

## **Agricultural Planning and Information Bank (APIB): Information Services for the Farmers**

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Indian farmers have to reckon with numerous variables in the agricultural system. Some of them namely, land and water resources, labour, seeds etc. are under his control whereas the price of produce, pesticides, fertilizers, power, weather and climatic change are beyond his means to manage them. Farmers are more concerned about the choice of crops/varieties that are appropriate for the changing weather and climatic conditions and more conscious about site-specific crop management so that the input costs are minimal and less risky. Farmer needs information and advice on these aspects. There are other players in the agricultural sector – such as financial institutions, traders, researchers, and extension workers. Each one of them directly or indirectly affects the efficiency of the system and needs a different set of information and advisory services. At present, the Indian agriculture extension system deals with 85 million land-holdings and about 500 million farmers, including farm women, young farmers and agricultural labourers. An extension system howsoever vast, cannot reach them fully on time, especially in the North Eastern Region (NER) where the terrain is rugged and inaccessible.

Using the remotely sensed data from Indian Remote Sensing Satellite (IRS) having capability of resolving what is grown in one tenth of an acre, it is possible to estimate the area under foodgrain, horticulture and commercial crops of neighbouring states and countries. A sort of agriculture intelligence and market information can be supplied to the farmers. Similarly, the remote sensing payloads from geostationary satellites like Kalpana-I, INSAT etc. can provide hourly information on weather systems. There is still scope to improve the methods of reaching the un-reached and to create more livelihood opportunities in the remote inaccessible terrain of this region despite the commendable efforts of the extension machinery of various departments. In the Indian context and especially in the NER, multiple extension agencies, training institutions, input and information suppliers are needed to compliment and supplement the current efforts. It is in this context that an example of using modern tools of remote sensing, Geographic Information System (GIS) and Information Communication Technology (ICT) in developing an enterprise called Agricultural Planning and Information Bank (APIB) is relevant and discussed here.

### **Methodology of developing APIB**

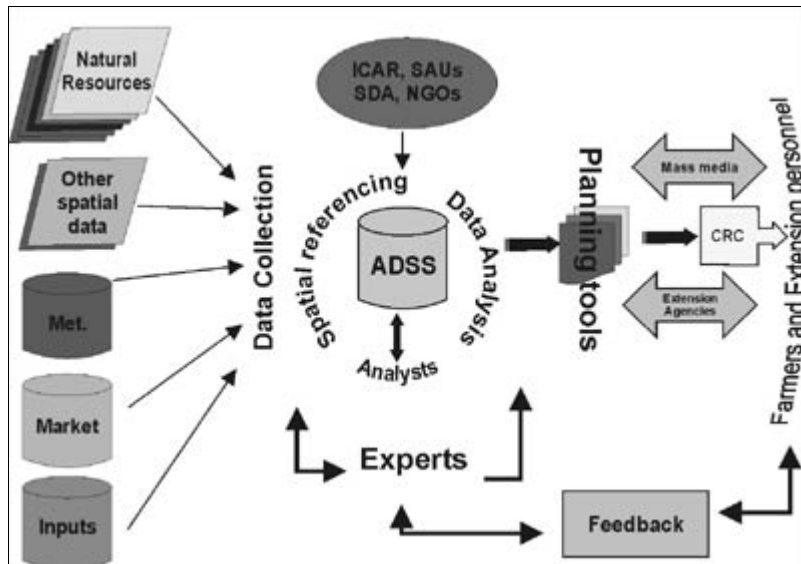
The first step in developing an APIB is to conduct a primary survey on the information needs of the farming community; identify the needs that are most important and essential; categorise them into highly dynamic and required to be supplied during various stages of crop growing season and the static one time needs.

The second step is to take stock of the natural resources potential of the district, block or a group of villages using remotely sensed data from IRS or other satellites and evaluate the resources availability, accessibility and usability for meeting the food, fodder, fuel wood and fiber needs of the human and bovine population of the area under study. Then, using the tools of GIS, the maps of natural resources (the supply components) and socio-economic parameters (demand components) are integrated to delineate coherent land units that can be allocated for appropriate land use, cropping systems and farming systems.

The third step is to collect non-spatial and attribute data through extensive organisational linkages established with the Universities of Agricultural Sciences, Institutions of Indian Council of Agricultural Research (ICAR), State Department of Agriculture and Horticulture, Directorate of Economics and Statistics, various non-government and private organisations in and around the

study area. These data sources are then pooled and synthesised into planning advises using GIS and relational database management tools.

The fourth step is to convince the people at the village level on the benefits of alternatives to the current land use and benefits of adopting improved practices and well informed decision making. Then reach them through the most accessible channels of communication. The flow of events in the methodology is shown in figure 1.



**Fig 1. Schematic of functional linkages in developing APIB**

### **Planning advisory services offered by APIB and their dissemination**

**Spatial information** includes the maps showing the distribution of natural resources endowments of any administrative unit (district, taluk, block or a mandal), present land use/land cover, areas that have residual soil moisture for taking up second or third crop, surface and ground water potential and areas suitable for appropriate land use practices that are useful for district/state level planners, rural financial institutions and extension agencies. Additional information under this category includes crop acreage/ production estimation and crop condition assessment in the domestic and foreign countries, useful for the farmers in deciding which crop would be more in demand in the market and profitable as obtained using satellite remote sensing, spatial variation in crop yields and input usage as derived from vegetation indices, GIS-based administrative units (viz., **khatha** numbers, villages, **mandals**, blocks and **taluks**/districts) that are having unfavorable spatial variability.

**Non-spatial information:** Information in different agricultural inputs, their manufacturers, major companies supplying them and government departments /agencies that are providing subsidy or credit for those inputs plus information on pests/diseases control, quantity of seeds required, crop duration, package of practices for each of the crop type in addition to literature on farm machinery, hand tools, harvest and post harvest equipment, information regarding the credit, subsidy, insurance schemes being operated by various financial institutions/other government agencies that are more relevant at the grass root level farmers and extension personnel.

**Agriculture market intelligence and infrastructure:** Information on market infrastructure facilities, export policies applicable for selected farm products, the price information for selected commodities, the dynamics of price fluctuations and forecasting through simple statistical analysis, facilities for storage, processing and value addition especially their locations, charges to be paid and formalities to be fulfilled, etc.

**Weather and climatic information:** Weekly and monthly probabilities of rainfall, long term climate change and trends in rainfall patterns, best practices under delayed and weak monsoon conditions etc that are very valuable to the farmers for carrying out farm operations. An important feature of this database is that the terminology used is not in English calendar months such a January-February, but in lunar calendar with terms such as **Purvashada, Utharashada, Shravana, Dhanishta** – that are familiar to Indian farmers particularly when scheduling farm operations vis-à-vis the rains. In addition, satellite-based rainfall monitoring techniques, supporting the advisory services could be built into the bank.

**Dissemination of Information services :** The planning advises and information services generated by APIB can be reached, on experimental basis, to the farmers and other decision-makers in the agriculture and allied sectors by post as well as through the extension machinery of State Departments of Agriculture and Horticulture, through the Community Information Centres (CIC) at the block level and district headquarters, the print media, especially the journals and magazines on farming and related fields. New methods of satellite-based instructional television, radio and communication can also be used for dissemination of APIB services.

The INSAT-based radio networking, Training and Development Communication Channel (TDCC) provides one-way video and two-way audio teleconferencing networks for interactive training and education. Such facilities are already established in many states and many more are going to be available under EDUSAT-1 (Education satellite) pilot projects aimed at interactive training, distance education and information dissemination.

All the information and planning tools from APIB can be run as an enterprise starting with an investment of about USD 1,111. APIB can be built around a Pentium III based personal computer. Information and planning advice can be sold as a commodity. A quick estimate of employment opportunities shows that nearly 500,000 graduates per year can get livelihood on running as many APIB like information kiosks as required in the rural India. The Subscribers Trunk Dialing (STD)/PCOs could be one of those locations for such kiosks in addition to village panchayat office buildings, cooperative milk societies and libraries in the villages.

On the lines described above, an APIB for the East Khasi Hills District of Meghalaya has been developed by the North Eastern Space Applications Centre (NESAC) in collaboration with the Meghalaya State user departments and the information services are presently made available on the Internet at the web site [http:// megapib.nic.in](http://megapib.nic.in)

## **Conclusion**

Indian farming community is passing through a phase of reducing incomes, uncertain and unpredictable markets and weather conditions. They need advance information and intelligence on agricultural commodities and their supply/demand position in the local as well as global markets. They also need advise on the impending climate/weather so as to regulate their choice of crops and farm management and operations. They have to be enabled to face the global competition. Combining the satellite technology with the tools of ICT, it will make possible to develop knowledge kiosks at the village level that can sell information and advisory services as commodities.

## **References**

- <http:// megapib.nic.in>