

Organic Veggies in Your Inbox!!

Promoting sustainable practices in organic crop production, value addition, and supply chain for GORUS, a collective of small organic farmers in Pune (India).

18 Apr 2013

Preliminary Project Report

To begin with, Gomukh Trust (Pune) and Gorus Organic Farming Collective wish to thank **The Amber Foundation** for their generous financial support. Financial assistance received from The Amber Foundation (Freiburg, Germany) has enabled Gomukh Trust and Gorus to make key investments for improving the communication with farmers, improving database management and enhancing the overall efficiency of backward and forward supply chains.

Funds from The Amber Foundation were received on 23 Nov 2012. Work on the proposed activities began in Dec 2012. The status of the five activities being implemented under this project is follows:

a) Streamlining communication with farmers through use of mobile phones

In order to streamline communication with farmers and improve overall efficiency, we need to:

- (i) know exactly what is happening on each of the 30 farms which supply organic farm produce to Gorus;
- (ii) understand the farmer's needs/ problems regarding pest and disease management, crop nutrition, problems related to a sudden change in weather, etc., and respond immediately by giving the right information/ solution to the farmer.
- (iii) be able to predict the crop-wise supply trends with reasonable accuracy in order to bring more consistency to our CSA home-delivery model.

For doing this, we needed a phone that has the ability to take photos (at least 2 megapixels camera), send and receive multi-media message (MMS), and internet capability. After comparing several cameras on Flipcart.com (the Indian version of Amazon) we have selected the Micromax X50 model which fits the budget and has the necessary features for use in rural areas under rugged conditions:

Micromax X50 (Rs. 2199 / €30)



Dual SIM GSM + GSM	2 Megapixel Camera	28MB Memory	MMS Enabled
Audio Streaming	Email	Pedometer	UV Detection
Barometer	Thermometer	Shock Proof	Water Proof
E-Compass	Dual LED Torch	Digital Recorder	

In order to do a pilot run, we have purchased two mobile phones, wherein one was given to Mr. Sarjerao Chaudhari (organic farmer from Pabal village) and one is kept with Mr. Bablu Jangam at Gorus office in Nanegaon.

Communication steps:

- Once a week (every Saturday morning), the farmer takes 2 photos of each crop (one close-up and one long-shot) and sends it via MMS to Gorus office.

The close-up photo will reveal the presence or symptoms of pests and diseases, stage of the crop growth, general health of the crop, etc. The long-shot will indicate the overall condition of the farm, showing whether the weeds have been removed, whether farmer has done mulching, the spacing between plants, whether he has planted any inter-crops, etc.



Close-up



Long-shot

- Photos sent by the farmer are downloaded from mobile phone into a laptop at Gorus office.
- Folders are created for each farmer and photos are grouped by:
Farmer name/Location/Crop name/Date
- Photos sent by the farmer are reviewed on the laptop by zooming-in or zooming-out as required, and the visual information is interpreted and converted into text / data (refer to Table 1) that is useful for market planning or for providing timely solutions/ advice to farmers. The interpretation is double-checked by calling the farmer if necessary.
- If urgent steps need to be taken for pest or disease management or crop management in general, the Gorus co-ordinator will directly call the farmer and explain it to him. The names of pest management inputs, recipes of herbal extracts, etc. will be sent via text message.
- Over time, the photo database will also be useful to create “crop production models” as well as for educating new farmers regarding organic crop management.

At present, the process is being done manually, with the objective of understanding what type of functions would be needed if a software programme has to be written for this. In January 2013, we had a meeting with some of the farmers in the collective, to discuss how the mobile phones and photos could be used for improving the communication and efficiency of our activities.



Ashwin Paranjpe and Vaghu Phale of Gorus discussing the Mobile phone system with farmers.

Gorus had already purchased a software in 2010

which has the ability to send text messages from MS Excel to mobile phones. This software can be used for sending automatic messages to farmers regarding crop management during different stages of crop growth. Also, the information received through this system needs to be linked with the backward and forward supply-chain database which will help us plan inbound and outbound logistics

Table 1. Conversion of photos (visual information) into text / data for decision making regarding organic crop production & supply chain.

Farmer name	Sarjerao Chaudhari									
Location	Pabal, MH									
Crop name	Chilli									
Area planted	1000 sq. ft.									
Sowing/ Transplanting Date	05/03/2013									
PHOTO DATE	02/04/13	09/04/13	16/04/13	23/04/13	30/04/13	04/05/13	11/05/13	18/05/13	25/05/13	ROW TOTAL
Crop-stage	FL	FR	FR							
Pests symptoms observed	1 (thrips)	0	2 (aphids)							3
Disease symptoms observed	0	2 (powdery mildew)	1							2
Nutrient deficiency observed	0	1	1							1
Weeding status	0	0	1							1
Irrigation status	0	0	0							0
SCORE	1	2	5							
Mulching needed	Y	N	N							
Trellising needed	N	N	N							
Pruning needed	N	Y	N							
Weeding needed	N	N	Y							
Spraying for insect control	Y (Neem extract)	N	Y (Neem extract)							
Spraying for disease control	N	Y (Garlic extract)	Y (Garlic extract)							

Key:

Crop stage: G (germinated, with first true-leaf appearing) FL (flowering) FR (fruiting) S (senescing)

Pest intensity: (0 – 3) where 0 = no pests; 1 = needs preventive sprays; 2 = needs curative sprays; 3 = damage is difficult to control.

Disease intensity: (0 – 3) where 0 = no disease; 1 = needs preventive sprays; 2 = needs curative sprays; 3 = damage is difficult to control.

Nutrient deficiency: (0 – 3) where 0 = no deficiency; 1 = needs slight nutrition; 2 = needs substantial nutrition; 3 = malnourished crop, difficult to recover.

Overall crop growth: (0 – 3) where 0 = very good crop growth; 1 = fair crop growth; 2 = good crop growth; 3 = unsatisfactory plant growth.

Weeding status: (0 – 3) where 0 = no weeding needed; 1 = needs weeding; 2 = needs urgent weeding; 3 = too many weeds, difficult to control.

SCORE: (0 - 2) = Very Good (3 - 5) = Satisfactory (6 - 10) = Measures needed (10 - 15) = Urgent measures needed.

as well as the marketing of fresh produce in a better way. However, all this is possible only if farmers regularly send their photos to Gorus office via MMS. During the pilot, we realized that farmers need to be trained in how to shoot the photos so that the photo can be properly interpreted. A photo which is not taken properly can convey the wrong impression or no information, thus resulting in a waste of time and money. The next step is to purchase 28 mobile phones by the end of April and train the farmers in taking the photographs properly, sending MMS, and text messaging. Simultaneously, we will work on database management mainly using MS Excel platform. We might need another two to three months to properly integrate the whole system.

b) Improving efficiency through database management

Mr. Ajit Kharade who is currently pursuing a bachelor’s degree in commerce has been working for Gorus (part-time) since one year. Ajit lives in Pune city but he is originally from the same area where Gorus has its packing house. Through the grants received from this project, Ajit has completed a basic course in Tally accounting software.

Tally (www.Tallysolutions.com) is an accounting cum inventory management software developed by an Indian company. Ajit still needs to do the advanced course before we can fully deploy this software for Gorus activities.

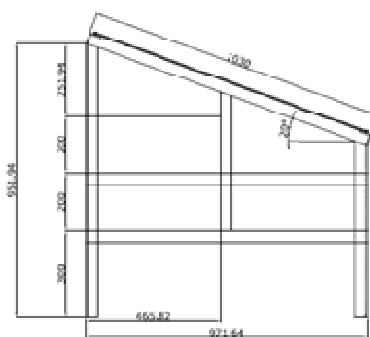
Since it will be difficult to integrate Tally software with the photo database, Tally will be used primarily for accounting and inventory management, which will significantly improve the overall efficiency of Gorus activities. Also, the laptop purchased through this project now enables Ajit to do the weekly data entry at Gorus office in Pune city, plus on home-delivery days, it enables him to do the billing and inventory management at the packing house in Nanegaon, thus increasing his mobility and improving the overall efficiency of data management.



Ajit entering the weekly data into the laptop computer at Gorus office in Pune.

c) Low-cost solar dryers for value addition

Sun-drying adds value to farm produce that is otherwise wasted. At present, Gorus has about 5-10% extra production of green leafy vegetables, tomatoes, fruits, etc.. As part of this project, we have developed a new “box-type” solar dryer in collaboration with Mr. Amod Deshmukh of Pune Renewable Energy Systems (<http://pune-renewable-energy.com>). The design was provided by Mr. Amod Deshmukh and the entire prototype was built at Gorus farm by our staff members.



Gorus Solar Dryer (elevation)



Gorus team with the solar dryer... it's finally ready!!



Judit checking the tomatoes before sunset...



Bablu welding the tin sheet to metal frame of solar dryer



Mr. Amod Deshmukh giving the finishing touches...



The beginning... Mr. Amod Deshmukh discusses the design with Gorus team



Welding the frame of the solar dryer at the Gorus workshop

Salient features of Gorus Solar Dryer

Capacity:	15 kg fresh product per batch
Size:	L = 2m, W = 1m, H = 0.95m
Material of construction:	Structure: Mild Steel & MS sheet, Top: toughened glass
Air circulation:	Two fans (12 V – 7 watt x 2 nos.); power supply from solar panel (15 watts).
Heat retention:	up to 2 hrs after sunset, no need to remove the product at night.
Basic cost:	INR 15,000/-

The box-type solar dryer turned out to be a success, and we have already started making the second prototype, with square tubes (instead of 90 deg. angles) and better doors for improving the heat retention. Although a tunnel-type solar dryer was envisioned in the proposal submitted to The Amber Foundation, we have finally decided to make another box-type solar dryer from the available funds.

Gorus is drying a wide variety of vegetables and fruits in the solar dryer:



d) Bakery oven (heated using biomass fuel-pellets)

Most small-scale bakery ovens available in India run either on electricity or LPG, and both options are expensive. The prices of LPG and electricity for non-domestic use have increased significantly, and will continue to increase in future as the government is slowly rolling back the subsidies on these commodities. The village where Gorus is located is producing biomass fuel-pellets which are 50% cheaper as compared to non-subsidized LPG or electricity.



Mr. Amod with the bakery oven and biomass pellet-stove.



Mr. Lakade (standing left), owner of Subhadra Scientific & Surgical Co. Pune, has helped in fabricating the bakery oven. Mr. Lakade and his father specialize in making ovens for small enterprises.

As part of this project, we have developed a bakery oven which is heated using biomass fuel-pellets. The entire design and fabrication has been done by Mr. Amod Deshmukh of Pune Renewable Energy Systems. The oven fabrication is complete, the biomass stove is ready (Gangotree 1 kg model) and now the heat distribution funnel and pipes are being fabricated. We need another two weeks to complete the piped heat-transfer system for the oven. The oven will enable Gorus to use the surplus wheat, oats, and millets for making top quality breads, nutritious millet-biscuits (rich in Fe, vitamins, fiber & minerals), etc.

To our knowledge, this is probably the first bakery-oven in India which will work exclusively on biomass pellets.

Advantage of using biomass fuel pellets (instead of LPG):

Energy equivalence: 1 kg LPG = 3 kg biomass pellets

Price of 1 kg LPG (non-subsidized) = Rs. 90/kg

Price of 1 kg biomass pellets = Rs. 15/kg

That is, 3 kg biomass pellets costing Rs. 45 will replace 1 kg LPG (which costs Rs. 90/kg).

Thus, on a per kg basis, the biomass pellets are a green, renewable, and carbon-neutral fuel alternative to LPG and can save 50% cost as compared to LPG.

e) Seed Bank

Availability of good quality organic seeds is a major limitation for the mainstreaming and growth of organic farming in India. Thus, we have started a seed bank where indigenous seed varieties of vegetables, cereals, millets, pulses, and fruits are maintained. Farmers in the collective are able to use seeds from the seed bank on the principle that they return 1.5 times the quantity they borrow.



At present, our seed bank has the following varieties of seeds that have been grown organically and saved by farmers in our collective:

- | | |
|---------------------------|----------------------------------|
| 1) Corn (white, sweet) | 13) Soy bean (black) |
| 2) Spinach | 14) Okra (short green) |
| 3) Onion (red) | 15) Lettuce (Oak-leaf) |
| 4) Mustard (small red) | 16) Lettuce (Summer marvel) |
| 5) Radish (white long) | 17) Rucola |
| 6) Carrot (red long desi) | 18) Dil |
| 7) Cow-pea (yellow) | 19) Pumpkin (red, round) |
| 8) Cow-pea (red) | 20) Coffee (Arabica) |
| 9) Fenugreek | 21) Passion fruit (yellow round) |
| 10) Coriander | 22) Tomato (red cherry) |
| 11) Amaranth (red) | 23) Brinjal (long purple) |
| 12) Amaranth (green) | 24) Chilli (Bedgi variety) |

All seeds are cleaned by passing through a sieve and stored in glass jars. Two seed registers are maintained: Incoming Seed Register and Outgoing Seed Register. Although our seed bank is quite small right now, each year, the inventory will increase and our eventual goal is to form a network of seed savers across India.

Endnote

This is a Preliminary Report submitted to The Amber Foundation. Some of the activities planned in this project are still in progress. These activities will be completed by the end of Jun 2013, and a Final Report will be submitted to The Amber Foundation.

We have acknowledged The Amber Foundation and have uploaded brief information about this project on the website of Gorus Organic Farming Collective: http://gorus.in/Project_Update.html

We will also acknowledge The Amber Foundation for their support on the website of Gomukh Trust (www.gomukh.org) in a few days as soon as the webmaster is available.