village is a village in rural Ghana, where the idea of this use case comes from. The Farming Officers are experienced farmers that visit the villagers in Zalerigu village every once in a while, to give instructions and to award prizes to the best farmers in the area. With those instructions, farmers have been able to increase their harvest. However, after a while, farmers tend to forget how to properly apply the fertilizers, and the harvest fails. Hence, it would help them if they could continually access the information that the Farming Officers provide. Farmers need to know which fertilizers they should use for a particular crop. Therefore, we developed a system that provides farmers this information.

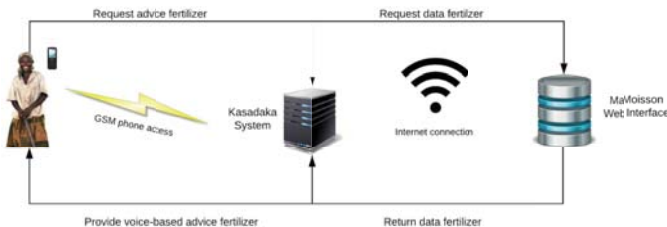


Kasadaka System



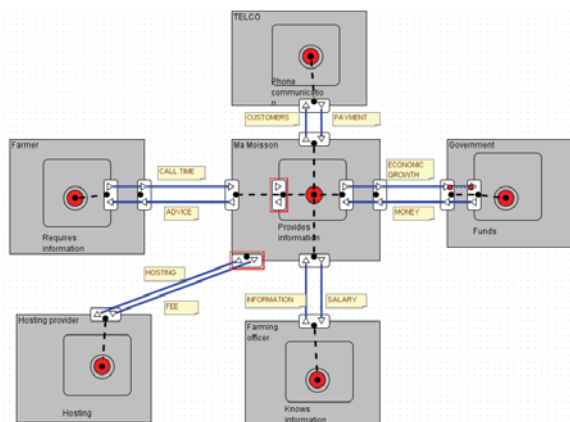
The Kasadaka is an inexpensive voice-application sever, developed specifically for rapid-prototyping under rural conditions. It consists of a Raspberry Pi, a USB-Dongle that connects to the local GSM network and a Waka Waka solar battery. The server is powered by Linux and runs an open source framework for building (voice- based

communications applications. The cost of this hardware device is currently 100 EUR. The Kasadaka is tested under rural conditions with no internet connection, temperatures up to 42 degrees Celsius in the shade, electricity outages, and using local mobile networks in Ghana.



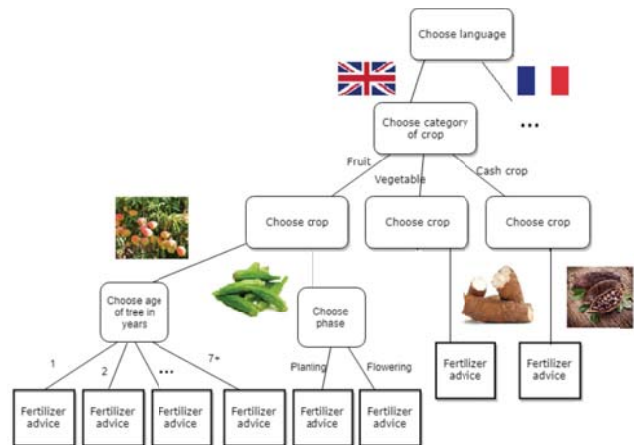
Business Model (e³ value diagram)

The Value Web of *MaMoisson* with funding provided by the government. The incentive that the government has to invest is market and economic growth. In this business model, the government funds *MaMoisson* and assigns Farming Officers to maintain it and update the information it provides. In turn, *MaMoisson* advises farmers on the information they require. Revenue is also generated from payments by telecommunications providers, which will pay *MaMoisson* for the customers that call the service. An expense that *MaMoisson* has is the hosting fee paid to the hosting provider. With this business model, the end-users are able to get government recommended advice through the Farming Officers, however sustainability may be questionable, as other government funded projects have failed in the past.



MaMoisson Application

Being up to date with newly introduced, promising fertilizers, is absolutely critical to the success of a harvest. In the recent years, organisations have created fertilizers that are made for specific crops. Whether a farmer is harvesting cash or food crops, it is necessary to have the information that will produce the optimal yield.

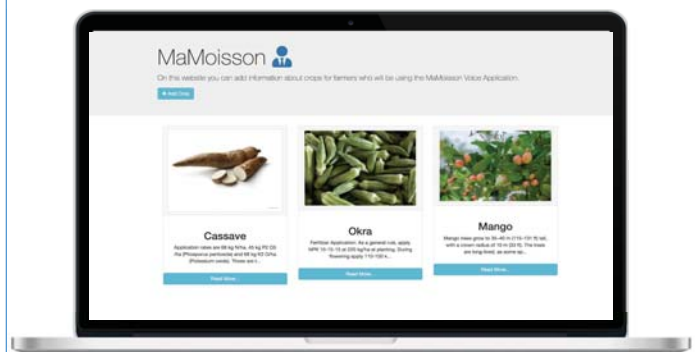


Farmers call *MaMoisson* and select first the category of the crop they are harvesting and, second, the crop itself, and possibly the age or phase of the crop, upon which the system gives an advice on the fertilizers that they should use and in what amount. The information in the system is to be provided by the Farming Officers, who know about (new) fertilizers. All data is stored in a database and is accessed via a database management system. We developed a web interface, that makes it easy for Farming Officers to enter the data.

Example fertilizer advice:

For a mango tree of 4 years, we recommend to use between 2.0 and 4.8 kg of NPK 15-15-15 per year, in a 2 split application.

For okra: as a general rule, apply NPK 15-15-15 at 220 kg/ha at planting. During flowering apply 110-150 kg/ha of Sulphate of Ammonia or 75 kg of Urea.



Possible Expansions

- Add current price of fertilizer.
- Add contact details of fertilizer supplier.
- Make fertilizer advice dependent on region, soil or other factors.
- Add local languages.
- Allow farmers to upload information.