



## INTELLIGENT ADVISORY SYSTEM FOR FARMERS IN NORTH EAST INDIA

### CONTEXT

North East India is geographically diverse and many farmers depend on subsistence farming, totally dependent on the weather and sometime on luck, to make ends meet. Frequent crop failures are the rule rather than the exception. Plagued by illiteracy, militancy, poor access to resources and low purchasing power, they are often left out of the beneficiary net of the State government. Being more often left at their wit's end, they have no one to turn to but to fend for themselves, in case of impending crop failures. This is compounded by the fact that majority of small and marginal farmers are without any risk cover from insurance companies. The question I often asked myself is “Can ICTs help bring some change in the agricultural situation of such needy farmers? Can ICTs take precedence over other developmental interventions and can scarce resources be diverted for these?”

The challenge of meeting immediate needs/priorities are overwhelming to development planners and therefore provision of tangible and short term benefits often takes precedence over development of knowledge and skills which have more lasting impacts. Instead of transforming ourselves into vibrant knowledge dispensing entity of the 21st century, development agencies often end up playing the role of an “input supplier”. After 21 years of experience in the development sector, I am of the view that it may not be a far fetch idea to envision a future where ICT can be a game changer and a knowledge engine

driving government departments to ensure need based, efficient, timely, transparent delivery of information, knowledge and services to assist resource poor farmers get their fair share of development. Open Source platform combined with responsive extension personnel, can form an ideal partnership to bridge the huge gaps that exist in the agriculture development paradigm.

## **IASF**

During the year 2010, C-DAC (Centre for Development of Advanced Computing) Mumbai, under its North East India initiatives sanctioned a project on harnessing ICT for the farming communities of North East India. Funded by the Department of IT (DEITY) this project [Intelligent Advisory System for Farmers](#)” (IASF) aimed to leverage C-DAC’s core strength in artificial intelligence (AI) algorithm which uses Case Based Reasoning (CBR) from projects like “Vidur” to solve present problems based on past experience (cases), mimicking human problem solving methods. C-DAC subsequently approached Department of Agriculture Meghalaya to collaborate on the project and to share domain knowledge, which was, in principle accepted in order to provide farmers in Meghalaya with an opportunity to get internet based diagnostic and expert services for crop pests and diseases in the field.

IASF was launched in Meghalaya on 29th November 2012 with the following objectives:

- Provide improved services to the farming community through the use of ICTs.

- Advise and help farmers to solve problems related to their farming activities. (Otherwise, they need to contact agricultural experts and private extension workers).
- Provide vital and generic information to farmers so that they get periodic alerts on important/useful tips, ideas, knowhow etc.
- Update farmers on latest agricultural technologies for improved productivity and quality farming.
- Develop an advisory system which can be extended with any other types of crops in any State of India.
- Improve agricultural extension service by using mobile services so that farmers can send queries about their farming problem from their mobile device.
- Develop educational materials to be used by students for their practical experience with real case scenario.

### **Box 1: IASF**

IASF is a very unique project and the first of its kind in India which uses web services with seamless integration to national Mobile Service Delivery Gateway (MSDG) via push and pull SMS, thereby linking farmers with agricultural experts from the agriculture department and KVK agricultural specialists in real time. The dashboard gives a 360% view of all the processes and the administrator is kept informed both by email and SMS about the various events in real time. Both farmers and experts are registered in the IASF database. Only agriculture experts with relevant Master degree and PhD with not less than 5 years experience are registered to provide solutions to the registered farmer's web query as well as SMS based query. The all India 51969 short code is used for all mobile services.

Registered farmer can login to the system to use the web interface to connect with agriculture experts via a structured module. They can also directly link to expert via direct query and upload photographs (upto 3 MB size). Even farmers who don't have access to computers and internet can easily register to IASF via SMS and sending to 51969. They can also pull agriculture information like crop calendar simply by sending an SMS to 51969 in a specified format. For eg. "IASF CAL MEG 1 4". This pull SMS will deliver the Meghalaya agriculture crop calendar for the month of January (denoted by 1) in Khasi language (denoted by 4).

Farmer can also send a Direct Query (Mobile Crop Doctor) to an expert by sending an SMS in this format to 51969. All the registered crop experts will simultaneously receive this SMS query from the farmer but only the first SMS answer from a registered expert will be processed by the system and automatically forwarded to the concerned farmer who sent the SMS direct query. This is designed in order to avoid varying solutions from multiple experts, which may confuse the farmer.

## **DEVELOPMENT OF IASF**

Developed entirely on open source software (PostgreSQL RDBMS and JSP), IASF project took two years to develop by a team of dedicated engineers at CDAC, Mumbai. Subsequently, IASF was also translated to *Khasi* language by a virtual team of agriculture experts from the department of agriculture, Meghalaya. Finally, in mid 2012, the *Khasi* version was ready to launch starting with 8 crops Viz., Rice, Potato, Mustard, Pea, Cabbage/Cauliflower, Tomato, Brinjal and Chilli). The IASF project contains 5 modules viz., Pest Management, Disease Management, Weed Management, Fertilizer Management and Seed Variety Management. This project was initially designed purely as web services framework without

any integration to mobile services. But it was during the early part of the year 2012 that DEITY, Ministry of Information Technology decided to implement a national Mobile Service Delivery Gateway (MSDG) and the project was given to CDAC, Mumbai to implement.

Taking advantage of the mobile gateway infrastructure being developed and utilising its core team, the project was able to successfully integrate PUSH SMS to be part of the service delivery channel of the project, in addition to web based interface and electronic mail. An SMS push facility was provided in the software and the department was able to provide valuable suggestions on how to optimise the service by enabling location based, language based and crop wise dispersal of agro advisories. In this manner, a targeted approach was also adopted rather than simply mass broadcasting of SMS to all registered farmers.

The project initially adopted a soft launch by piloting the project in East Khasi Hills district with the active collaboration of KVK, East Khasi Hills. About 150 farmers of East Khasi Hills district were registered in the IASF database by the project team. Awareness training was also conducted with only progressive farmers of the districts to determine their response. AIDA (Attention/Awareness, Interest, Desire, and Action) technique was used to design the communication strategy and was followed by a sample survey to get feedback from the targeted audience. A random sampling of 65 registered farmers was selected by KVK and the findings of the survey are given in table 1, 2 and 3.

**Table 1: Type of message required by farmers**

<b>Topics of Message</b>	<b>No of Farmers</b>
Package of Practices for Vegetables	26
Time of sowing/transplanting/planting	16
Livestock Management	15
Package of Practices of Field Crops	14
Nutrient Management	14
Pest Management	9
Information on Trainings/ Schemes	9
Seed Production Technique	9
New Technology in Agriculture	7
Flowers	6
Selection/ Availability of Seeds/ Planting Materials	3
Disease Management	2
Pesticide/ Fungicide Dosage	2
Fruits	1
Nursery Management	1

High Value Crops	1
Post-Harvest Management of Crops	1

**Table 2: Preferred time for receiving a message**

<b>Time</b>	<b>No of Farmers</b>
Morning	9
Afternoon	1
Evening	17
Anytime	38