

on various aspects of E-Agriculture such as software use and management, soil testing, as well as business management, with technical support from Grameen Intel Social Business Ltd (GISB -www.grameen-intel.com), and facilitated by IFAD. Among the participants were various government officials, including senior soil scientists from both regional and national level soil management institutions of the Government of Nepal (GoN). Most importantly, the required tools such as laptop, soil testing kit and a device for internet connection were provided to the LSPs.

The software was in the English language which provided difficulties for the LSPs and farmers to use. Hence, HVAP translated/localized the eAgro Suite in Nepali language.



Status of nutrition requirement recommended by Mrittika

Now, the package is easy to use and understand. Mrittika is one of the programmes of eAgro Suite which is being practiced in the field. It can recommend the use of organic fertilizer and based on the results farmers select their crops. However, farmers should mention PH, Nitrogen, Phosphorus, and Potassium level, type of land (low or high land) and type of crops in Mrittika software. Based on these available inputs, the software recommends the need or requirement of nutrition for specific crops. Currently, the farmers are growing off season vegetables such as tomatoes, peas, cauliflower and cabbage while using organic fertilizer as per the recommendation of software in Surkhet district.



Local Resource Person-Dipak Thapa working on the software (data entry)

HVAP, with support from the Soil Management Directorate and the Regional Soil Lab in Surkhet, has accepted these challenges. After further refining of the four software applications for local use and studying its effectiveness for at least one cropping cycle, the initiative will be scaled-up to other districts. Now, the project is in the process of using rest of the applications i.e. ānkur, protikār and vistār in the field at the same communities.

With the use of E-Agriculture, we can maximize the use of ICT as an instrument to improve production (quality and quantity) and reduce trend of using unwanted fertilizers in the project areas. There are successful stories on E-Agriculture from India and Bangladesh, where evidenced increased productivity



Soil Testing on the field- Local Resource Person-Karna Bahadur Raskoti, Sanosurkhet

recorded as much as 300 percent. Even in HVAP, the project has received a positive response from the farmers; they became familiar on soil chemistry, crop nutrition and crop selection to grow on specific land fulfilling nutrition requirement. From those perspectives, It has not only increased their confidence but also played vital role to collect, process and disseminate agriculture information at grassroots level. The technology gave new hopes to the farmers to adapt to the changing climatic condition. HVAP will expand the use of E-Agriculture by integrating it within the business and market relationships established in the project while documenting and incorporating the farmers' experiences. In this way, the project will serve as a catalyst to improve rural livelihoods in mid and far west Nepal.



Soil Test Result showing by Local Resource Person-Sarada Thapa, Uttarganga, Surkhet



Government of Nepal
Ministry of Agricultural Development
**High Value Agriculture Project in
Hill and Mountain Areas
(HVAP)**



Next Steps

While the ice has been broken, much more work still remains. For accurate results, the four software applications depend heavily on the localised information and data. These are related to the regional ecology, type of seeds and fertilisers available and other inputs from local agriculture experts. The applications also depend a great deal on the accuracy of the soil test results carried out by the LSPs.



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*E-Agriculture: Technology Based Agri-Solutions
(HVAP Experiences)*



Context

Agriculture is the main stay of Nepalese people. Around two-third of the population directly depends upon agriculture to sustain their livelihood. In the current Three Year Plan ending in July 2013 the Government of Nepal (GoN) stresses commercialization of Agriculture through farm mechanization, infrastructure development and access to agriculture inputs and tools. Use of ICT (information and communication technology) in agriculture commercialization can be a vital component for this. Although more than 80% (18.9 million) of Nepalese people have access to telecom services, the use of information and communication technology in agriculture sector is underdeveloped. The increased access of communication tools such as mobile phone, radio, and email internet massively changing the rural potential for ICT services. Hence, if we work on the promotion of ICT in agriculture like E-Agriculture based services it would surely add glitter to the gold. Basically, the ICT would link the farmer to modern extension services, technologies and markets.

What is E-Agriculture ?

E-Agriculture is a global initiative to improve agricultural practices, and it involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICTs) in agriculture. Most importantly, It plays an important role in agriculture value chains while using different type of software packages having different strength and weakness when applied to particular interventions.

Given the importance of the context, HVAP tested eAgro Suite as a technology of E-Agriculture which has four software applications – ānkur, mrittikā, protikār and vistār. The software was developed by Grameen Intel Social Business Ltd, a company formed as a joint collaboration between Intel Corp and Grameen Trust. With the intention of allowing rural entrepreneurs to provide improved agriculture extension services in their local communities, the applications are designed to generate detailed recommendations on fertilizers (mrittikā), seeds (ānkur), pest and disease control (protikār), and finally, marketing strategies (vistār).

Types of Software

Ankur: is a seed selection and recommendation application that analyses the season and farmer's land condition to prescribe the best seed. It offers knowledge based and customized information to the farmers on crop, soil type and season based seed selection, recommends for seed preparation and planting and recommends seeds that offer competitive produce prices.

Mrittika: is soil nutrient analysis and recommendation software that helps to achieve optimum productivity at the lowest cost. It offers knowledge based and customized information to the farmers on nutrient requirement of specific crops. It specifies the appropriate fertilizer type, dosage, and application process and it recommends local sources of fertilizers that offers competitive prices.

Protikar: is software for preventing plant diseases, weeds and pest organisms that damage agricultural crops. It offers knowledge based and customized information to the farmers on preventive measure to avoid plant diseases,



Four major software of eAgro Suite used in HVAP

determine the need for specific pesticides, prescribe application procedures and identify locally available pesticides, enabling farmers to produce better crops-disease tolerant.

Vistar: is a software application that helps farmers to get direct access to market or buyer information so that they can sell their crops at optimum prices. It offers market information to the farmers on prices and required harvesting seasons ,

Source: <http://www.grameen-intel.com/>

Why Do Farmers Need E-Agriculture?

Farmers in Nepal face various constraints related to the use of appropriate fertilizer, soil management, and selection of suitable crops, health and quality of crops. Farmers get inadequate information about these challenges or some even do not get any. The lack of market information has hindered smallholders to enter the global market. The agriculture experts,

scientist, and other service providers are mostly available in the urban areas, leaving the remote farmers without any advisory services. Hence, E-Agriculture has the potential to be an effective means to solve above stated challenges.

HVAP Experiences

The High Value Agriculture Project in Hill and Mountain Areas (HVAP) started E-Agriculture as a means to provide services for farm improvement. Since Feb. 2014, It is

jointly supported with the International Fund for Agriculture Development (IFAD) and The Grameen Intel Social Business Ltd (GISB). Prior to the piloting, HVAP provided orientation to the smallholders about the use and benefits of ICT in order to drive greater food security, job creation and long-term economic growth for farmers and their families in the HVAP project areas.

As a means of E-Agriculture, HVAP has been practicing eAgro Suite technology at four communities in Surkhet district. HVAP has localized the software and the application of mrittika is being used at four communities at present. These applications have been tested in Bangladesh and India, with immense benefits in improving productivity and farm incomes. In fact, the applications allow the multitude of local smallholders to be connected to the rest of the value chain, learn about the best practices,

and access reliable input supplies such as quality seeds, fertilizers and pesticides. Furthermore, the improved connectivity also allows farmers to pursue better prices by transacting with multiple buyers. According to recent reports, the fertilizer recommendation software, mrittikā, can help double the yield of winter crops. Based on local information input into the system – such as land type, size, season, irrigation, soil characteristics through soil tests, and others – the software applications help farmers identify the best type, optimum amount and appropriate method of using fertilisers, seeds and pesticides. As a result, farmers can not only maximise productivity, but also reduce costs by minimising waste. For this, the trained E-Agriculture persons (local resource person) should timely update farmers' information in the software. The updated information is stored in the information management system of GISB in Bangladesh.

We were not familiar with soil conditions. With the help of the technology, we know now about the particular use of different fertilizer at various scales. It has not only increased our knowledge but also reduced our dependency of district based agriculture experts. While using fertilizers as per the software recommendation, we found crops much healthier and disease tolerant. We are HAPPY and found that the technology has assisted us to solve various agriculture related problems and we anticipate that it will surely increase our agriculture production and productivity in the coming days.



- Manjali Garamja – Farmer, Pinghale, Surkhet

How is this Accomplished?

The pilot phase of the HVAP E-Agriculture Initiative started in the four villages: Pokharikanda, Uttaganga, Sano Surkhet and Melkuna in Surkhet district while providing technical orientation on the use and application of E-Agriculture to the lead farmers, Junior Technical Assistant (JTA) and agrovets. The initiative begun with a five-day training

designed towards introducing information and communication technology (ICT) as a promising way to help farmers make smart use of the limited resources available to maximise productivity and profits. Eight participants from four agricultural cooperatives and groups were selected as the first Local Service Providers (LSPs) of these technologies. They were trained

