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Promotion of Organic Farming & Eco-friendly Technologies through Rural Institutions

Rajesh Kumar Dubey¹

Director, Prakriti Educational & Research Institute, Lucknow, UP, India¹

ABSTRACT: External input dependent Green Revolution alarm bells have been ringing for a decade or more. The soils & farmers of India are dying, the agriculture is becoming increasingly destabilized and farmer's suicides are mounting from the prosperous Punjab to where not. The path-finding World Agriculture report released by the UN-sponsored International Assessment of Agricultural Knowledge, Science and Technology to development (IAAKSTD/ IAASTD) in April 2008 has suggested a natural resource management based ecologically sustainable agriculture to mitigate the adverse effects of a nearly 31% contribution to anthropogenic greenhouse gas (GHG) emission by present day industrial agriculture and associated land use changes. Organic farming, in spite of the reduction in crop productivity by 9.2%, provided higher net profit to farmers by 22.0% compared to conventional farming. This was mainly due to the availability of premium price (20–40%) for the certified organic produce and reduction in the cost of cultivation by 11.7%. The effective alternatives like organic farming, non-conventional energy with rural innovations development programmes in association with rural institutions has a promising future of self reliance and sustainability.

I. INTRODUCTION

With increasing concern about the environmental, economic and social impact of chemical –dependent conventional agriculture & modern technology driven development have led many farmers and consumers to seek alternative practices that will make agriculture & rural development more sustainable. According to *Codex Alimentarius* (FAO/WHO)1, '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. Small entrepreneurs, underprivileged, downtrodden, women, unemployed youth and other vulnerable sections of the rural India see a market for selling food that has been grown chemical free, eco-friendly organically.

The degenerative effects of intensive farming practices on soil fertility and ecological balance are surfacing in terms of soil toxicity, climate change, loss of productivity, residual toxicity in food products & supplements, which needs immediate attention for sustaining. Increasingly, the more movement away from organic methods of farming has resulted in the loss of food, nutritional, livelihood and ecological security and at times, life itself. The concept of organic farming in India dates back to 10,000 years and it finds its reference in many Indian historical books. Agriculture was the main source of livelihood in India and the use of naturally occurring matters for increased productivity, disease resistance and pest control was always in use, since time in memorial. The use of oil cakes, cow dung, neem leaves, etc. is still practiced in India to ward off pests and used as preservatives. The use of chemical fertilizer for increased productivity started from late 1850s. In India, the first use of chemical fertilizer for increased agriculture productivity started from 1906. Many recent reports in the media have written an epitaph for Indian soils, bio-resources like water, air, etc declaring them polluted & deterioration in quality. Eco-friendly rural technologies like organic farming practices, non-conventional energy, herbal cultivation & processing etc with a micro-planning & backup support of science & technology for societal development can be highly instrumental to socio-economic development and sustainability. The rich plethora of traditional wisdom & indigenous knowledge can be duly

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integrated to develop appropriate modern technologies for the socio-cultural and economic development with eco-friendly silver lines.

II. EMERGENCE

Activated Organic farming system in general & eco-friendly techniques in particular are increasingly improving to the sustainable development practice in many countries as well as in different parts of India. Organic agriculture is now practised in more than 130 countries with a total area of 30.4 million hectares in 0.7 million number of organic farms. This constitutes about 0.65% of total agricultural land of the world (Table 1). Global demand for organic products remains robust, with sales increasing by over US\$ 5 billion a year.

Organic Monitor estimates international sales to have reached US\$ 38.6 billion in 2006, double that of 2000, when sales was at US\$ 18 billion. The growth is three dimensional & inclusive. For a rural BPL population & low-input use zones organic is a tradition and the way of life. Others are those facing ill effect of modern chemical practice like high cost & diminishing return, reduced soil fertility, food toxicity etc. The third category is farmers & entrepreneurs adopting organic system as a system of export promotion & premium commodity market. According to Agricultural and Processed Food Products Export Development Authority (APEDA) 4, a nodal agency involved in promoting Indian organic agriculture, about 585,970 tonnes of organic products worth of Rs 301 million are being exported from India. Growing awareness, increasing market demand, increasing inclination of farmers to go organic and growing institutional support have resulted in more than 200% growth in certified area during the last two years. This reflects organic agriculture as a cost effective and techno-economically viable, export friendly, farm friendly, eco-friendly farming system. Thus is adoptable and sustainable. 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 as well as rural sustenance.

Like organic, 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 biodynamic agriculture and organic farming are similar in that both are ecologically oriented and do not use chemical fertilizers, pesticides and weedicide. The main difference between the two is that in biodynamic agriculture eight different herbal preparations (BD 500-507) 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. 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.

III. HIGH GROWTH RATE

In India Traditional agriculture was almost organic. After independence developed & affluent nations influenced modern agriculture practices leading to green revolution & extension of chemical fertilizers. But now modern organic farming growth is fastest in developed countries like Germany, USA, and Australia etc. The organics growth rate is very high both in developed & developing countries. In under developed once it is major commodity in rural areas. Certified organic farming growth has grown 30 folds in last 5 years in our country. The local demand for organic food is growing. organic farming, in spite of the reduction in crop productivity by 9.2%, provided higher net profit to farmers by 22.0% compared to conventional farming. This was mainly due to the availability of premium price (20–40%) for the certified organic produce and reduction in the cost of cultivation by 11.7%. The statistical details of growth rates year wise are shown in table 1. The organic agriculture which is a consumer –centric commercial agriculture world over with growth rate of almost 25-30% per year during last 10 years. In spite of recession fears the growth rate of organic agriculture is steady & fast.

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Table- 1. Growth rates year wise under Organic Farming

SN	Years	Area of Organic Crops (Ha)
1	2008-2009	12,07,000
2	2007-2008	8,65,000
3	2006-2007	5,38,000
4	2005-2006	1,73,000
5	2004-2005	76,000

IV. FUTURE PROSPECTS

For agriculture sustainability 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. The newer technologies in combination with traditional methods are going to be of great help in this endeavor. The role of Organic Farming in India Rural Economy can be leveraged to mitigate the ever-increasing problem of food security in India. With rapid industrialization of rural states of India, there has been a crunch for farmland. With the exponential population growth of India, the need for food sufficiency has become the need of the hour.

Further the overuse of plant growth inhibitor, pesticides and fertilizers for faster growth of agricultural produce is detrimental to human health and the environment as a whole. The proposition of Organic Farming in India Rural Economy holds good, as an alternative to arrest this problem. Although before green revolution it was organic farming but the introduction of the process of Organic Farming in India Rural Economy is a very new concept. The huge furor over the overuse of harmful pesticides and fertilizers to increase agricultural out put has in fact catalyzed the entry of Organic Farming in India Rural Economy. The process of organic farming involves using of naturally occurring and decomposable matter for growth and disease resistance of different crops. The main advantages of Organic Farming to chemical agriculture in India Rural Economy are as follows -

- Organic fertilizers are eco-friendly, completely safe and do not produces harmful chemical compounds.
- Organic farming generates employment potential, promotes cost & benefit ratio, strengthens bio-prospective and conserves natural resources.
- Organic agriculture address quality, sustainability concerns and ensures a dept free profitable livelihood option.
- Organic products show positive health impacts, increased immunological responses and premium price is the most important from the point of view of livelihood and survival of our small and marginal farmers.
- The consumption of chemical fertilizers in comparison to organic fertilizers is always more, costly, injurious to bio-resources. Moreover, chemical fertilizer needs huge quantities of water to activate its molecule whereas, organic fertilizers does not need such conditions Chemical fertilizers almost always have some harmful effects either on the farm produce or on the environment.

Some important Crisis vs solutions through RIs:

1. The crisis in Indian Agriculture is of utmost seriousness as increase in production and productivity has virtually stopped (last year overall production was -0.2% vis-à-vis the previous year) while population increase is around 2% per year. This can be effectively tackled by organic farming.
2. Global climate change as manifested by slow but steady temperature rise is sure to adversely affect agriculture in the low latitudes. Whereas Organic farming & non-conventional energy and eco-friendly techniques have carbon sequestration properties.
3. The intensification of modern agriculture production has resulted in loss of biodiversity, environmental problems and associated societal costs and negative food quality. Organic farming & eco-friendly techniques mostly backed by RIs
4. The situation would be further exacerbated by weather uncertainties and extremes in the form of prolonged drought, flood, more frequent cyclones and tornadoes damaging coastal ecosystems, agriculture and confined brackish water fisheries in particular via serious damage to river embankments and ingression of salt water.

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5. The path-finding World Agriculture report released by the UN-sponsored International Assessment of Agricultural Knowledge, Science and Technology for development (IAAKSTD/ IAASTD) in April 2008 has suggested a natural resource management based ecologically sustainable agriculture to mitigate the adverse effects of a nearly 31% contribution to anthropogenic greenhouse gas (GHG) emission by present day industrial agriculture and associated land use changes.

Role of Rural Institutions:

- Ever since Gandhian Era Rural institutions, NGOs and other academic and promotional bodies are catering the services of awareness, publicity, demonstration, skill development & capacity building among those who are underprivileged, downtrodden, women, unemployed youth and other vulnerable sections of the rural India.
- Rural Institutions are society driven people participatory institutions working as facilitator to beneficiaries. They have flexibility to device, develop and deliver the needful to the society for skill-oriented indigenous technologies, for the rural population, besides designing action programmes on rural higher education suited to their socio-economic needs.
- The RIs are extension institutions in accordance with the Gandhian philosophy of education, and works as a tool for social and rural development.
- Through peace and conflict resolution, micro planning, youth sensitization programme, NCRI labs and the development of Rural Resource Informatics Centre, focusing on improving agricultural technologies like post-harvest and seed technologies, rural health and sanitation etc.

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BIOGRAPHY



Rajesh Kumar Dubey is M. Tech & Ph.D. (Biotechnology), a nationally reputed biotechnologist & sustainable development facilitator, academician, policy maker & administrator. He worked as Visiting Professor & Director, Centre for Technology Development and Research, (CTDR), JRRS University, Jaipur, Rajasthan India. He has rich & versatile experience of more than 2 decades in the field of science & technology and biotechnology for poverty alleviation and sustainability. Associated with the World Bank supported projects on diversification support & micro-credit action research and demonstrated

technology based societal transformations through knowledge connectivity. His major contributions are with innovations in rural technology for green growth, eco-livelihood and sustainability. Carrying forward with Council of Science & Technology, Organic Missions, Nature based livelihood development programmes, National Agriculture Technology Project (NATP) & Agriculture Technology Management (ATMA) development, clean energy & climate mitigation programmes etc for different national & international development institutions across the globe, Dr. Dubey is winner of more than a dozen national & international citations and awards.