

Organic Farming: An Eco-Friendly Technology and Its Importance And Opportunities in the Sustainable Development

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Abstract: With increase in cost of production inputs, inorganic fertilizers became increasingly more expensive. Another issue of great concern was the sustainability of soil productivity as land began to be intensively tilled to produce higher yields under multiple and intensive cropping systems. Waterlogging and secondary salinization have been the banes associated with excess and irrational irrigation. Groundwater table declined sharply as more and deeper bore wells were drilled. Recharging of groundwater has also been reduced due to severe deforestation. Indiscriminate use of chemical pesticides to control various insect pests and diseases over the years has destroyed many naturally occurring effective biological control agents.

Key words: Green Revolution; Organic farming; food and nutrition security;

I. INTRODUCTION

During the era of Green Revolution, introduction of high-yielding varieties, extension of irrigated areas, use of high analysis NPK fertilizers and increase in cropping intensity, propelled India towards self-sufficiency in food production. In the process, relative contribution of organic manures as a source of plant nutrients vis-à-vis chemical fertilizers declined substantially. An increase in resistance of insect pests to chemical pesticides has also been noticed. Health hazards associated with intensive modern agriculture, such as pesticides residues in food products and groundwater contamination are matter of concern. The occurrence of multi-nutrient deficiencies and overall decline in the productive capacity of the soil due to no judicious fertilizer use, have been widely reported. Such concerns and problems posed by modern-day agriculture gave birth to new concepts in farming, such as organic farming, natural farming, biodynamic agriculture, do-nothing agriculture, eco-farming, etc. The essential feature of such farming practices imply, i.e., back to nature.

Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes, the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system (FAO, 1999). By ensuring that women have the same access to productive resources and farming as men, women could increase yields on their farms by 20 percent to 30 percent; this could reduce the number of hungry people worldwide by 100 to 150 million. Sustainable food and agriculture policies aim to improve the efficiency of agricultural production systems while at the same time preserving the diverse ecosystem services upon which the world's food supply depends (e.g. agricultural lands, soil nutrients, forests and oceans, climate regulation, and biodiversity, etc.) These twin objectives are central to the health goals of ending hunger/under nutrition and achieving long-term food and nutrition security for all.

Thus, widespread environmental degradation, severe poverty around the globe and the burning concerns about achieving and maintaining good quality of life were the principal factors for taking interest in intergenerational equity, in relation to access to natural resources. So, the necessity of having an alternative agriculture method which can be functioned in a friendly Ecosystem while sustaining and increasing the productivity is talk of the day among not only agricultural scientists

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but also even common men - Organic farming is recognized as the best known alternative. It is economically feasible to practice when the farmers are able to get premium price for their product. The cost of cultivation will be reduced by not depending upon the purchased off-farm inputs. Low productivity in the transition stage needs research activities in the national and international level. Organic farming is not only revival to the farming community, it also revival to the consumers to lead a "Healthy and Happy life". So a paradigm shift to Organic farming is the need of the day to enhance the quality of life.

II. ORGANIC FARMING PROSPECTS

It is a matter of fact that the modern agriculture is based on the use of high yielding varieties of seeds, chemical fertilizer, irrigation water, pesticides etc. to satisfy the ever growing demand for food grains not only to fulfil the problem of food security but also to earn foreign exchange at the cost of environmental quality which cannot be sustainable in future because of the adverse changes being caused to the environment and ecosystem. The term 'organic' was first used in relation to farming by Northbourne (1940) in his book *Look to the Lad*. Over the past five years, the world has been hit by a series of economic, financial and food crises that have slowed down, and at times reversed, global efforts to reduce poverty and hunger. Today, price volatility and global weather shocks continue to severely undermine such efforts. In this context, promoting livelihood resilience and food and nutrition security has become central to the policy agendas of governments. As most good agricultural land has already been farmed and the region have exceeded the safe limit, the natural resources availability for further farming expansion is practically exhausted. Smallholder farmers need to be at the center of this agenda, and to play a leading role in the investment efforts needed to achieve it. Organic development denotes a holistic system of lifestyle which optimizes productivity in a sustainable manner. Organic technologies are environmentally safe, economically viable and socially replicable. Organic farming is essentially an agriculture employing a knowledge/understanding of naturally occurring processes. Organic practice maintains soil health, re-enliven soil fertility and balances useful and harmful insect-pests ratio. About 74% farmers in India are small and marginal farmers. Organic practice is most relevant to them. The activated and technically upgraded organic farming is known as biodynamic farming. Bio-Farming practices in general and Biodynamic Farming system in particular are increasingly proving to the sustainable farming practice in many countries as well as in different parts of India. Biodynamic agriculture is a cost effective and techno-economically viable, export friendly, farm friendly, eco-friendly farming system. Thus is adoptable and sustainable. Organic farming address the needs of poor and food insecure people by ensuring their access to adequate food at all times through nutrition- and gender-sensitive safety nets; strengthening their access to land, water and other productive assets; building their capacities for sustainable agricultural intensification in the face of multiple natural resource challenges and climate change; enabling them to market their produce on more favourable terms; assisting them to reduce the amount of food they lose post-harvest; strengthening their ability to find economic opportunities off the farm; and supporting them to use the locally produced food they have to improve the nutritional status of all family members. They need to be protected from food price volatility and empowered to manage risks and shocks. There are about half a billion smallholder farms worldwide. In many developing countries, the overwhelming majority of farms are small and family-run, and they produce most of the food consumed locally. Smallholders are also by far the main investors in agriculture in most of the developing world.

III. ECO-FRIENDLY TECHNOLOGY

Organic farming is a form of agriculture, which avoids the use of synthetic inputs such as synthetic fertilizers, pesticides, herbicides, and genetically modified organisms, plant growth regulators and livestock feed additives. As far as possible organic farmers rely on crop rotation, crop residues, animal manures, and mechanical cultivation to maintain soil productivity, supply plant nutrients and to control weeds, insects and other pests. In other words the role of organic agriculture whether in farming, processing, and distribution is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings. The British Botanist Sir, Albert Howard is often called "the father of modern organic agriculture". He was one of the first to point out advantages of organic farming over modern techniques in his book, "An Agriculture Testament".

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Organic farming methods combine scientific knowledge and modern technology with traditional farming practices based on thousands of years of agriculture. Organic farming relies heavily on the natural break down of organic matter, using techniques like green manure and composting, to maintain nutrients taken from the soil by the previous crops. Organic farming uses a variety of methods to improve soil fertility, including crop rotation, cover cropping, and application of mulching. In chemical farming a specific insecticides may be applied to quickly kill off a particular insect pest but this encourages rapid natural selection of resistant insects, plants and other organisms, necessitating increased use or more powerful control measures.

In contrast, organic farming tends to tolerate some pest populations while taking a longer-term approach. Organic farming, organic pest control involves techniques like encouraging predatory beneficial insects and microorganisms, careful crop selection and crop rotation. Each of these techniques also provides other benefits- soil protection, fertilization, pollination, water conservation etc. These benefits are both complementary and cumulative in overall effect on farm health. However, there are various major advantages of organic farming:-

1. It increases productivity at lower cost

There is misconception among the people that organic farming leads to loss in productivity. It is also proven that after a short period of drop in yields, organic farming is more productive than chemical farming.

2. Environmental friendly

Conventional agriculture based on chemical farming is rapidly depleting natural resources particularly fresh water, soil, air and fossil fuels. In chemical farming there is also use of large quantities of pesticides, fertilizer etc. and there is also water wastage through high volume irrigation, heavy use of petrochemicals for farm machinery and long distance transport etc. but organic farming curtails all these.

3. It reduces food contamination and increased food equality

Conventional agricultural practices based on chemical fertilizer causing greater contamination of food in absence certification and in the wake of unhygienic handling. But in organic farming there is such problems: To promote organic farming in India, the Central Government has set up National Institute of Organic Farming in 2003, in Ghaziabad, Uttar Pradesh, the purpose of this institute is to formulate rules, regulation and certification of organic from products in conformity with international standards the institute has appointed Agricultural and Processed Food Products Exports Development Authority.

The different certifying agencies for organic products are working in different regions. They will be accountable for confirming that any product sold with the "India organic" logo is in accordance with international criteria. Organic farming has also been identified as a major thrust area of the 10th Plan of the central government and for this one billion rupees have been allocated to the National Institute of Organic Farming alone.

IV. QUALITY FOOD

The term "food security" was first used in the international development literature of the 1960s and 1970s. Food security, an important element of poverty alleviation, is a priority focus of sustainable development. World Food Summit in 1996 defined food security as a situation in which "all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Food security brings into focus the linkage between food, nutrition and health. Food security and nutrition situation in the new millennium showed that the country had been self-sufficient in food grain production for four decades and the threat of famine has been eliminated. But today, with just under 1 billion people going hungry every day, we still have a long way to go. The projected growth in the world's population to 9.2 billion by 2050 adds an extra challenge for food security. Burgeoning populations mean more demand for food, water and land at a time when the natural resource base for agriculture is being degraded, large areas of farmland are being diverted from food crop production, and climate change threatens to further reduce agriculturally viable land. Food insecurity, mostly seasonal, was confined to poorer segments in remote areas; hunger had been reduced and energy needs met by food grains. But pulses critical to meet protein needs in populations subsisting on vegetarian diets, were expensive and consumption had come down. Vegetables intake which is essential to provide the needed micronutrients continued to be low. Low dietary intake is the major factor responsible for under nutrition but nutrient loss associated with infections comes a close second. Potable water supply and sanitation are critical for prevention of infections. Health care for early

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detection and effective management of infections can reduce under nutrition due to infections. India has been self-sufficient in food production since seventies and low household hunger rates.

V. MICRO-NUTRITION

India has been in the forefront in developing national food and nutrition databases, undertaking research studies and surveys documenting the ongoing agriculture, food, nutrition and health transitions. Human health is directly affected by environmental degradation and climate change, undermining the right to health. Promoting universal access to health care and healthy environments (including water and sanitation, clean air, etc.) can significantly minimize these impacts. The promotion of health benefits of greenhouse gas mitigation policies in sectors such as energy, transport, food and agriculture, water and housing will reduce the adverse effects of climate change on health. Health indicators can bolster accountability for the social impacts of development policies, contributing to governance for sustainable development. Food policies should also consider nutrition and health as an outcome, including communicable and non-communicable diseases. Smallholder farmers can significantly contribute to economic growth, as well as to reducing poverty and ensuring food and nutrition security. Biodynamic (BD) crops products contain more vitamin C, iron, magnesium and phosphorus than conventional crops products, contains significantly less nitrates. Organically grown crops shows better protein quality, higher content of nutritionally significant minerals and lower amount of heavy metals. To be sustainable there should be successful management of resources i.e. it must produce adequate high quality food, be environment friendly, protect the soil, and be profitable and socially viable. Biodynamic crops products contain more vitamin C, iron, magnesium and phosphorus than conventional crops products, contains significantly less nitrates, BD grown crops shows better protein quality, higher content of nutritionally significant minerals, lower amount of heavy metals. Food and nutrition security means equitable access for all people to high quality food rich in micronutrients and containing the minimum amount of additives and chemical residues (e.g. pesticides, fertilizers, hormones, antibiotics, etc.) needed to ensure optimal production without compromising human health. Inadequate food and poor health are two direct factors contributing to under nutrition. Major achievements have been reached that most of the people in the world receive sufficient food to meet their energy requirements. However, energy is not sufficient to ensure good nutrition. Adequate micronutrients must also be available. Among the most important micronutrients are: iron, vitamin A, and iodine. Indisputably, iron deficiency is a major public health nutrition problem. According to the estimation of WHO, about 5 billion people suffer currently from iron deficiency - about 80% of the world's population.

VI. SUSTAINABLE DEVELOPMENT

The basic dimension of sustainable development is environmental, social and economic. Animal manure is the natural soil conditioner & amendment agents. Livestock play multifaceted roles strengthening indigenous agricultural practices, organic farming and generating income and livelihoods for large masses of rural India. However, with the advent of modern mechanized technology in agriculture, livestock population in our country is rapidly declining by 10-30%. FAO strongly advocates that improved pasture and range land management practices are essential not only for supporting livestock production but also for restoring carbon pool, nutrient cycling and soil quality. Thus organic farming supports natural resources & their sustainability. In India small farm holders constitute over 70% of farming community are potential organic farmers. If a proper guidelines on organic inputs, organic, certification and input cost coupled with capital-driven regulation by contracting firms strongly discourage. In terms of sustainability, the negative effects of changing temperatures and precipitation on agricultural production, food security, and under nutrition in developing countries has been described as the largest single negative impact of climate change on global health (McMichael A, et al., 2004)

The quality-controlled bio-products are better targeted to global markets and will certainly boost the India's share in the global trade, which is less than 1%. Diversifying agriculture practices could further improve the agribusiness sector. The biodynamic agriculture and organic farming are similar in that both are ecologically oriented and do not use chemical fertilizers, pesticides and weedicides. The main difference between the two is that in biodynamic agriculture eight different preparations (BD500-507) are used, with the cosmic forces, mainly the influence of the moon and the planets through the biodynamic planting calendar, which makes it an activated organic farming system. Biodynamic farming practices rejuvenate and re-enliven the earth so that it could continue supporting a healthy plant and animal life. It is sustainable and

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promotes natural resources i.e. produce adequate high quality food, environment friendly, protect the soil, and socially viable.

VII. BIO-FARMING FOR SUSTAINABLE DEVELOPMENT

1. Farm Friendly Technology

In comparison of the conventional farm the biodynamical farm soils has better physical, chemical and biological properties such as the soil texture, depth and porosity, water holding capacity, organic matter content. The organic matter content, soil respiration, mineralizable nitrogen, and the ratio of mineralizable nitrogen to organic carbon are reported to be higher on the biodynamic farms i.e. higher microbial activity and thicker topsoil on biodynamic farms. Earth worms which are also called as farmer's farm factory are reported to be more than 25 times in number and 8 times in weight on the biodynamic farms as compared to the conventional farm. These characteristics make the biodynamic technology more a farm-friendly technology.

2. Export -Friendly Agriculture

The biodynamic farm products are certified organic or biodynamic products-Demeter certification. These bio-grown products are free from all the chemicals. The produce has better nutritive values, taste and due to the natural growth they have good storage capacity. Even perishable vegetables and other produce last longer on biodynamic farms. The demand of biodynamic produce is increasingly growing in the national and international market. In most of the developed countries only certified food and agro-products are now getting entry and recognition. The cost of the bio-dynamically grown produce fetches premium price up to 25% to 35% higher than the market price of a similar conventional product. As now the economic stability is one of the most significant characteristics of sustainable farming system the biodynamic farm promises a better alternative because of its greater enterprise diversity and less year-to-year variability in gross revenue. In general at a biodynamic farm net returns are about 40% higher than their conventional counterparts.

3. Eco-Friendly

Biodynamic agriculture technology not uses any sort of chemical application and the focus is on balance natural growth and recycling of natural resources. The preparations are produced from the plant parts and most of the applications are based on ecological principles. Organic farming helps to adopt a climate justice approach. Although, commercial organic agriculture with its rigorous quality assurance system is a new market controlled, consumer-centric agriculture system world over, but it has grown almost 25-30% per year during last 10 years. In spite of recession fears the growth of organic is going unaffected. The movement started with developed world is gradually picking up in developing countries. But demand is still concentrated in developed and most affluent countries. Local demand for organic food is growing. India is poised for faster growth with growing domestic market. Success of organic movement in India depends upon the growth of its own domestic markets

4. Sustainable

Organic agriculture is a good farming system and development concept for achieving sustainability in agriculture. National Planning Commission of India in 2000 recognized organic farming as a thrust area. Sustainable agriculture integrates three main goals- environmental health; economic profitability; and social and economic equity. Among the available technologies such as organic agriculture, biotechnology etc., the challenge is to decide suitable, affordable, and competitive technology. Cycling of nutrient and quality farm produce in adequate amount with the entire environment safety and profit characters make organic farming system as sustainable. India has traditionally been a country of organic agriculture, but the growth of modern scientific, input intensive agriculture has pushed it to wall. But with the increasing awareness about the safety and quality of foods, long term sustainability of the system and accumulating evidences of being equally productive, the organic farming has emerged as an alternative system of farming which not only address the quality and sustainability concerns, but also ensures a debt free, profitable livelihood option.

5. Adoptable

The biodynamic agriculture is an activated system of organic farming. Most of the preparations are quite easy to prepare and based on the local resources. The preparations, understanding and application are easy and adoptable. In this farming

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system approach a piece of land is used optimally and to its fullest potential to produce a range of nutritious and healthy food as well as other required commodities in a manner which can healthily feed a small family, and maintain soil health and productivity by agricultural practices based on principles of nature. Pests (both insects and diseases) are also controlled and managed by the selection of crop mixes and using biological control measures.

6. Climate change

Organic agri-biotech combats climate change. Climate change will increase the risk of hunger and under nutrition over the next few decades and will challenge the realization of the human rights for health and adequate food. With a change in patterns of extreme events such as heat waves, droughts, floods, and other disasters, vulnerable communities will suffer serious setbacks in terms of food and nutrition security. With large land area and climate diversity, India has a considerable potential to contribute to Csequestration. The soil organic carbon (SOC) in cultivated soils is less than 5 mg g^{-1} compared to 1520 mg g^{-1} in uncultivated soils. This available potential of 1015 mg g^{-1} soil-C sink could balance net emission from fossil fuel combustion.

7. Marketing

The mechanism of organic marketing is quite different from that of regular marketing. Careful selection and development of large markets and distribution channels are of utmost importance. Such marketing requires not only additional costs but also specialized skills, know-how and experience — all of which the unorganized individual farmers are usually incapable to develop (Kasturi, 2007). About 85 per cent of the total organic production in the country heads for the export market. The domestic market for organics is thus undeveloped in India. Lack of domestic marketing channels adds to the difficulties faced by the farmers converting to organic methods in agriculture. Market access for small producers depends on (a) understanding the markets, (b) organization of the firm or operations, (c) communication and transport links, and (d) an appropriate policy, environment. In this changing scenario, small farmers mainly need better access to capital and education. Management capacity, which is as important as physical capital, is the most difficult thing to provide. Further, collective action to deal with scale requirements needs to be designed in order to satisfy new product and process standards or to avoid exclusion from the supply chain. Collective action through cooperatives or associations is important to be able to buy and sell at a better price and also to help small farmers in adapting new patterns and facing much greater levels of competition. Small farmers require professional training in marketing as well as in the technical aspects of production. There is also a need to strengthen small farmer organizations and provide them with technical assistance to increase productivity for the cost-competitive market and to provide help in improving the quality of produce in order to capture value addition in the supply chain (Singh, 2006).

8. Policy Support

Policies have long focused on generating external solutions to farmers' needs. It has encouraged dependencies on external inputs, though they are more costly, environmentally damaging, and therefore, economically inefficient when compared to the resource-conserving options (Jules, 1995). Reddy (1988) has pointed out that the modern agriculture is like a cracked earthen pot, which cannot be put to good use any more. New policies must be able to create the conditions for development based more on locally available resources and local skills and knowledge. Policy makers will have to find ways of establishing dialogues and alliances with other actors so that the farmers' own analyses could be facilitated and their organized needs articulated. Dialogue and interaction would provide a rapid feedback, allowing policies to be adapted alternatively. Agricultural policies could then focus on enabling people and professionals to make use of the most of the available social and biological resources. Despite serious efforts of some NGOs, it appears that India is lagging far behind in the adoption of organic farming. For laying the spadework for the spread of organic agriculture in the country, certain issues require attention at the government policymaking levels. These include (a) substantial financial support by the governments which is absolutely necessary to promote organic farming; (b) market development for the organic products which is a crucial factor to promote domestic sales; (c) government support to the producer and consumer associations to market the organic products; (d) simplification of the process of certification; and (e) reduction in certification cost. A vigorous campaign to highlight the benefits of organic farming against the conventional system is essential to increase awareness of both farmers and consumers (Narayanan, 2005). There is no mention of organic farming in the National

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Agricultural Policy. Organic farming offers an alternative method for production that can be suitably exploited to benefit some segment of farmers (Chand, 2003). However, certification of organic products becomes dubious if it is linked with high documentation, controlling, organizational and bureaucratic effort (Julia et al., 2008). In Chhattisgarh, through various initiatives, the government has been promoting the cultivation of medicinal, aromatic and dye plants, apart from agricultural and horticultural produce. Being a herbal state, there is a lot of scope for promoting organic farming. The Chhattisgarh Vanoushadhi Board or the Medicinal Plants Board, the Departments of Horticulture and, Agriculture, and Chhattisgarh State Minor Forest Produce Federation are some of the state government agencies promoting organic cultivation of agricultural, horticultural, medicinal and aromatic crops (Rao and Larja, 2005). Even in places where organic farming is facilitated without any direct government initiative, the state may still have some important roles to play for the following reasons:

1. NGOs may not always have the necessary business skills to succeed in marketing. Under such situations, collaborations between NGOs and governments may be effective.
2. Companies involved in contract farming arrangements with organic farmers need to be extremely effective and skillful at reaching organic markets. However, there may be a trade-off involved between the profit motives of the private companies and the best interests of the farmers. Hence, it is extremely important for the state to create an appropriate legal framework that enforces contracts and provides for a trustworthy and effective arbitration in the best interests of the resource-poor and unorganized farmers.
3. Formation of farmers' organizations has been found to be extremely beneficial for upholding the farmers' interests. However, it requires considerable support on a number of levels, including start-up costs, operational expenses, training and marketing. The state government or the NGO sector may assist in these respects.
4. Organic agriculture may also flourish under direct government involvement. While it has suffered downright neglect by the central government, a number of state governments have already made significant strides in organic farming.

The governments of the mountainous states of Sikkim, Mizoram and Uttarakhand have undertaken significant initiatives to turn their states completely organic. State government initiatives in some form have also been taken in Karnataka, Madhya Pradesh, Arunachal Pradesh, Meghalaya, and Punjab. In the "Uttarakhand organic" initiative, a multi-pronged strategy—the organic model—has been promoted not only as an agricultural technology, but also as an integral part of several rural development projects. Moreover, while export is not outside the purview of this initiative, significant emphasis has been placed on domestic market development as well. Although it is too early to comment on this programme, it seems that if implemented successfully, the project could become a role model for state-driven organic development in India (Kasturi, 2007).

9. Prospects for Organic Farming in India

India is endowed with various types of naturally viable organic form of nutrients across different regions of the country which will be helpful in organic cultivation of crops (Butterworth et al., 2003; Reddy, 2010b). This will help substantially in organic cultivation of crops. There is a wide diversity in climate and eco-system. India has a strong traditional farming system with innovative farmers, vast dry lands and least use of chemicals. Infact, the rained tribal, north-east and hilly regions of the country where negligible chemicals are used in agriculture, have been practicing subsistence agriculture for a long period; such areas are organic by default

10. Special Benefits of Organic Farming in the Dry lands of India

Organic farming has assumed immense significance in the dry land areas also. Soil and climatic conditions in India's dry lands make them particularly well suited to organic agriculture. These marginal lands, with their marginal soils do not respond well to intensive farming practices. These are actually better suited to low-input farming systems that make ample use of the biodiversity (Sharma, 2000; Pionetti and Reddy, 2002). In turn, organic farming with its central focus on maintaining and improving soil health, its avoidance of pollutants, and its reliance on local inputs and labor, can materially advance the economic and ecological health of the dry lands, as well as people who live there. Semiarid and arid dry land soils typically are poor in water-holding capacity as well as organic matter (Sharma, 2000). In some areas, depth of the soil

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is another limiting factor for agricultural production. Addition of organic matter, a corner stone of organic farming practices, will not only improve the physical condition of these dry land soils, but also greatly improve their ability to supply balanced plant nutrients. In dry lands, there is over-exploitation of natural resources (Reddy, 2000) mainly because of inappropriate production-enhancing technologies (Dhir, 1997). For example, use of tractor increases wind erosion and damages natural regeneration of trees and grasses. Over-use or improper use of canal irrigation can cause waterlogging and salinity. Excessive groundwater pumping has decreased the groundwater table drastically in tube-well irrigated areas. In many locations where intensive-input agriculture systems are followed, soil fertility is decreasing and certain severe pests are becoming resistant to synthetic pesticides (Butterworth et al., 2003). These are all indicators of improper land use, leading to desertification; adoption of organic farming practices suitable for dry lands can help to ameliorate these conditions. Due to climatic variability, farming systems in dry lands traditionally use a mix of crops, trees, animals, and grasses. Such diversified systems have been found efficient in nutrient recycling and restoration of soil fertility—the basic aims of organic farming; they minimize pest incidence as well. Furthermore, India's traditional farmers possess a rich body of wisdom, based on long observation and practice, concerning soil fertility and pest control management; this can be used to strengthen organic systems (Sharma and Goyal, 2000; Adolph and Butterworth, 2002; Butterworth et al., 2003; Reddy, 2010b). These two factors will also aid the quick development of more efficient, more productive organic farming systems in these areas. In terms of input supply, the dry lands are very rich in local resources that are suitable for supporting organic

VIII. CONCLUSION

With increasing concerns about the environment, economic and social impact of chemical –dependent conventional agriculture have led many farmers and consumers to seek alternative practices that will make agriculture more sustainable. External input dependent Green Revolution alarm bells have been ringing for a decade or more. The soils of India are dying, the agriculture is becoming increasingly destabilized and farmer's suicides are mounting throughout the length & width of the country. The World Food Summit in 1996 provided a comprehensive definition for food security which brings into focus the linkage between food, nutrition and health. Food and nutrition security (FNS) has evolved dramatically during the last decades in theory and practice. Ensuring health and food and nutrition security is essential for poverty eradication and climate-resilient sustainable development. In the sixties of the last century the acute or chronic food inadequacy at national, regional or household level was widespread among the poor segments of population. Entrepreneurs see a market for selling food that has been grown chemical free. Bio- farming practices rejuvenate natural resources and re-enliven the earth, promote biodiversity so that it could continue supporting a healthy plant and animal life. Biodynamic is an innovative & activated organic farming system that has significant role to play in the areas of sustainable agriculture with emphasis on ecological conservation and renewable resources.

The degenerative effects of intensive farming practices on soil fertility and ecological balance are surfacing which needs immediate attention for sustaining the productivity rate. Increasingly, the movement away from organic methods of farming has resulted in the loss of food, nutritional, livelihood and ecological security and at times, life itself. Many recent reports in the media have written an epitaph for Indian soils, food & nutritional security. When used correctly agro-environment-friendly technology has promoted sustainable agricultural growth and reduced widening rural-urban income disparities. To address these challenges, robust and carefully targeted investment is needed, along with comprehensive policy frameworks at global, regional and national levels.

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