CHAPTER - I

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 realised 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.

Modern organic farming has made up only a fraction of total agricultural output from its beginning until now. Increasing environmental awareness in the general public has transformed the originally supply-driven movement to a demand-driven one. Premium prices and some government subsidies attracted farmers towards the organic farming. In the developing world, many producers cultivate according to traditional methods which are comparable to organic farming but are not certified. In other cases, farmers in the developing world have converted for economic reasons.

‘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.

As a form of agriculture, organic farming relies on techniques such as crop rotation, green manure, compost, and biological pest. It uses natural sources of nutrients (such as compost, crop residues, and manure) and natural methods of crop and weed control, instead of using synthetic or inorganic agrochemicals. It is also called ‘low input farming’.

Organic farming is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. It combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Therefore, it is viewed as a method of farming which primarily concentrated in cultivating the land and raising crops without damaging the soil and in good health by use of crop, animal and farm wastes, aquatic wastes (organic wastes) and other biological materials along with bio-fertilizers to release nutrients to crops for increased sustainable production in an eco-friendly pollution free environment.

Organic farming does not refer only to growing crops without the use of artificial fertilizers and chemical pesticides; and does not mean that ‘just sits back and leaves it all to nature’. This mistaken belief leads to the common misunderstanding that organic gardens are wild, where every cabbage is riddled with holes and every flower blighted by mildew. In fact organic farmers do not just leave their gardens to nature. They use all the methods, techniques, and products at their disposal to work as much as possible with
nature. The main aim of organic farming is to create a healthy balanced environment in which plants can grow and thrive. Organic farming uses natural materials found on the farm to make land more productive. These materials are used to rebuild and maintain soil fertility. The organic farmer improves soil fertility through composting, proper cultivation of soil, rotation of crops, mixed planting, growing trees on the farm (agro-forestry). Organic matter is continuously added to the soil by plants, animals, and insects. Living organisms are essential for the growth of healthy plants and animals to thrive in such soil. The result is a balanced ecosystem, increased food production and fewer diseases for crops, animals and human beings.

**PRINCIPLES IN ORGANIC FARMING**

**FIGURE 1.1**

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 prosperous. 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 International Federation of Organic Agriculture Movements (IFOAM) has developed a set of international organic standards and guidelines about what organic farming is and how it should be practised on the farm, taking into account of different farming systems. 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 behaviour.

• To minimise 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.
ORGANIC FARMING: CHARACTERISTICS, METHODS AND TECHNIQUES

Organic farming works in harmony with nature rather than against it. This involves using techniques to achieve good crop yields without harming the natural environment or the people who live and work in it. The methods and materials that organic farmers use include

i. To keep and build good soil structure and fertility - recycled and composted crop wastes and animal manures, the right soil cultivation at the right time, crop rotation, adoption of poly-culture than monoculture, green manures and legumes, mulching on the soil surface; and

ii. To control pests, diseases and weeds - careful planning and crop choice, the use of resistant crops, healthy cultivation practice, crop rotation with multiple cropping approach, encourage useful predators that eat pests, increase genetic diversity, use of natural pesticides.

However, on an organic farm each and every technique need not be used. Depending up on the selection of the crop and time the farmer would use a range of organic methods at the same time to allow them to work together for the maximum benefit. For example, the use of green manures and careful cultivation, together provide better control of weeds than if the techniques were used on their own.

Organic farming methods mix scientific knowledge of ecology and modern technology with traditional farming practices based on naturally happening biological processes. Organic farming methods are studied in the field of agro-ecology. While conventional farming uses synthetic pesticides and water-soluble synthetically purified fertilizers, organic farmers are
confined by regulations to using natural pesticides and fertilizers. The principal methods of organic farming include crop rotation, compost, green manures biological pest control, and mechanical cultivation. These measures use the natural environment to improve the quality of agricultural productivity. Hardier plants are produced through plant breeding rather than genetic engineering.

**Soil Management**

Organic farming depends largely on the natural decomposition techniques like green manure and composting, to replace nutrients taken from the soil by previous crops. This biological process, operated by microorganisms helps the natural production of nutrients in the soil. Organic farming uses large number of methods to improve soil richness, including crop rotation, cover cropping, reduced tillage, and application of compost. By deducting tillage, soil is not inverted and exposed to air; less carbon is lost to the atmosphere resulting in more soil organic carbon. This has an added benefit of separating carbon which can minimize green house gases and assist in reversing climate change.

Plants need nitrogen, phosphorus and potassium, as well as micronutrients and helpful relationships with fungi and other organisms to bloom. Crop rotation and green manure (cover crops) help to provide nitrogen through legumes (more precisely, the *Fabaceae* family) which fix nitrogen from the atmosphere through symbiosis with rhizobial bacteria. Intercropping, which is sometimes used for insect and disease control, can also increase soil nutrients, but the competition between the legume and the crop can be problematic and wider spacing between crop rows is required. Crop wastes
can be ploughed back into the soil, and different plants leave different amounts of nitrogen, potentially aiding synchronization. Organic farmers also use animal manure, particular processed fertilizers such as seed meal and numerous mineral powders such as rock phosphate and greensand, a naturally occurring form of potash which provides potassium. Numerous bacteria and fungi break down chemicals, plant matter and animal waste into productive soil nutrients. In reaction, they will produce benefits of healthy yield and more productive soil for future crops. Fields with low or no manure expose significantly lower yields, due to decreased soil microbes, providing a healthier, more tillable soil system.

To produce a healthy crop an organic farmer needs to manage the soil well. This involves considering soil life, soil nutrients and soil structure. The soil is a living system. As well as the particles that make up the soil, it contains millions of different creatures. These creatures are very important for recycling nutrients. Feeding the soil with manure or compost feeds the whole variety of life in the soil which then turns this material into food for plant growth. This also adds nutrients and organic matter to the soil. Green manures also provide nutrients and organic matter. These are plants with high nitrogen content that are sown as part of a rotation and are dug into the soil when young. It is important to remember, however, that using too much animal manure or nutrient rich organic matter, or using it at the wrong time, could be as harmful as using man-made, artificial fertilisers. The organic farmer needs to cultivate the soil at the right time and in the right ways to provide the best living conditions for the soil life and plant roots.
Crop Diversity and Choice of Crops

Crop diversity is a great characteristic of organic farming. Conventional farming aimed at bulk production of a crop in single location and this practice is called monoculture. The science of agro-ecology has revealed the benefits of poly-culture (more than one crop in the same place), which is very frequently used in organic farming. Cultivating various kinds of crops increases overall farm health. It helps to protect against pests and diseases and acts as insurance against crop failure in unusual weather such as drought or flood. An organic farmer will try to grow a mixture of crops in the same field (mixed cropping, intercropping, strip cropping); grow different varieties of the same crop; use as many local crop varieties as possible; save the seed of local and improved crop varieties rather than relying on buying seed from outside the farm every year. It is important to keep in mind the selection of right crops at the right time.

Each crop and crop variety has its own specific needs. In some places it will grow well and others it will not. Crops are affected by soil type, rainfall, altitude, temperature, the type and amount of nutrients required and the amount of water needed. These factors affect how a crop grows and yields. If a crop is grown in a climate to which it is not suited, it is likely to produce low yields and be more susceptible to pest and diseases. This then creates the need to use agro-chemicals to fertilise the crop and control pest and diseases. To be successful an organic farmer learns to grow the crops and varieties which are suited to the local conditions, geography and climate. Growing the same crops in the same site year after year reduces soil fertility and can encourage a build up of pests, diseases and weeds in the soil. Crops should be moved to a
different area of land each year, and not returned to the original site for several years. For vegetables a 3 to 4 year rotation is usually recommended as a minimum. Crop rotation means having times where the fertility of the soil is being built up and times where crops are grown which remove nutrients. Crop rotation also helps a variety of natural predators to survive on the farm by providing diverse habitats and sources of food for them.

**Composting**

Compost is an organic matter (plant and animal residues) which has been rotted down by the action of bacteria and other organisms, over a period of time. Materials such as leaves, fruit skins and animal manures can be used to make compost. Compost is cheap, easy to make and is a very effective material that can be added to the soil, to improve soil and crop quality. Compost improves the structure of the soil that allows more air into the soil, improves drainage and reduces erosion. Compost improves soil fertility by adding nutrients and by making it easier for plants to take up the nutrients already in the soil. This produces better yields. Compost improves the soil’s ability to hold water and stops the soil from drying out in times of drought. It is understood that compost feeds soil life and improves soil structure, the beneficial effects are long lasting. Compost can reduce pests and diseases in the soil and on the crop. There are many ways to make compost depending on available materials and climate.

**Green Manures**

Green manures, often known as cover crops, are plants which are grown to improve the structure, organic matter content and nutrient content of the soil. They are a cheap alternative to artificial fertilisers and can be used to
complement animal manures. Growing a green manure is not the same as simply growing a legume crop, such as beans, in a rotation. Green manures are usually dug into the soil when the plants are still young, before they produce any crop and often before they flower. They are grown for their green leafy material which is high in nutrients and provides soil cover. They can be grown together with crops or alone. Green manures increase plant nutrients and organic matter, improve soil fertility, improve soil structure, improve the ability of the soil to hold water, control soil erosion, prevent weed growth and stop nutrients being washed out of the soil.

**Weed Control and Management**

In organic farming systems, the aim is not necessarily the elimination of weeds but their control. Weed control means reducing the effects of weeds on crop growth and yield. Organic farming avoids the use of pesticides, which leave harmful residues in the environment. Beneficial plant life such as host plants for useful insects may also be destroyed by pesticides. On an organic farm, weeds are controlled using a number of methods such as crop rotation, hoeing, mulches covering the soil, hand-weeding or the use of mechanical weeders, planting crops close together within each bed to prevent space for weeds to emerge, raising green manures or cover crops to outcompete weeds, carrying out soil cultivation at repeated intervals and at the appropriate time when the soil is moist, and letting animals to graze on weeds. It is, however, to be remembered that weeds do have some useful purposes - they can provide protection from erosion, food for animals and beneficial for insects.

Organic weed management promotes weed suppression, rather than weed elimination, by enhancing crop competition and phototoxic effects on
weeds. Organic farmers mix cultural, biological, mechanical, physical and chemical tactics to control weeds without any harmful chemical substances. Organic standards need rotation of annual crops, which means a single crop cannot be grown in the same location without a different, intervening crop. Organic crop rotations very often include weed-suppressive cover crops and crops with dissimilar life cycles to discourage weeds associated with a particular crop.

**Careful Use of Water**

In arid lands, the careful use of water is very much a part of organic growing technique. As with other resources, organic farmers try to use water which is available locally, avoiding using water faster than it is replaced naturally. There are many ways to use water carefully, including: the use of terracing, rain water basins or catchments and careful irrigation; the addition of organic matter to the soil improves its ability to hold water; and the use of mulches to hold water in the soil by stopping the soil surface from drying out or becoming too hot.

**MERITS OF ORGANIC FARMING**

Organic farming increases long-term soil fertility, controls pests and diseases without harming the environment, ensures that water stays clean and safe, produces nutritious food, feed for animals and high quality crops to sell at a good price and use resources which farmer already have, thus needs less money to buy farm inputs. It enables the farmers use all the knowledge, techniques and materials available to work with nature, thereby creates a healthy balance between nature and farming where crops and animals can thrive. Organic farmers are taught not to see every insect as a pest, every plant
out of place as a weed and the solution to every problem in an artificial chemical spray. The aim is not to destroy all pests and weeds, but to keep them down to an acceptable level and make the most of the benefits to our modern organic farming techniques.

Pests and diseases are part of nature. Pesticides do not solve the pest problem. In the past 50 years, insecticide use has increased tenfold, while crop losses from pest damage have doubled. Chemical pesticides can quickly find their way into food chains and water courses. This can create health hazards to living being. Human health can also be harmed by eating foods (especially fruit and vegetables) which still contain residues of pesticides that were sprayed on the crop. There is also much concern for those people using chemical pesticides. There are a number of harmful effects that chemical pesticides can have on the environment. Use of natural pest and disease control is often cheaper than applying chemical pesticides because generally natural methods do not involve buying materials from outside. Products and materials are already in the home or around the farm. Hence natural method of bio pesticides cost is lower than chemical pesticides. Through careful planning and use of available techniques sprays made from chillies, onions, garlic or neem would help to manage the situation.

**STATEMENT OF THE PROBLEM**

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 realised 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. Chemical fertilisers provide only short term nutrient supply to crops - encourage plants to grow quickly but with soft growth which is less able to withstand drought, pests and disease. These fertilisers do not feed soil life and do not add organic matter to the soil. This means that they do not help to build good soil structure, improve the soils water holding capacity or drainage.

Chemical fertilisers and herbicides are easily washed from the soil and pollute rivers, pond and water courses. The prolonged use of chemical fertilisers results in soils with a low organic matter content which is easily eroded by wind and rain. The chemicals destroy soil micro-organisms resulting in poor soil structure and aeration and decreasing nutrient availability. Pests and diseases become more difficult to control as they become resistant to artificial pesticides. Artificial fertilisers provide only short term nutrient supply to crops. They encourage plants to grow quickly but with soft growth which is less able to withstand drought, pests and disease. Chemical fertilisers do not feed soil life and do not add organic matter to the soil. This means that they do not help to build good soil structure, improve the soils water holding capacity or drainage. The inorganic pesticides can stay in the soil for a long time and enter the food chain where they build up in the bodies of animals and humans, causing health problems.

Organic farming system has been designed to enhance biological diversity within the system, increase the soil-biological activity, maintain long
term fertility, recycle the plant and animal waste, rely on the renewable sources in locally organised system and to promote healthy use of soil, water and air and minimise all forms of pollution. Organic farmers have to use all the knowledge, techniques and materials available to work with nature so as to create a healthy balance between nature and farming, where crops and animals can thrive. An organic farmer must not see every insect as a pest, every plant out of place as a weed as the aim is not to destroy all pests and weeds, but to keep them down to an acceptable level and make the most of the benefits to the organic farming techniques.

Organic farming is the need of hour. It provides long-term benefits to people and the environment. Sustainability is the key to success of organic farming. To ensure sustainability in organic farming the government as well as NGOs took sincere efforts to promote the awareness about organic farming and to train the farmers. The government’s subsidy motivated number of farmers to go for organic farming in their fields. They were also trained in preparation of vermin-composts and bio-pesticides. The SHG’s were also roped in the campaign for promoting organic farming practices. It is observed that the organic farming does not require additional work force, which is a saving grace for the farmers to get away with the short supply of farm hands.

Organic farming is a process of developing a viable and sustainable agro-eco system, which can achieve sustainable productivity without the use of artificial external inputs such as chemical fertilizers and pesticides. Its primary objective is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people. The sustenance and growth of organic farming mainly depend on the level of awareness among
farmers and general public and the encouragement received from the Government and the NGOs. Likewise, availability of natural resources as well as human resources will also bring out greater impact on organic farming. Hence, with this understanding and expectation a detailed study about Tirunelveli district, organic farming and self help groups is attempted.

Tirunelveli district is ideal for understanding such a study as agriculture is the mainstay of life for about three-quarters of its rural population. Canals, tanks, tube wells and open wells are the common sources of irrigation in the district. Organic farming is fast gaining popularity in Tirunelveli district owing to various reasons, primarily because of maximum production with minimum cost for producing unpolluted farm produces. However, most of the farmers, who were sceptical about its success, were initially reluctant to adopt organic farming practices because of poor yield. But increase in demand for organically grown fruits, vegetables and food grains from the public changed the outlook of the farmers. The government-supported National Horticulture Mission (NHM) extended an attractive subsidy, many farmers started cultivated banana, sapota, mango, amla, guava, in addition to vegetables such as brinjal.

The present research study aims at understanding the problems and prospects of organic farming practiced by the farmers who are also associated with Self Help Groups in Tirunelveli District by finding out answers to the following questions:

1. What are the factors motivating the farmers to go for organic farming practices?
2. What is the socio-economic background of these farmers?
3. What is the supportive role of Self Help Groups (SHGs) in motivating its members to go for organic farming?

4. What are the problems and prospects of organic farmers and organic farming in the study area?

5. What are the factors/variables working in favour of and also against the organic farmers and organic farming in the study area?

CHAPTER SCHEME

The presentation of report of the study has been organised in eight chapters as given below:

Chapter I provides an introduction to organic farming with its principles, characteristics, methods, techniques and merits in addition to statement of the problem under study.

Chapter II presents a brief review of the relevant literature regarding the subject taken for the present study. It includes the reviews relating to organic farming, involvement of SHGs and NGOs in the promotion of organic farming and the success stories of the organic farmers.

Chapter III deals with the methodology part which includes objectives of the study, scope of the study, operational concepts of the study, sampling plan, hypotheses, data collection and plan of analysis, limitations and usefulness of the study.

In Chapter IV a brief profile of the area selected for the present study has been described.

Chapter V portrays the socio-economic status of the SHG members of the study in addition to the factors influencing them to go for organic farming.
Chapter VI offers an insight into the perception of the SHG members about organic farming.

Chapter VII brings out the problems faced by the SHG members and prospects of organic farming from the respondents’ perspective.

The summary of findings based on the analysis of the study and the suggestions based on the findings of the study is included in Chapter VIII.