

Lecture no- 1

ORGANIC FARMING: AN INTRODUCTION

World population is increasing day by day. Hence it is necessary to stabilise agricultural production and also to increase it further in sustainable manner. It is realized that the 'Green Revolution' with high input use has reached a plateau and is now sustained with diminishing return of falling dividends. Thus, a natural balance needs to be maintained at all cost for existence of life and property. The obvious choice for that would be more relevant in the present era, when these agro-chemicals which are produced from fossil fuel and are not renewable and are diminishing in availability. It may also cost heavily on our foreign exchange in present and future. Organic farming as a sustainable production management system provides long-term benefits to people and the environment.

ORGANIC FARMING

Organic farming system in India is not new; it has been practiced for thousands of years. In the traditional organic-based food production system, the entire agriculture was practiced using organic techniques, where the pesticides, fertilizers, etc., were obtained from plant and animal products. For instance, cows were raised not only for milk, but also as bullocks for farming and excrement used as fertilizers.

The organic movement today is a restoration movement in the sense that it seeks to restore balance that was lost when technology grew rapidly in the 19th and 20th centuries. The organic movement began in the middle of 1920s in Central Europe through the hard effort put by Rudolf Steiner. He created bio-dynamic agriculture, which is an earliest version of organic farming. The system had its base on Steiner's philosophy, based on theology, rather than holding firm proof of science. *Organic farming was independently developed in the 1940s in England through the work of Albert Howard. He is widely considered in the English-speaking world to be the "father of organic farming".* His work was continued by J.I. Rodale in the United States, Lady Eve Balfour in the United Kingdom, and many others across the world.

Definition- 'Organic farming' is a unique production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity, and this is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs.

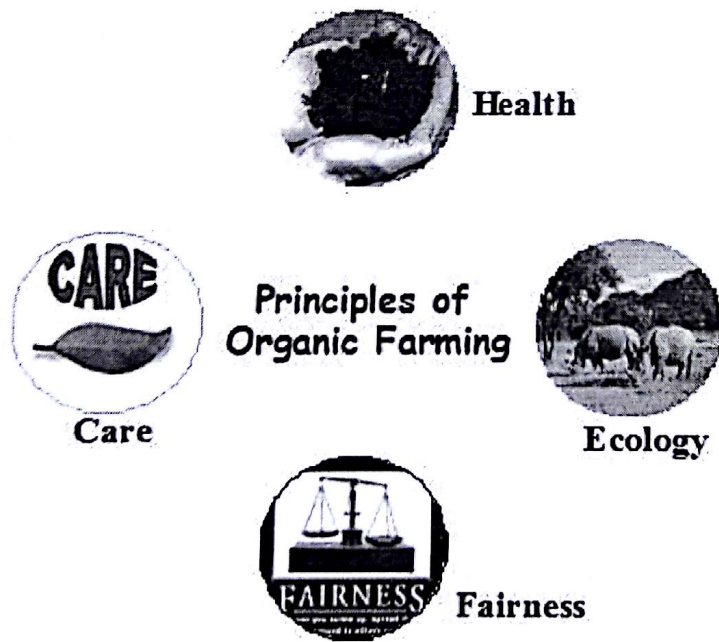
In other words, Organic farming is a system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection.

Q- Give Principles of Organic Farming

PRINCIPLES IN ORGANIC FARMING

FIGURE

Four Core Principles of Organic Farming



Principle of Health

Health is the vital for all living systems. It is not simply having control over illness, but developing physical, mental, social and ecological well-being. Immunity, resilience and regeneration are key characteristics of health.

Organic Farming sustains and enhances the health of soil, plant, animal, human and planet as one and indivisible. The health of individuals and communities

cannot be separated from the health of ecosystems - healthy soils produce healthy crops that foster the health of animals and people.

The functions of organic farming are to sustain and enhance the health of ecosystems and organisms. In particular, organic farming is meant to produce high quality, nutritious food that contributes to health care and prosperity. In view of this it avoids the use of fertilizers, pesticides, animal drugs and food additives that may have adverse health effects.

Principle of Ecology

Organic Farming is based on living ecological systems and cycles, work with them, emulate them and help sustain them. It is based on ecological processes, and recycling. Nourishment and well-being are achieved through the ecology of the specific production environment. For example, in the case of crops this is the living soil; for animals it is the farm ecosystem; for fish and marine organisms, the aquatic environment.

Organic farming fits the cycles and ecological balances in nature. These cycles are universal but their operation is site-specific. Organic management is adapted to local conditions, ecology, culture and scale. Inputs are reduced by reuse, recycling and efficient management of materials and energy in order to maintain and improve environmental quality and conserve resources.

Organic farming attains ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity. Those who produce, process, trade, or consume organic products should protect and benefit the common environment including landscapes, climate, habitats, biodiversity, air and water.

Principle of Fairness

Organic farming should build on relationships that ensure fairness with regard to the common environment and livelihood opportunities. Fairness is characterised by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings.

This principle emphasises that those involved in Organic Farming should conduct human relationships in a manner that ensures fairness at all levels and to all parties - farmers, workers, processors, distributors, traders and consumers. Organic

Farming provides everyone involved with a good quality of life, and contribute to food sovereignty and reduction of poverty. It aims to produce a sufficient supply of good quality food and other products.

Natural and environmental resources that are used for production and consumption should be managed in a way that is socially and ecologically just and should be held in trust for future generations. Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs.

Principle of Care

Organic farming is managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment. Organic Farming is a living and dynamic system that responds to internal and external demands and conditions. Practitioners of Organic Farming can enhance efficiency and increase productivity, but this should not be at the risk of health and well-being. Consequently, new technologies need to be imposed and existing methods should be reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken.

This principle states that prudence and responsibility are the key concerns in management, development and technology choices in organic farming. Science is necessary to ensure that organic farming is healthy, safe and ecologically sound. However, scientific knowledge alone is not sufficient. Practical experience, collective wisdom, traditional and existing knowledge offer valid solutions, tested by time. Organic Farming should prevent particular risks by adopting appropriate technologies and rejecting unpredictable ones, such as genetic engineering. Decisions should reflect the values and needs of all who might be affected, through transparent and participatory processes.

The main principles of organic farming as laid down by IFOAM in 1992 are:

- To produce food of high nutritional quality in sufficient quantity.
- To interact in a constructive and life enhancing way with all natural systems and cycles.
- To encourage and enhance biological cycles within the farming system, involving micro-organisms, soil flora and fauna, plants and animals.

- To maintain and increase long term fertility of soils.
- To use, as far as possible, renewable resources in locally organised agricultural systems.
- To work, as far as possible, within a closed system with regard to organic matter and nutrient elements. This aims to reduce external inputs.
- To work, with materials and substances which can be reused or recycled, either on the farm or elsewhere?
- To give all livestock living conditions which will allow them to perform the basic aspects of their innate behavior?
- To minimize all forms of pollution that may result from agricultural practices.
- To maintain the genetic diversity of the agricultural system and its surroundings, including the protection of plant and wildlife habitats.
- To allow agricultural producers a living according to the UN human rights; to cover their basic needs and obtain an adequate return and satisfaction from their work, including a safe working environment.
- To consider the wider social and ecological impact of the farming system.

Q- DESCRIBE SCOPE OF ORGANIC FARMING IN INDIA AND WORLD

- 1) What exactly is organic agriculture? Is it the use of traditional farming practices instead conventional farming, using sustainable methods etc.?
- 2) Most of us think that the use of organic manures like green manure or natural plant protection by not using chemical fertilizers or pesticides is organic agriculture.
- 3) But this is not true the real meaning of the organic agriculture is just not confined to the word "agriculture" it has got much broader characteristics and impression capturing most of the biological and ecological aspects.
- 4) It believes at creating a strong foundation for the overlying spread so that the nourishment is provided through the natural biological process(crop rotation, crop residues, animal manure, planting with legumes, green manure, off farming organic) and not through the man-made supplements.
- 5) The whole organic agriculture is based on a very meticulous system where every organism involved inside is interdependent on each other for their own existence, creates balance in ecological cycle and lays down the substance for the sustainable growth.
- 6) The most recognised definition of the organic agriculture is given below "The term "organic" is best thought of as referring not to the type of inputs used, but to the concept of

the farm as an organism, in which all the components -the soil minerals, organic matter, microorganisms, insects, plants, animal and humans - interact to create coherent, self-regulating and stable whole. Reliance on external inputs, whether chemical or organic, is reduced as far as possible.

7) Organic agriculture proposes a huge commerce and trade opportunities in both developed and developing countries due to high demand of the organic product in market, its sustainable agriculture approach and also due to their salient support provided by the government and organization like the European Union and international federation of organic Agriculture Movements (IFOAM).

8) Developed countries are already at power to developing countries in organic sector due to their strong policy and strategies have established a stable market for them.

9) Organisation like NGO's and government bodies plays a very significant role in the development of organic agriculture in developing countries.

10) India is ranked number one in the highest producer worldwide and has some added advantage in organic agriculture, as the concept was already in practice many years ago until green revolution and still few parts of country has been following the traditional method now termed as "organic by default". Despite of these pluses the organic agriculture is still growing at very slow pace.

Global scenario

- World's total agriculture land account for 37.2 million hectare land. Australia leads the chart with 12 million hectare land followed by Argentina 4.40 million hectare and then USA 1.95 million hectare.
- Though in 2017 global market was hit by financial crisis all over but organic sales market did not stop, it did go slow but kept increasing at a fair rate.
- Organic product is concentrated specifically in North America and Europe which comprises 96 percent of global revenue. Countries holding the top position in organic market are USA, Germany and France.
- Australia, Argentina being the largest land holders under organics behind in the race of the organic market compared to other leading countries, due to the difference in the production and consumption patterns governed by consumer behavior hence consumerism plays an eminent role in the growth of the market.
- Among the total organic land two third is the grassland or grazing land of about

23.7 million hectare of land and arable land constitute about 6.1 million hectare of land which is approx. 17 percent of the total organic agriculture land.

- There were 1.6 million total producers in 2017. In which Africa shared 34 percent, Asia 29 percent and Europe 18 percent.

SCOPE OF AGRICULTURE IN INDIA

- India the land of 21 agro-ecological zones already has an added advantage in agriculture due to its different geography in climate and soil pattern facilitating the production of different variety of crops which is definitely a plus point from the point of view of diversity in organic product and market.
- Other additional advantages for going into organic in India are:
 1. Certain area referred as “organic by default” like mountains, north east areas as they already used traditional agriculture practices for years and have proved to be very good in production of crops as compared to the conventional farming
 2. India already holds a very strong position in the market for the quality of certain production like tea, spices, rice specialties and herbs so it does act as an additional credit in international market.
 3. Cost of labour is relatively cheap than the cost of input, in organic farming farmer is independent of the input cost but is of more labour intensive system Total producer statistic of Asia is 0.5, India share is 0.4 million producer and china with 0.1million.
- This makes India world number one in the largest producer, stands at 33rd position in area under organic farming and 88th in the ratio of agricultural land under organic crop to total farming area.
- The National Program for Organic Production (NPOP) was implemented by agricultural and processed food products export development authority (APEDA), the job of NPOP is to deal with documentation like National standards, accreditation criteria for accrediting inspection and certification agencies, Accreditation procedure, inspection and certification procedures and was only formulated after approval from National Steering Committee (NSC).

Lecture No- 7

Choice of Crops and Varieties in Organic Farming

The main problems in organic farming are inadequate mineral nutrition, poor competition with weeds and susceptibility to yield failure due to pests and pathogens. Good crop rotations, efficient sowing and harrowing technologies and specific fertilizers per crop are required for successful organic production. The choice of a crop variety suitable for local conditions may introduce better nutrient use efficiency, suppression of weeds and higher resistance and tolerance to pests and pathogens to the system. Reliability of yield production in local climatic conditions can also be improved by choice of variety.

Following points should be considered related to Choice of Crops and Varieties in Organic farming-

- i. All seeds and plant material shall be certified organic.
- ii. Species and varieties cultivated shall be adapted to the soil and climatic conditions and be resistant to pests and diseases.
- iii. In the choice of varieties, genetic diversity shall be taken into consideration.
- iv. When organic seed and plant materials are available, they shall be used but when certified organic seed and plant materials are not available, chemically untreated conventional seed and plant material shall be used.
- v. The use of genetically engineered seeds, transgenic plants or plant material is prohibited.

Q) Briefly narrate about Choice of Varieties in Organic Farming.

In Organic farming following points should be noted related Choice of varieties,

I) "The conventional varieties are unsuitable for organic agriculture"-

At present varieties suitable for organic production systems are available/certified for nearly all crop species. However, some breeding activities are going for specific characteristics, which may no longer be suitable for organic production systems (e.g. short straw in some cereals).

II) "Organic agriculture needs regionally adapted varieties."-

Adaptation of crops to regional soil, climate and production systems is an important variety characteristic. Breeding companies will always have to consider the additional benefit but also costs associated with developing a wide range of varieties which are adapted to very specific conditions and the seed production economies associated with varieties which can be used for a wide range of locations because of the need for profitability for the relatively smaller (organic) segment of seed market, breeding programmes for organic agriculture should initially focus on the development of varieties

suitable for many locations.

III) "The organic agriculture prefer to cultivate old varieties"-

Organic agriculture wants to share in the progress in crop breeding, because organic farmers equally depend on productivity and profitability. Although old varieties may be conserved more easily by organic agriculture e.g. varieties with a lack of resistance to lodging, a sufficient profitability of the cultivation of old varieties must be made possible by additional governmental grants (like already intended in some state programmes).

IV) "Organically preferred high Nutrient-use efficiency" varieties-

Organic systems often rely on organic matter based fertilizer inputs and mineralization driven N and P supplies to crops. Macronutrient availability patterns during the growing period therefore differ significantly from those in conventional systems. Organic crops often experience limited macronutrient (N and P) availability especially during periods when soil temperatures and water availability reduce mineralization capacity by the soil. However, regular organic matter inputs have shown to increase soil biological activity and biodiversity and associated mineralization capacity of the soil. Organic systems require crop genotypes that are able to form active symbiotic relationships with beneficial organisms in the rhizosphere, and thereby establish mechanisms that increase nutrient-use efficiency (e.g., vigorous root systems, ability to form active mycorrhizal associations, reduced root losses due to pathogens, ability to maintain a high mineralization activity in the rhizosphere via root exudates, increased rooting depth and associated ability to recover N leached from the top soil).

V) "Organically referred varieties for Weed competition"-

Weed management in row crops grown from transplants tends to be less problematic than in these crops grown from seed. This is due primarily to a more rapid development and associated competitiveness against weeds as well as the greater suitability of transplanted row crops for inter-row mechanical weeding methods. In terms of weed control, seedlings are small and may take longer than competing weeds to become established. Organic crop variety suitable for direct seeding in organic production systems should be plant types that would emerge and grow rapidly and shade neighbouring weed. Varieties with great diversity having cultivated morphological types and sufficient genetic variation should be present in the species while focussing on criteria of crop-weed competition and weed management.

VI) "Organic varieties tolerance to abiotic stress"-

Breeding for tolerance to the abiotic stresses is another important issue. Apart from

nutrient stress resistance, drought, salinity, aluminium toxicity and heat stress are other important abiotic stress factors that cause yield reductions. Breeding for drought and salinity tolerance has proved to be difficult as the mechanisms of tolerance are very complex and poorly understood. Nevertheless, drought tolerance, water-use efficiency and heat stress tolerance are already considered major breeding goals for crop production in marginal regions and agriculture institutes are now working on it.

VII) "Insect resistance Organic Varieties"-

As insecticides are not permitted under organic farming standards, organic growers apply alternative measures, e.g. cultural management tools. Alternative treatments can be applied (e.g., Bt) and barrier-based approaches to control invertebrate pests. One hypothesis is that insect predator species are able to traverse all leaf surfaces and encounter insect prey but other factors such as wax composition and colour may influence insect herbivory and ovipositor behaviour. The glossy phenotype has been associated with reduced tissue damage from thrips. Such useful varieties should be introduced in organic agriculture.

VIII) Varieties with high organic Quality-

The demand for organic products is partially driven by the belief that organically grown products are healthier and more nutritious than conventionally grown products. It is therefore important for a plant breeder developing varieties for the organic sector having nutritional quality parameters. Genotype \times environment interactions should therefore be considered when developing breeding programmes that focus on nutritional quality parameters, since selection under specific soil conditions may allow further optimization of nutritional quality.

XI) Organic varieties having rhizosphere competence for disease suppression should be adopted-

Resistance to soil- and seed-borne diseases and/or mechanisms to maintain disease suppressive organisms (e.g., plant-growth promoting rhizosphere (PGPR) bacteria, AM-fungi) in the rhizosphere are important traits in organic production because healthy root systems are required for crops to express their genetic potential for nutrient-use efficiency and yield. Recent research indicates that there is significant interaction between crop genotypes and soil microbial composition in the rhizosphere. Root exudates are an important plant mechanism that affects soil microbial composition. Also, significant efforts are needed to elucidate the potential of improving crop health and nutrition via beneficial plant \times soil \times microbe interactions before breeding programmes by targeting traits associated with such interactions in organic farming which may help for diseases

suppression.

Q) Briefly narrate about Choice of Crops in Organic Farming.

In Organic farming following points should be noted related Choice of crops,

I) The first step of organic farming in crop selection i.e. farm, climatic and soil conditions-

Choosing which crops to plant requires several factors to be considered, such as farm conditions, resources, and technology, storage, marketability and more.

What are the farm conditions?

When we speak about farm conditions we are considering soil and climatic conditions, as well as biotic factors.

What are the climatic conditions?

Climatic conditions include:

- temperatures
- rainfall
- relative humidity
- average hours of sunlight,
- other site-specific factors such as frequency of extreme weather conditions

What are the soil conditions?

Soil conditions include:

- soil texture
- colour
- organic matter content,
- pH
- fertility levels

This can be improved or altered through the addition of organic fertilizers, such as compost or manure.

II) The second step of organic farming in crop selection i.e. biotic and supply of water-

What are the biotic factors?

This refers to the living things within the ecosystem such as plants, animals, bacteria, fungi, etc. Is there a prevalence of certain pests or diseases? If so, you may want to choose crops that are more resistant.

Is there a stable supply of water?

While some locations are water abundant, others may require additional measures to supply water for crops.

III) Which crops are suitable to the existing farm conditions?

Especially with organic production methods, it will be very difficult to grow crops not suitable to the environmental conditions. A good place to start will be to **identify which crops are already grown in the region**. You may want to consult a neighbouring farm or visit a local farmers market. Once you've determined which species are suitable, you may want to consider different varieties under the same plant classification.

IV) If you intend to grow cash crops, which have the most potential for marketability and profit?

The first determinant is crop yield, how much (generally) of a specific crop can be produced on a designated unit of agricultural land. Keep in mind that different crops are higher yielding than others. As well, take into account inputs such as labour, fertilizers, resources, etc. that could affect the profitability of the crop. More traditional crops, which appeal to the widest consumer audience, may be the best option such as tomatoes, cucumbers, peppers, lettuce, etc. due to their widespread applicability. In addition, you may want to include specialty crops that can fetch higher prices such as heirloom varieties, nuts, sprouts, gourmet mushrooms, etc. Additionally, consider the current marketplace. Is there a strong competition for a certain crop? Is there a high demand for one variety? Which produce is "trendy"?

V) What are the available resources and technology?

Different crops may require different machinery. Depending on the scale of your farm, you may want to consider planting crops that require that same machinery or avoid plant varieties that require specialized equipment. Also, is there potential to borrow machinery and resources from neighbouring farms? This can also include manure in the case that you are not intending to also raise livestock on your farm. Knowledge is also an important resource, vital to successful crop growth. When selecting such plant types, ensure proper and sufficient knowledge of production requirements to increase the probability of high yields.

VI) What is the storage potential for each crop?

Depending on climatic conditions, different crops will be harvested at different points throughout the year. To ensure that you have a steady flow of available food to either sell or consumer yourself, choose at least some crops that are able to be stored for long-term periods without spoiling. This includes grains, root crops, and dry beans, which you can also use for other purposes such as to make flour.

VII) Resistance to pests and diseases-

Regardless of the purpose of farming, it is important to be able to select a crop and with wide resistance to important pests and diseases. The use of susceptible varieties may result to high cost of production or worst, total crop failure as organic pest and diseases control is slow process of pest and diseases control.

VIII) Security-

In the absence of security personnel or where there is no fence that will exclude intruders, crop selection may be done in favor of those which are not susceptible of thievery. This will avoid such crops as vegetables and fruit crops which can be easily harvested for food and for cash.

IX) Farming system-

Crop selection is affected by the system of farming employed, that is, whether purely crop farming or integrated with livestock animals. Likewise, the particular crop species to be grown will depend on the crop production practices such as monoculture, multiple cropping, hedge row-strip cropping, and planting patterns. If there is a plan to integrate crop production with free-range livestock, or where entry of stray animals is unhampered, it would be wise to install tree guards or fences. In intercropping, it is desirable that the component crops have complementary or mutualistic relation.

X) Having companion planting of crops in field-

Companion planting is based on the principle that some plant species thrive more when placed close to other specific types of plants than they do near others or by themselves. When done correctly, companion planting provides the potential to maximize space while providing a dually beneficial relationship for both plant species. Companion planting methods can be utilized for a wide variety of garden types: vegetables, flowers and even large growing fields, such as through the use of cover crops or crop rotations. In some cases, the principles of companion planting are based on chemical principles - based on the idea that some plants give off a chemical, which may enhance or discourage the growth of neighbouring plants.

In general, however, companion planting is most effective due to:

- the physical protection that plants provide each other from intense heat, wind or precipitation;
- the attraction of beneficial insects that prey on pests (by one or more of the companion plants);

- the nutrients that one plant naturally provides for another as well as enhancing soil;
- physical support provided (such as the case with the corn and beans)

Q) Briefly narrate about Choice of Crops and Varieties in Organic Farming.

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Q) Give factors influencing decisions on the selection of crops and varieties in Organic farming.

Farmers need to answer all the below questions while making decisions for choosing a crop/cropping pattern. During this decision making process, farmers cross check the suitability of proposed crop/cropping systems with their existing resources and other conditions. Thereby, they justify choosing or rejecting a crop/cropping systems. This process enables the farmers to undertake a SWOT analysis internally which in turn guides them to take an appropriate decision.

1. Climatic factors –

Is the crop/cropping system suitable for local weather parameters such as temperature, rainfall, sun shine hours, relative humidity, wind velocity, wind direction, seasons and agro-ecological situations?

2. Soil conditions –

Is the crop/cropping system suitable for local soil type, pH and soil fertility?

3. Water-

- Do you have adequate water source like a tanks, wells, dams, etc.?
- Do you receive adequate rainfall?
- Is the distribution of rainfall suitable to grow identified crops?
- Is the water quality suitable?
- Is electricity available for lifting the water?
- Do you have pump sets, micro irrigation systems?

4. Cropping system options-

- Do you have the opportunity to go for inter-cropping, mixed cropping, multi-storeyed cropping, relay cropping, crop rotation, etc.?
- Do you have the knowledge on cropping systems management?

5. Past and present experiences of farmers-

- What were your previous experiences with regard to the crop/cropping systems that you are planning to choose?

- What is the opinion of your friends, relatives and neighbours on proposed crop/cropping systems?

6. Expected profit and risk-

- How much profit are you expecting from the proposed crop/cropping system?
- Whether this profit is better than the existing crop/cropping system?
- What are the risks you are anticipating in the proposed crop/cropping system?
- Do you have the solution?
- Can you manage the risks?
- Is it worth to take the risks for anticipated profits?

7. Economic conditions of farmers including land holding-

- Are the proposed crop/cropping systems suitable for your size of land holding?
- Are your financial resources adequate to manage the proposed crop/cropping system?
- If not, can you mobilize financial resources through alternative routes?

8. Labour availability and mechanization potential-

Can you manage the proposed crop/cropping system through your family labour?

- If not, do you have adequate labours to manage the same?
- Is family/hired labour equipped to handle the proposed crop/cropping system?
- Are there any mechanization options to substitute the labour?
- Is machinery available? Affordable? Cost effective?
- Is family/hired labour equipped to handle the machinery?

9. Technology availability and suitability

- Is the proposed crop/cropping system suitable?
- Do you have technologies for the proposed crop/cropping system?
- Do you have extension access to get the technologies?
- Are technologies economically feasible and technically viable?
- Are technologies complex or user-friendly?

10. Market demand and availability of market infrastructure-

- Are the crops proposed in market demand?
- Do you have market infrastructure to sell your produce?
- Do you have organized marketing system to reduce the intermediaries?
- Do you have answers for questions such as where to sell? When to sell? Whom to sell to? What form to sell in? What price to sell for?
- Do you get real time market information and market intelligence on proposed crops?

11. Policies and schemes-

- Do Government policies favour your crops?
- Is there any existing scheme which incentivises your crop?
- Are you eligible to avail those benefits?

12. Public and private extension influence-

- Do you have access to Agricultural Technology Management Agency (ATMA)/ Departmental extension functionaries to get advisory?
- Do you know Kisan Call Center?
- Do you have access to KVKs, Agricultural Universities and ICAR organizations?
- Do you subscribe agricultural magazines?
- Do you read agricultural articles in newspapers?
- Do you get any support from input dealers, Agribusiness Companies, NGOs, Agriclincs and Agribusiness Centers?

13. Availability of required agricultural inputs including agricultural credit

- Do you get adequate agricultural inputs such as seeds, fertilizers, pesticides, and implements in time?
- Do you have access to institutional credit?

14. Post-harvest storage and processing technologies

- Do you have your own storage facility?
- If not, do you have access to such facility?
- Do you have access to primary processing facility?
- Do you know technologies for value addition of your crop?
- Do you have market linkage for value added products?
- Are you aware about required quality standards of value added products of proposed crops

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