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### Organic Farming of Medicinal Plant in Uttarakhand: An Overview

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India is bestowed with diverse climatic conditions that are suitable for cultivation, especially those of medicinal plants and considered as “Herbarium of the World”. About 2000 indigenous plant species have curative properties and 1300 species are known for their aroma and flavours. India has 15,000 medicinal plants that include 7,000 plants used in *Ayurveda*, 700 in *Unani* medicine, 620 in *Siddha* medicines, 450 in Homeopathy and 30 in modern medicines and over 10,000 herbal drug formulations have been recorded in codified medical texts of *Ayurveda* (Sharma, 2018).

Despite the success of ‘Green Revolution’, the battle to ensure food and nutritional security for hundreds of millions of miserably poor people is far from won. Mushrooming populations, changing demographics and inadequate poverty intervention programmes have eroded many of gains of green revolution in India. We are losing nearly Rs. 25,000 crores with agricultural produce due to insect-pest

and diseases. According to WHO estimate, approximately one million people are taken ill every year with pesticides poisoning and up to 20,000 of those die in agony. Although the third uses one sixth of total pesticides produced globally. At least 37,500 people are poisoned yearly, 1500 of them fatally (Mukhopadhyay, 2004). It is worthy to note that fertilizer consumption increased from 14 mt to 30 mt and pesticide use increased from 50-60%. Most of the fertilizers contain heavy metal and some of common pesticides are highly toxic and polluting soil, environment and food chain (Kalloo, 2004). It has also been made at the cost of ecology and, therefore, the sustainability of agriculture and food security in the long run is now being questioned. So the Uttarakhand state has to promote alternative agricultural approach called organic farming, which essentially does not threaten the sustainability of mountain agriculture and fragile mountain environment.

Uttarakhand has a rich tradition in organic farming and medicinal plants. Due to its subtropical to cold arid climate, it is having considerable diversity for a number of medicinal plants and known to be a rich repository of medicinal plants (Choudhary and Sharma, 2005). Majority of the medicinal plants, required by the herbal drug industry are collected mainly from the wild growth. Rapid population growth and rising popularity of herbal drugs have brought into focus the acute scarcity in availability of some of the plants due to indiscriminate and unregulated collection, habitat's destruction through expanding agricultural lands, deforestation and urbanization. Fall in the supply of good quality, genuine raw material has resulted in price rise and deterioration in the quality of formulations. During the recent years, their demand for the internal use and for export as well has increased considerably, necessitating the production of these crops on large scale. It has become important to introduce these crops into cultivation to meet the demand of herbal drug industry and to maintain the standard on quality, potency and efficacy (Tewari, 2004). In order to boost organic farming in Uttarakhand and develop it as a fully organic state, the centre has sanctioned Rs. 1500 crore to develop 10,000 organic clusters in the state for the next three years (Hindustan Times, 2019)

### **CONCEPT OF ORGANIC FARMING**

As per USDA 1980 report, 'Organic Farming' can be defined as "Production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators and livestock feed additives". To the maximum extents feasible, organic farming system relies upon crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, minerals bearing rocks and aspects of biological pest control to maintain soil productivity to supply plant nutrients and to control insects, diseases and weeds (Srivastava and Kalloo, 2004).

### **PROSPECTS OF ORGANIC FARMING**

- The production is of high quality and in sufficient quantity.
- Sustainability of soil health.
- Effective land use through utilizing interspaces of crops for cover cropping and green manuring cropping, etc.
- The enhancement of biological cycles in farming system.
- Utilizing, as far as possible, renewable resources.
- Reduced environment hazards and improved public health.
- Increased farm income through export earning and tapping the elite domestic market.
- Rural employment generation.

Medicinal plants are used for preparation of drugs. Any contamination (particularly chemicals) may lead to various kinds of health hazards. Hence, organic production offers a better possibility in horticulture rather than in the field crops (Pathak and Ram, 2004). Considering the ill effects of conventional farming, Government of India was forced to consider seriously regarding future of Indian Agriculture and a task force was constituted to suggest alternative of Modern Agriculture under chairmanship of Dr. Kunwarji Bhai Jadav of Rajkot and Commissioner Agriculture GOI as member secretary. The Task Force made following observations:

- The organic farming is being practiced by a number of farmers and institutions in the country though mostly in unorganized way.
- Success stories indicate the benefits of organic farming.
- There is no awareness among people, in general, about the benefits of organic farming, as there is no state or central Government support.

- Markets have not been developed in the country for the sale/promotion of organic produce.
- The system of export of organic produce presently is at limited level and exact data are not available.
- Huge subsidy is given per ton production of chemical fertilizers; but no subsidy or incentive is provided for use of organic manures.
- The Ministry of Commerce, Government of India has set up standards for organic farming and defined the system of Certification and Accreditation only in April, 2000 which may facilitates further growth of organic farming in the country.

### **STRATEGIES FOR ORGANIC PRODUCTION OF MEDICINAL PLANTS**

The medicinal crop plants are non-conventional in nature. The cultivators are still not fully aware of their potential. The cultivation, processing and production technology are not available at grass root level. Availability of genuine, high value planting material and facilities for quality evaluation are lacking. The active principles of the plant are generally secondary metabolites and their biosynthesis, though controlled genetically, is strongly affected by environmental and cultural factors. It is, therefore, advised not to be using chemical fertilizers, insecticides and pesticides in cultivation of medicinal plants. While planning for cultivation of medicinal plants, the factors like geographical and edapho-climatic conditions like availability of sunlight (quantity and duration), shade, etc. are also to be considered. During recent years, several recommendations have emerged for undertaking cultivation of medicinal plants on marginal/problematic soils like saline, alkaline or wastelands. The cultivation on these soils requires special

agronomic management and amelioration before starting the cultivation. The plants have varying degree of tolerance to such soils and the cropping system need be adopted accordingly. The agronomic management factors like water, fertilizer and weed and pest management require specific attention for cultivating of medicinal plants. The use of chemical fertilizers should strictly be avoided as this may reduce the value of the herbs. Use of synthetic chemicals for the control of pests and diseases should be avoided due to their great hazards to humans, lower forms of animal life and also to the active principles of the medicinal herb. Harvesting of herb requires careful planning so as to retain their active ingredients (Tewari, 2004).

### **MAJOR LIMITATIONS IN PRODUCTION OF MEDICINAL PLANTS**

The commercial cultivation of medicinal plants is often found uneconomical mainly because of poor marketing infrastructure. The price of the produce is totally controlled by the retail market and is quality based. In absence of testing and standardization facilities, there is wide fluctuation in the prices. Small farmers on marginal lands are generally cultivating medicinal plants with low input in resources. Besides these, information on several aspects of their agricultural productivity is also not easily available to the farmers, which makes their venture a failure. The produce from the medicinal crops requires a long gestation period, thereby making the venture unsuccessful. The recommendations regarding agro-technology for medicinal plants are available only in piece meals, for individual crops, totally neglecting the important aspects of growing medicinal plants as inter or mixed-crop with other medicinal plants or traditional agricultural crops are also not available. Such incomplete recommendations targeting to increase the production of individual plants have limited use only as they are difficult and uneconomical to be followed by the farmers. It is,

thus, necessary to carryout research with an objective to develop the most efficient cropping system, involving medicinal plants, agricultural crops, cash crops and trees for different agro-climatic regions.

### PROBLEMS OF ORGANIC FARMING

- Package of organic farming technology has to be location specific.
- Bulky nature of organic manure leading to higher transport and application cost.
- Small farm holding reduces the scope for *in situ* organic manure production.
- Lack of awareness among farmers about scientific producers of compost making and application.
- Lack of scientific data on the long-term benefits and limitations of organic farming.
- Limited domestic market for organically grown horticultural produce.
- Possible yield reduction in comparison with intensive cultivation.
- Poor extension services regarding transfer of technologies related to organic farming to the stake holders.

### POLICY INITIATIVES

The various policy initiatives of the Uttarakhand are as follows (Ramkrishnanappa, 2004).

### SETTING UP OF INSTITUTIONS TO SUPPORT ORGANIC MOVEMENT

- Formation of Uttaranchal Organic Commodities Board to support and facilitate the organic farming in the state.
- Uttaranchal State Seed Certification Agency has been reconstituted as Uttaranchal State Seed and Organic Production Certification Agency.

- Internal Control System has been formed to reduce the cost of certification for farmers by International Certification Agency.
- Two organic farming training centers have been developed with capacity of 40 participants per day per center.
- All the state owned agriculture farms are under conversion for organic production and are being developed as “Centre of Excellence” for different organic commodities and also as nodal Centre for promotion of organic production.
- All the research institutions in the state have to do research on the different aspects of organic farming.

### OTHER POLICY ACTION

- All the staff of agriculture and horticulture department will have to undergo training on organic farming.
- Agriculture department of the state will not promote chemical practices in the hill regions of the state.
- G.B. Pant University of Agriculture and Technology, Pantnagar is geared to provide package of practices on organic farming.
- A separate room/shop for organic farmers in the state *mandies* is provided.
- National and Regional Seminar will be organized every year to expand knowledge base and to gain policy support from the centre.

### MAJOR ACTIONS TO BE INITIATED

- To convert conventional farms into organic farms with time bound programmes.
- To enhance the income of the farmers by reducing the cost of production, reorganizing the market chain and attaining sustainability.

- To introduce participatory approaches in promotion of organic farming by involving all stakeholders at all decision-making levels facilitated, by and large, by the Government.
- To integrate all land based activities like agriculture, horticulture, animal husbandry, sericulture, apiculture, aquaculture, forestry and other land use activities in policy making and at implementation levels.
- To promote production of organic inputs on individual/commercial scale locally involving SHGs/NGOs/Farmers Associations/Farmers/Companies.

### **SPECIFIC ACTIVITIES NEEDED**

- Production of green manure seeds in sufficient quantities to be used by every holding.
- Promotion of multipurpose tree species on farm.
- To create infrastructure to facilitate grading, processing, packing and marketing of organic produce locally with transparent pricing and benefit distribution.
- To document existing sustainable organic farming practices and to develop package of practices by Research Organization/ Government Department/ NGOs.
- To popularize use of organic produce among consumers, large-scale production by small producers of truthful organic produce certified by local agencies/ NGOs /farmer associations need to be encouraged.
- To create infrastructure for testing organic inputs and outputs (products) with effective and economic methods, test centers and sampling.
- To support private sector participation in marketing of organic produce.

- To support organic food processing industries and encourage stable seller buyer relationships.
- To introduce organic farming curricula in school, colleges and universities.
- To create new market opportunities for export through development of value added organic products.

### **CONCLUSION**

Uttarakhand with its varied agro-climatic conditions is ideal habitat for a large number of medicinal and aromatic plants. As a result of unscientific exploitation of plant wealth, particularly from the natural resources like the forest areas, the available bio-diversity is under threat and many of the plant species are on the verge of extinction. Large scale adoption of organic practices by farmers depends on their technological and socio-economic feasibility. The survival of organic sector depends not only on growing markets, but also governmental and inter-governmental support through research, education, training, extension and advisory systems. To facilitate this, national and local institutions engaged in agricultural research, education, extension and training well have to make structural and functional changes to integrate all land-based activities in conformity with the basic principles of organic agriculture. Efforts have been made by different organization like the Ministry of Forests, Department of Indian System of Medicine and Homeopathy, besides the Department of Agriculture and Cooperation, which need integration. The role of National Medicinal Plant Board becomes very important which could strive to bridge the gaps for enhancing the growth of the sector. Marketing and quality control are areas needing attention. Research efforts through the ICAR-SAU system have helped in evolving agro techniques and development of new varieties. However, commercial cultivation of these plants would require reduced cost of cultivation and proper market tie-up. The working groups on

Horticulture for the formulation of plan have projected a high growth in the MAP sector and have recommended for plan instruments not only for continuing the ongoing programmes but also on new activities like established of gene banks on farm handling, primary processing, plant health clinics, establishment of disease forecasting, leaf analysis, labs use of IT, etc. to be implemented in Mission Mode approach. Now, it is time to harness the potentially, to achieve visualized growth.

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