

In the changing global situation the focus in the following issues is needed immediately.

Protection of Environment :

Northern parts of West Bengal as a whole, is ecologically a fragile region. Its natural resources—soils, water regimes, forests, wild-life, bio-diversity, etc.—have been severely affected, by rising demands on account of rapidly increasing human and animal populations. Many wild-life and plant species have become extinct or are endangered. Agriculture on steep slopes has adversely depleted soil resources. Unscientific open grazing by large number of animals has depleted forest flora and pastures and endangered many shrub and grass species. Water springs have shrunk or even vanished altogether.

This region is a difficult area in terms of geography, accessibility and sustainable growth needs. The importance of hill area also lies in the fact that not only it is important for protecting and sustaining its own fragile environment for the long-term advantage of the region but also much more important for the health of the plains down-stream. After all it has to be remembered that the water and soil resources for the plains come largely from the hills.

The typical problems of northern West Bengal include skewed land use, inadequate and eroding forest cover, marginal agriculture, low productivity, heavy human as well as animal population pressures, incidence of poverty and deficiencies in physical as well as social infrastructural facilities. It is, therefore, important to consider all these points while formulating an agricultural policy and a land use plan for northern West Bengal.

Need for Objective and Reliable Database :

In planning for this region, one of the major constraints is lack of accurate and time series-based data relating to land, water, forestry, social and physical infrastructural facilities, employment, incomes, etc. which is mostly inaccurate and not available in time series forms so as to interpret the trends and understand the problems and work out solutions. It is, therefore, important to bridge the gaps. The data should be accurate, updated and available in time series forms so that changes can be monitored and evaluated for corrective mechanisms.

Land use Plan :

Land use is skewed and needs to be altered to a more optimal potential development. Serious data gaps exist in land uses and in changes that have been occurring. Reliable time series data is hardly available. These gaps need to be filled by developing data banks which should be networked for its' easy accessibility. Data would have to be regularly updated. Total available land in this area should be mapped out accounting for macro and micro level geo-climatic and biotic situations to determine optimal land capability choices. On that basis land use must move in a phased manner to capability profiles through policy and action. This will need full community participation. Land capability profiles need to be generated watershed-wise. For developing reliable land-use data there is a need of integrating different technologies like remote sensing, GIS and GPS with aerial photography and field-based surveys. In the management of village forests and other common property, land resources etc. the already available rights and concessions of the people should be respected as far as possible and their traditional knowledge and experience be utilized and built upon.

Water Resource Management :

Water flow and ground recharge data gaps are severe and need to be removed. Discharge measurements of small rivers, streams, rivulets and springs are essential for planning water resource uses for energy, irrigation, drinking and other purposes at macro, meso and micro levels. Watershed, to the extent possible should be the units of areal planning but watershed planning would have to be fitted with and nested in an ascending order. Water harvesting is very important and this can be done both by *in-situ* retention of moisture in soils and small storage. Even roof run-off can be easily stored and utilized. Powerless pumps (hydrams), sprinkler and drip irrigation need to be adopted for economizing on the use of water. Spring water resources need to be preserved. This will require the establishment of spring water sanctuaries. All possible moisture conserving agronomic techniques and crop rotations should be utilized to minimize water intensity of crop production. Water conveyance, wherever possible, should be channelized through closed conduits, pucca channels and grassland waterways to minimize seepage and evaporation losses. Water should be properly priced so that its waste is discouraged. Water users need to be trained in the management of local level water projects, water conservation and maintaining of good water quality. Their full participation in local level water management and use is very essential.

Agriculture :

The demand of land for non-agricultural uses like urbanization, infrastructure, industrialization, tourism, etc. is bound to increase over time. In view of the scarcity of good agricultural land in the mountain regions all possible care must be exercised to minimize diversion of such land for other purposes. Food self-sufficiency cannot and should not be the objective of agricultural development; nor should agricultural area be expanded. In order to meet foodgrain requirements the Public Distribution System must be strengthened in the region. High value low volume production approach should be adopted for agricultural, horticultural and similar other crops. Also, niche development of specified types of produce such as off-season vegetables, flowers, fruits, nuts, bulbs, seeds, spices and herbs should be encouraged for improving land productivity and income. This strategy will require many other steps towards improving post-harvest technologies, processing, packaging, branding, storage, marketing and distribution. Only then can the farmers'/growers' returns be reasonable and economic. The lab-land interface has to be made dynamic and interactive. Research is inadequate and needs a farmer-friendly approach. Research results must be proven in farm conditions before extension is attempted.

Horticulture :

- Subsidies may be provided to private entrepreneurs for establishing quality fruit nursery to supply genuine planting materials.
- Supply of quality farm input including fertilizers and pesticides and organic inputs need to be made available at first hand. Vermi-compost units with quality assurance need to be ensured.
- Specific encouragement may be given to cultivate varieties that have high export demand. New varieties may be introduced by accessing market demand.
- Rejuvenation of old orchard may be taken up to boost up productivity.
- High density planting must be followed using suitable dwarf cultivar to boost up the productivity.
- Strategies are to be developed through scientific research for correcting micronutrient deficiency.
- Video call center at block level may be developed wherein farmers can contact a panel of experts to fix their problem with live specimen.

- Intensive training and awareness program must be taken up to educate framers regarding specific quality requirement of different market and the agro-techniques that must be followed to attain that quality.
- Attempt should be made to introduce new crops and to encourage crop diversification.
- Market intelligence should be developed to enable growers to access the market demand of particular crop.
- Private entrepreneurs may be encouraged to establish multipurpose cold storage, precooling facilities, scientific pack house, CA/ Refrigerated transport facilities.
- Specific research activities must be encouraged to formulate new products from different fruits and vegetables available in the region and generate locally available technologies.
- Encouraging establishment of processing industries

Forest :

Management of forests must be based on the principles of protection, regeneration and additions to forest area. Community forests should be squarely placed in the hands of users and for this purpose local empowered institutions would have to assume responsibilities. Full technical support must be provided to local communities for managing their forests. Forests must be accepted primarily as a source of soil, water and air. The next priority should be given to local needs of people and only then, we can think of commercial uses.

Livestock Production Management :

Livestock managemental issues, specifically related to feeding, housing, behaviour, adaptation etc. are of utmost importance for improvement of the health, productivity and welfare of animals. Therefore, development of managemental norms with respect to feeding, breeding, housing and health care need to be undertaken in cattle, buffaloes, sheep, goats, pigs and other livestock species for enhancing growth, reproduction and production performance. Understanding animal behaviour and development of appropriate modules are also required to enhance production and to promote animal welfare. In modern intensive method of animal production, modernization of livestock production units through electronic identification, automation of various livestock farm activities including livestock shelters and fodder production will have to be undertaken for efficient utilization of available resources.

Extension Education :

It is increasingly realised that the technologies generated at the research institutions are not readily adaptable in field conditions, especially in livestock sector. The envisaged programme will foster close linkages between research systems and clientele. Technology feed banks (ATICs and KVKs) will ensure that technologies developed find immediate users. Regular feedback would help in technology refinement so that a continuous process is established for improved performance under field conditions. Flow of information between technology feed bank and utilization points would provide strong basis for development of only need based technologies. It is also envisaged to develop cyber extension network modules in the form of species specific interactive crop and livestock information modules in local languages to be disseminated through local information kiosks. Another core domain which will have top priority is IPR and technology management, facilitation of transfer to the industries and end users and entrepreneurship development.

Human Resource Development :

The University will continue to perform the important role in the development of trained manpower in various fields of agricultural, horticultural and agricultural engineering sciences. New courses and advanced training programmes will be launched in order to develop the required manpower to meet the fast expanding private industry and also for promotion of entrepreneurship. For the aforementioned purpose, the infrastructures like development of Regional research station and sub-station, well equipped modern laboratory, establishment of colleges, digital library, centre of advanced studies on different areas would be the prime focus of the University.