



Organic Farming based Farming System and its role towards Sustainability

M S Gill

Department of Agronomy
Punjab Agricultural University, Ludhiana-141004 (Punjab)

ABSTRACT

In India, 85 per cent total cropping systems are cereal-cereal e.g. rice-wheat (10.5 M ha.), rice - rice (6.0 M ha.), pearl millet - wheat (2.3 M ha), sorghum - wheat (2.3 M ha.), maize - wheat (1.9 M ha.) etc. These systems are very exhaustive in nature and removal of nutrients is much more than the replenishment and as result the productivity of different cropping systems is at plateau. In the Indo- Gangetic Plains which is considered as a food bowl of the country is also being affected on account of over exploitation of the natural resources. Since rice-wheat is the predominant cropping system and excessive wet tillage in rice cultivation has caused soil degradation problem and the physical, chemical and biological conditions of the soil are being affected which need to be rejuvenated. Therefore, it has become of utmost importance to conserve the natural resources by following organic farming based farming system approach. The water conservation is an integral component of this approach and a function of soil property largely determine the infiltration rate and soil depth partially control the amount of water stored in the soil. For higher water intake, soil surface has to be covered by mulching material or inter cropping so that surface sealing and crusting do not occur. Shallow tillage increases the soil surface roughness that helps in cutting runoff. Soil cover and addition of organic matter increases the soil moisture storage and ultimately soil health. There is an urgent need to do follow the natural farming or zero budget farming by making use of the resources available at the farm itself. The use of bio-fertilizers, bio-dynamics formulations, recycling of crop residue, crop rotation, application of green manuring, farm yard manure, extracts of herbs, following *bhumi sanskar*, *beej sanskar*, use of bio agents not only would reduce the cost of production but simultaneously make the ecosystem more vibrant by making a choice of the various plantation crops based farming system. Likewise vegetable, poultry, mushroom/ rabbitary/piggrey/fishery based farming systems to make the production system productive, profitable and sustainable over a longer period of time.

Key Words: Organic Farming, Farming System , Sustainability.

INTRODUCTION

Organic agriculture has grown out of the conscious efforts by inspired people to create the best possible relationship between the earth and the men. It is holistic production management system which promotes and enhances agro-ecosystem health, including bio-diversity, biological cycles and soil biological activities. It emphasizes, the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require

locally adopted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods as opposed by using synthetic materials, to fulfill any specific functions within the system.

It is worth to mention that for the last four decades, the cultivated area of the country is 142-143 M ha. and simultaneously population pressure is building up. There is general notion among the people that to ensure the food security of the

*Corresponding Author's Email: mukhtarsingh@icmr.gov.in

Gill

country, intensive efforts are required to increase per unit productivity, which is not possible without the use of chemical fertilizers. However, organic farming has a scope as a component of farming system, which is an appropriate combination of farm enterprises such as crops, livestock, fishery, forestry, poultry, sericulture, mushroom etc. and the means available to the farmers to raise them for profitability. It interacts adequately with the environment without dislocating the ecological and socio-economic balance on one hand and attempt to meet the national goals on the other (Gill, 2009). Both the concepts are inter related. In farming system too, efforts are made to use the by-product of one enterprise as an in-put for the other enterprise and least dependence on the external inputs.

Scope and Need of Organic Farming

- Globally one million pesticide poisoning cases and 20,000 deaths every year are being noticed only due to high pesticide residues in food chain-WHO.
- Degradation of bio-diversity due to heavy use of chemical in agriculture.
- To increase the export potential of agricultural produce.
- 25 per cent of Indian food products contain pesticides residues above tolerance levels compared to only 1-2 per cent globally.
- Almost 97 per cent of Indian food products contain detectable pesticide residues compared to 20 per cent at global level.
- Rejection of Indian agricultural exports is more than Rs 4,000 Crore annually because of very high pesticides residue content.
- Growers of rainfed hill agriculture and small and marginal holdings in irrigated eco- system regions are producing crops organically and getting premium prices from the local consumers.

Why Farming Systems?

- The sustaining household food security has been an issue of prime importance for majority of the farmers belonging to the category of small and marginal holdings.
- New improved technologies, even when

considered technically sound find limited acceptance by majority of resource poor farmers because such technologies are mainly targeted to the resource endowed production system.

- Each individual farm has its own specific characteristics arising from variation in resource availability and family circumstances. Likewise, the bio-physical, socio-economic and human characteristics of a farm are independent in time and space.
- To solve the problem of farmers, who operate in a complex, diverse, risk prone environment; a need is being felt to develop holistic client oriented and inter-disciplinary farming system approach.
- To fulfill the basic needs of farm households to ensure the rational use of resources and evade malnutrition and poverty.
- Multi- functionality of agriculture was observed in terms of social, cultural and food security whereby the public is benefitted through employment opportunities and accessibility to better food.

Benefits of Organic Farming

Organic agriculture sustains the health of soils, ecosystems and people. It relies on ecological processes, bio-diversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality for all involved. According to Gill and Prasad (2009), organic farming aims at the following

- Minimizing cost of production
- Healthy food
- Augmentation of profit
- Improving soil health
- Counteract the climate change
- Minimize energy consumption
- Encourage natural habitats

Benefits of Farming System

While farming system aims at increased productivity, profitability, sustainability, balanced

Organic Farming

food, clean environment, recycling of resources, income around the year, adoption of new technology, solving energy fuel and fodder crisis, avoiding deforestation, increased employment generation, input-output efficiency, enhanced opportunity for agriculture oriented industries and standard of living of the farmers (Gill *et al* 2009). thereby organic farming based farming system can well address the challenges such as decline in water table, appearance of multi-nutrient deficiency, less response to applied nutrients, excessive use of pesticides, soil degradation and climate change.

Principles of Organic Farming:

It has four principles as under

The Principle of Health: Organic agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.

The Principle of Ecology: Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.

The Principle of Fairness: Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.

The Principle of Care: Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment.

Misconceptions about Organic Farming

- Can we sustain the food security to ever-increasing population through organic farming?
- Is it possible to meet the nutrient requirements of the crops entirely through organic sources?
- Are there any significant benefits of organic farming in terms of food quality?
- Is organic farming economically viable?
- Is it possible to manage weeds, insect-pests and diseases in organic farming to sustain yield levels?
- Complex and costly procedure of identification.

- The risk involved in marketing of organic produce at premium rates are not available in domestic markets.

Lack of Active Interest among Farming Community

There is considerable latent interest among farmers in conversion to organic farming because of the following reasons:

- Perceived high costs of doing so, which is mainly due to incomplete knowledge about principles and practices of organic agriculture among farmers. Farmers often seek for off-farm inputs, leading to escalation in production costs, which is against the basic philosophy of organic agriculture. Moreover, very high government subsidies on chemical fertilizers in conventional agriculture are not taken into account while comparing the economic costs.
- Non availability of adequate quantities of organic manures and other organic inputs in the local market from reliable sources. Farmers are, more often than not, forced to recycle major quantities of crop residues as animal fodder and animal dung as source of household energy. Sizable quantities of crop residues are also sold off to paper and cardboard industry to earn cash for household needs.
- Complete knowledge about organic farming principles, practices and advantages accrued to grower as well as mankind, is not filtered down to the small farmers, which should be actual target and potential beneficiary of organic farming. Further, whatsoever information reaches to target groups, is very often not backed by scientifically proven results in tropical/ sub-tropical climatic conditions and different farming situations prevailing in Indian sub-continent (Gill and Prasad, 2009).

Example

The results of a case study at the farm of Sh. Krishan kumar Jakhar in Village-Dhaba, Tehsil Sangaria, Distt.-Hanumangarh (Rajasthan) who used to grow crops (cereals, pulses, oilseeds), vegetables, fruits with organic source of nutrition, jeeva amrit, crop residue management, livestock,

Gill

beej sanskar, bhumi sanskar, panchgaviya, decoction of herbs as pesticides, decant of biogas slurry and other ITK at his farm clearly revealed the following facts (Gill, 2009).

- The quality of the produce is considered useful to keep good human health.
- Agriculture is economically and spiritually beneficial to the consumers.
- Agriculture is highly sustainable at his farm.
- The agriculture practiced at his farm is conforming to nature.
- Levels of productivity were highly satisfactory.

It has led to diversified farming where the farmer is engaged in a multitude of farm enterprises. If a large number of crop enterprises, with or without a number of non-crop enterprise is run by a single farmer. It leads to better resource utilization and production utilization with ultimate aim to fulfill the farm household need, create employment opportunity, ensure regular flow of income and improve the standard of living by ensuring livelihood security.

Strategies Needed to Promote Organic Farming Based Farming System in India

In Indian context, to promote and make organic farming based farming system economically viable following issues are needed to be addressed.

- * Adequate research and extension support needs to be provided in order to improve region specific farming techniques and disseminate findings for conversion and management of organic farms in farming system mode.
- * Researchers should study and quantify the role of organic agriculture in mitigating the climate change and ill effects of modern agriculture and improve resource sustainability.
- * Central and State government should acknowledge organic farming as an emission mechanism to reduce green house gases and sequester carbon. They should help farmers by promoting organic agriculture through research and extension services.
- * Government should recognize organic agriculture in Kyoto Protocol carbon credit mechanism.

- * Organic market development sector needs major thrust on developing supply chains and related infrastructure to ensure competitive price of organic produce to the grower in domestic and international markets.
- * Mission – Mode programs for on-farm demonstrations, training for capacity building of institutions, organic farmers, service providers, NGOs and processing / packing industry, with full research backup are needed. Model organic farms are need to be established in Public-Private-Partnership mode.
- * Government support is required for cheaper access to organic certification of farms.
- * There is a need to create the data base on farming system in relation to type of farming system, infrastructure, economics, sustainability etc. under different farming situation.
- * Need to develop research modules of farming system under different holding size with varying economically viable and socially acceptable systems.
- * The assessment and refinement of the technologies developed at research station at cultivators' field.
- * Need to prepare a policy a contingent planning to counteract the weather vagaries/ climate threats under different farming situations.
- * Need to prepare a policy draft for the consideration of planners for its promotion at large scale with nominal financial assistance either through short/medium /long term loans and other promotional advantage.

REFERENCES

- Gill M S (2009). Cooperative organic farming in Rajasthan – A case study. Compendium on Advances in Organic Farming, project Directorate for Farming System Research, ICAR, Modipuram : pp 8-9.
- Gill M S (2009). Integrated farming system – A noble approach for enhancing farm income. *Indian Farming*. **59** (6) : 12-17.
- Gill M S and Prashad Kamta (2009). Organic Agriculture – Concept, Status and strategies in Indian Perspective. Compendium on Advances in Organic farming, project Directorate for Farming System Research, ICAR, Modipuram : pp 1-7.
- Gill M S, Singh J P and Gangwar K S (2009). Integrated farming system and agriculture sustainability. *Indian Journal of Agronomy*, **54** (2) : 128-139.

Received on 26/8/2014 Accepted on 15/9/2014