Efficiency of Organic Farming To Maintain The Food Security And Doubling Farmer's Income In India

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Abstract- *India is a country of 1.33 billion people, where food security is a very burning topic discussion. On the world hunger index it is in the 100th position, in such time talking about transformation of Indian an agriculture to organic farming is quite challenging. There is a strong belief in the mind of people that zero budget natural farming technique can no bring the same yield as the conversional inorganic farming. And it is true, the techniques are followed now on the name of organic farming they are too generic and less effective. As a result the special farming is getting a bad name. Where there are some advanced methods of production which can increase the yield and also maintain the soil as well as crop quality. In India every year a huge number of people died due to the effect of pesticides and chemicals, a train is running regularly from Punjub (place of effective so called green revolution) for the cancer patients only. In such condition alternatives should be evolved and bring into action. Keeping all this thing in mind this article was written, which includes and focuses on the basics and some advanced organic approaches. It also talk about some hand on and proved findings of organic farming which bring a tremendous result which can bring the holistic and sustainable second green revolution in India.*

Keywords- Organic farming, India, Liquid manure, Agnihotra, Sustainable agriculture, Zero budget natural farming, Doubling farmer's Income.

I. INTRODUCTION

Organic farming is the special type of farming where farming is done without the use of any inorganic substances. This concept was not new in India, but the concept of the inorganic farming is foreign origin. At the Mughal time a prince of the Royal family named Dara Shikoh eldest son of Shah Jahan introduce the use of inorganic subsistence in the farming. He had hobby of gardening and many plantation crops were present in his garden he used a substance called *nitre* for the growth of the trees which is a pure nitrogen supplement for the plants. The concept of farming was started 10000 years ago in the Vedic age. At that time the chemicals were not there but they can protect their plant, they can grow their food and can feed their people. After independence as well as partition the amount of land divided but the populations of India do not decrease at the same ratio of the land. As a result food scarcities arise. After World War-II the countries who stop their business of weapons they started the business of chemical fertilizer, and they choose the north-eastern Trans Gangetic plain as their place of extension. The HYVP (High Yielding Variety Programme) so called green revolution started. The high yielding variety needs more fertilizer, more water as a result today north-eastern Trans Gangetic plain become an unfertile land.

II. DEFINATION AND INDICATORS

"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises 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/WHO Codex Alimentarius Commission, 1999)

Key data/indicators related to area and producers 2015

- 179 countries have data on organic agriculture.
- 50.9 million hectares of agricultural land are organic (including conversion areas).
- In 11 countries 10 percent or more of the farmland is organic
- 2.4 million Producers were reported, more than three quarters are in developing countries(Source: orgprints.org)

Organic Certification

Organic Certification Organic Certification is a process for producers of organic food and other organic agricultural products. In general, any business directly involved in food production can be certified, including seed

suppliers, farmers, food processors, retailers and restaurants. It generally involve a set of production standards for growing, storage, processing, packaging and shipping that include:

- Avoidance of synthetic chemical inputs (e.g. Fertilizer, pesticides, antibiotics, food additives, etc) and genetically modified organisms;
- Use of farmland that has been free from chemicals for a number of years (often, three or more);
- Keeping detailed written production and sales records (audit trail);
- Maintaining strict physical separation of organic products from non-certified products;
- Undergoing periodic on-site inspections.

It is intended to assure quality and prevent fraud. For organic producers, certification identifies suppliers of products approved for use in certified operations. For consumers, "certified organic" serves as a product assurance. (*Source: icfa.org.in**)***

III. RESULTS AND DISCUSSION

After 1000 years of slavery under different rulers we forget that our sages also doing farming, once India was well known for its farm products like spices fruits *etc*. The rulers put their view on agriculture in our brains and we forget our own technologies. From the age of *Rig Veda*, we started farming. *Rig Veda* the oldest composition has several verses describing the profession of farming. For example, book 10, chapter 34 and verse 13 of *Rig Veda* contains the divine message about agriculture. *Atharva Veda* contains the science of *Agnihotra* (the basic Homa) which is the backbone of the Homa farming. There are such other books only describe the farming written by our great sages like *Krishi Parasara* of the sage *Parasara* (c.400BC); *Kashapiya Krishisukti* of sage *Kashapiya* (c.800BC); *Brihatsamhita* of *Barahamihir* (600 AD); *Vrikshayurveda* by *Surpala* (c.1000AD) *etc.* where we can know about different liquid manures with different natural ingredient which can increase the crop yields and preserve the health. Our point is not to demonstrate the supremely of organic farming over chemical farming or conventional agriculture. Our aim is that simply to investigate whether organic agriculture can.make enough food to feed the India's population or not. Advance in agricultural science technology in 1940s happened, is now known as Green Revolution. Chemical fertilizers and pesticides, irrigation technology, hybridization and modern farm machinery giving doubled and sometimes tripled yield, achieving food security for a large number of population. But these advance techniques have comes under serious question because of concerns over environmental deterioration and detrimental health effects. With an expected population of 10 billion by the year 2050, the question is that how to feed sustainability such multitude of population without destroying the Environment and Earth has emerged as one of the most important issue of our time.But the growing population density in the country is the big challenge to Indian organic farming. Because through the inorganic chemicals the land is already decorated and lost its own individual fertility. To rejuvenate its fertility again it takes at least three years, but the production in this three years goes so low that another famine come and destroy the whole economy of the country. It is recorded that organic farmers have been found to have a product yield of 20 % not as much as the conventional farming. Scarcely any different investigations propose that this yield might be as low as 50 % of total cultivation. India had additionally seen a decrease in organic farming from the financial year 2011 to 2014 from 3.8 million tons to 1.24 million tons individually. In such a circumstance, the past three years have observed a further drop in production that was around 70 %. About 90 % of the item got from organic farming is either not export or isn't thought to be of a good quality suggested crop protection chemical residues coordination (DAC). A surprising finding is that no actual data of organic agrarian production is available with the ministry of agriculture (commodity wise data is unavailable) neither such data is given by any state government. If we take Sikkim as an organic state, for example, Sikkim's productivity per hectare is five tons per hectare for vegetables. The population of Sikkim has been on the rise it has gone up to 50 per cent in two decades with fall in food grain production of about 30 per cent (FAO, United Nations and TSR). This creates a doubt for other Indian states to adopt a well marketed Sikkim organic model, as it may lead to a food crisis in the Nation.But the model of organic farming they follow us a very slow working. According to them the organic farming is only the solid manures application, but organic manure is a holistic approach of balancing the soil microbial environment along with the plant nutrients. The basic of organic farming is providing the plant nutrient through increasing microbial population in the soil. The solid manures what are used in the field are very slow nutrient relishing in nature. They take atleast 3 month to be available for the plants but the life cycle of the plants don't wait for the manures to rely the nutrients. As a result when the plants need more nutrients they don't get it so the yield decreases. By using the liquid manures not only we can reach to the production of conversional farming nut also cross it. In some research papers it shows that the organic liquid manures are shows better results. Latha (2013) said in the paper three sprays of 3 % *panchagavya* recorded significantly higher pod and haulm yield of groundnut (2335 & 3412 kg ha-1, respectively) as compared to other treatments which was evidenced by higher total dry mater accumulation (51.07 g

plant-1) and taller plants (46.97 cm) along with number of pods plant-1 (47.17) and kernel yield (1775 kg ha-1).Kumar *et al.* (2011) shows in their paper that the results of the experiment revealed that foliar application of Panchagavya recorded significant improvement in chlorophyll contentN content of root nodules, plant height, number of branches per plant, leaf area index (LAI) and dry matter production when compared with NPK and control. Yield attributes such as number of pods per plant, number of seeds per pod, test weight and grain yield were also recorded significantly higher under foliar application of Panchagavya over NPK and control. Three percent Panchagavya foliar spray given at 15^{th}, 25^{th}, 35^{th} and 45^{th}days of interval period recorded significantly higher growth and yield of Blackgram than NPK and untreated control. As per Tripathy (2018) a kitchen garden in each house of (5×4) m^2 can easily meet the need of vegetables of a family of four members. Where the sustainability come into action. A family which can grow its own deli need of greens then why it will take the poisonous things from market. The paper also describe the about different organic formulations for pest control, according to Tripathy (2018) 2 per cent neem oil or 10 per cent garlic solution with a cold water is highly effective against the Aphids which regularly disturb the crop growth in the kitchen gardens. According to Tripathy and Dutta (2019) there is an advanced organic technology called *Agnihotra* which is basically a type of *Yaja*or *Homa* which perufy the atmoshpere and increse the nitruent taking ability og plant. Into their research it was found that an yield of 72.37 t ha^{-1} of brinjal can be achieved by this special type of practice (*Enriched Sanjeevani* (1%) + Homa Induction /*Agnihotra*) where it is only 25.61 for the only application of *Enriched Sanjeevani* (1%). Not only that, it also increase the qualitative value of the crop. Other than that through this practice a benefit cost ratio of 6.78 can be achieved in brijal cultivation through a commercial and mass cultivation. So the productivity cannot be a hurdle in the case of organic farming. It can achieve the adequate and quality production.

IV. GOVERNMENT ACTION FOR PROMOTION OF ORGANIC FARMING

Paramparagat Krishi Vikas Yojana

Paramparagat Krishi Vikas Yojana" is an elaborated component of Soil Health Management (SHM) of major project National Mission of Sustainable Agriculture (NMSA). Under PKVY Organic farming is promoted through adoption of organic village by cluster approach and PGS certification.

The Scheme envisages:

- Promotion of commercial organic production through certified organic farming.
- The produce will be pesticide residue free and will contribute to improve the health of consumer.
- It will raise farmer's income and create potential market for traders.
- It will motivate the farmers for natural resource mobilization for input production.

Program implementation

- Groups of farmers would be motivated to take up organic farming under Paramparagat Krishi Vikas Yojana (PKVY).
- Fifty or more farmers will form a cluster having 50 acre land to take up the organic farming under the scheme. In this way during three years 10,000 clusters will be formed covering 5.0 lakh acre area under organic farming.
- There will be no liability on the farmers for expenditure on certification.
- Every farmer will be provided Rs. 20,000 per acre in three years for seed to harvesting of crops and to transport produce to the market.
- Organic farming will be promoted by using traditional resources and the organic products will be linked with the market and certification.

V. CONCLUSION AND FUTURE SCOPE

Now the situation is everyone is understanding, but anyone is not willing to change. The active concept seeding was done during the green revolution of 1960s can be done again for th organic farming. The Government and the NGOs have to join their hands to achive the food security through organic farming. Through the funding of Government and the human resources of the NGO that bench mark can be achived. It is true that the initial years while converting the land from inorganic to organic the production will be reduced. So rather than to achive the goal in a one shot we have to do it very slowly and effectively. The famer clusters shouldbe formed and every year a little amount of land shuld be converted into organic to inorganic. May be 10% of the land each year. Other wise it creates a huge food insecurity in the initial years and we can not do any experiment whith the food security. The officials who do the planning of the second holistic and sustainable green revelution must take into account the indegenous knowledges of vaidic agriculture what should be amalgamet with the modern intervention to bring the best result. The liquid manures like *Sashyagavya, Panchagavya, Kunapajala, Amritjal, Sanjivani* should be (Figure: 1) take in to the consideration because they are high nutrient and fast

releasing manures it may reduce the gap of the inorganic fertilizers.It is a slow but must be stady process. So organic farming can feed India through the holistic approach by uniting the Government and NGOs.

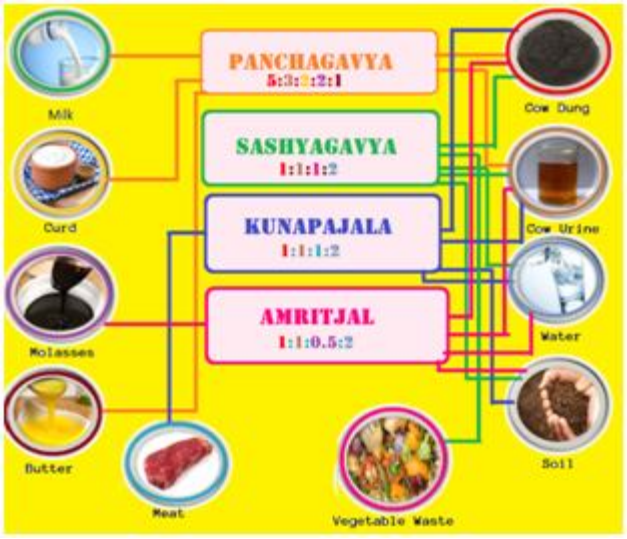

Figure 1 Different Organic Liquide Manures and their formulas

REFERENCES

[1] Tripathy, S., and Dutta, A. K. (2019). Effect of enriched Sanjeevani and Agnihotra on growth, yield and quality of brinjal (Solanum melongena L.). *Journal of Phytology*, 42-46.

[2] Tripathy, S (2018). An Experiment on Kitchen Garden through Organic Farming Approach. *International Journal of Research in Engineering, Science and Management*, 1(9), 287-290

[3] Willer, H., Lernoud, J., Huber, B., & Sahota, A. (2017). The World of Organic Agriculture (Session at the BIOFACH 2017).

[4] Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M. J., Aviles-Vazquez, K. and Perfecto, I. (2007). Organic agriculture and the global food supply. *Renewable agriculture and food systems*, *22*(2), 86-108.

[5] H S, Latha (2013). *Development of organic production techniques for Groundnut-Onion sequence cropping system* (Doctoral dissertation, University of Agricultural Sciences, Bengaluru).

[6] Organic Farming - Indian Chamber of Food and Agriculture. (http:///assets/doc/reports/Organic_Farming.pdf)

[7] Paramparagat Krishi Vikas Yojana — Vikaspedia. (http://vikaspedia.in/agriculture/policies-and-schemes/crops-related/krishi-unnati-yojana/paramparagat-krishi-vikas-yojana)

[8] What is organic agriculture? - FAO (http://www.fao.org/organicag/oa-faq/oa-faq1/en/)

[9] Indian Chamber of Food and Agriculture (https://icfa.org.in/)

[10] Kumar, R. S., Ganesh, P., Tharmaraj, K. and Saranraj, P. (2011). Growth and development of blackgram (Vigna mungo) under foliar application of Panchagavya as organic source of nutrient. *Current Botany*.

[11] Miller, H. (2010). Can Organic Farming Feed the World. *Perspectives on a Food Movement's Place in World Food Security. HOHONU*, *8*, 35-38.