

Extension Approach to sustainable Agriculture Development in NEH Region

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The traditional agriculture in North Eastern Hill (NEH) region has relied primarily on locally available natural resources and their management for meeting the needs of food, fodder, fiber and fuel. The history of hill agriculture clearly indicates the prosperity and effective management practices like maintenance of soil fertility, control of soil erosion, management of water resources and management of forest resources by indigenous means and methods. Upto a certain stage even the *jhum* or slash and burn method of cultivation have been proved to be very effective in maintaining the soil health and land extensive agriculture. But the situation has been drastically changed owing to the rapid growth in population, penetration of market forces, increase in support services and basic infrastructure and the indiscriminate use of natural resources. This has mainly occurred due to poor level of education, lack of systematic policy for land reform and sporadic research activities ignoring the microfarming situation of this region.

The overall assesment of agriculture in the North Eastern Hill Region projects a grain picture when the total requirement of foodgrains and present production level is compared. As per the estimate of National Commission of Agriculture, this region will have to produce 2716.1 thousand tonnes of foodgrain by the year 2020 from the present level of 1571.8 thousand tonnes (1991) to feed the projected population of 10 million. With the population explosion and increasing demand for quality land for urbanisation, agriculture will be pushed more and more to marginal lands and fragile environment. At the same time effective means must be searched for not only to produce the required amount of foodgrains but also to sustain the productivity to the maximum possible extent to provide the food security and check the malnutrition and high infant mortality rate of this region. This obviously calls for sustainable hill agriculture to cope up with this acute situation.

Components of sustainable agriculture are the ability of bounce back after shocks; environmental harmony and economic growth at steady rates. Thus, sustainable agriculture is defined as a process of learning and adaptation for mountain natural resource management.

To achieve this desired sustainability in hill agriculture in NEH region, reseearch, extension and education must be interrelated in such a way that they can cover all the components of development.

Education : The priority given to agricultural education has not been uniform. In most of the states of NEH region peasant families are still predominantly illiterate. Facilities for voca-

tional education are also yet to be created as per the requirement. Despite the fact that this region is mainly dependent on agriculture, agricultural education has not received the priority it deserves. The agricultural education has been dependent on agricultural colleges at Manipur and Nagaland.

Research : Research programmes of the agricultural and research institutions lack agro-ecological zone perspective. More emphasis has been given on discipline oriented research. Balance must be maintained between these two with increased research on natural resource management and a new spirit of partnership has to be adopted particularly to achieve sustainable improvement in mountain ecosystem. Different agro-ecological zones should be clearly delineated to facilitate the identification of potential production zones based on agro-climatic and soil characteristics. This will lead to exploitation of the high productive areas without disturbing the natural ecology of this region.

Linkage and coordination : There is a noticeable lack of effective linkages among the different organs of research system and the farmer. There is a visible absence of both the mechanisms and mandates for a participatory approach. This makes the farmers passive partners, receiving ideas and technologies imposed from outside. This is the arena where extension must involve itself to encourage more and more farmers involvement in research, education and policy decision making. The 'China type' extension model may be appropriate for the agriculture of NEH region also where extension will have the full power to dictate the researchers to take problem solving measures after careful identification and prioritization of research needs of the peasants. Another important sector to be covered by extension is the effective linkage among the different organs of the research systems and the farmers. The absence of this mechanism may be compensated by more and more participatory approaches where the research will start and end with the farmers only.

Indigenous technological knowledge : The traditional art and science of resource management and production were evolved and inherited by tribal communities through centuries of informal experimentation. The modern day agriculture has neglected those traditional wisdom. These traditional technologies like soil conservation measures, watershed management etc. must be restored before they become extinct. Similarly, the indigenous farming systems abundantly found in almost all parts of this region must be studied to find out different core components to make it viable by suitable modification.

Land tenure system and reform : Land tenure and land reform system, the most neglected aspect of hill agriculture must be addressed at the earliest to pave the way for hill agriculture. Land ownership and land tenure system prevailing in the NEH region is probably the greatest bottleneck in agriculture development. The prevailing system has led to lack of interest in improvement of the lands. There are three broad categories of land ownership commonly found in this region.

- Land owned by villages collectively,
- Land owned by the village chief, and
- Land owned by individual families.

Unless and until the farmers cannot own the lands under single ownership, no development activities can be forced on them.

Human resource development : Special training is needed to upgrade old skills as well as to learn new ones. Awareness regarding various dimensions of agriculture - such as productivity, profitability, crop choices, inputs, marketability, environmental effects, etc. should be generated so that households are aware of those problems and opportunities of different activities. Training and awareness alone do not go very far if support services and material inputs are unavailable to the households to apply their training and awareness. Consequently, an important component of human resource development should be ensured so that support services and material inputs are available and readily accessible.

The challenge before policy makers, scientific bodies and development agencies to make agriculture sustainable in fragile resource zone like NEH has never been greater. While maintaining indigenous method of agriculture is highly improbable from the food security point of view, modern technology cannot be permitted to destroy the biophysical basis on which life of this entire region is sustained. A major task before the research and education system particularly for the entire extension system is to determine the nature and type of technologies which will be cost-effective, local resource based and exclusively by the farmers, for the farmers and of the farmers.