Organic Farming and It's Environmental Implications in Palghar District.

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Abstract: Abundant use of fertilisers, insecticides, pesticides, HYV seeds etc help to increase agricultural productivity to support huge number of people in India. But while using huge amount of chemical fertiliser the quality of ground water, nutrient level of soil degrading very fast in our country. To improve the quality of soil, ground water and overall agricultural environment; organic farming can be a better option. Government of Maharashtra has formulated special policy for encouraging organic farming in Maharashtra. The policy has suggested a path for developing the organic value chain from, farm gate to the consumer. Organic farming get special mentioned in the holistic approach of the Govt's agricultural draft policy. It emphasizes how organic farming would restore soil quality, which is affected due to utilization of chemical fertilizer. Palghar is the 36th district of Maharashtra, is having an extra advantage of proximity to Mumbai. It gives a boost to the farmer to practice organic farming and sell their organic product directly to the nearby market as well as other parts of the country. Hence practicing of organic farming in Palghar district will help to maintain environmental sustainability

Key words: organic farming, environment, sustainability.

Introduction

The concept of organic farming is not a new concept in India. It has been practiced since ancient times in India. The main aim of the organic farming is to help soil stay in good health through the use of organic waste, biological waste, bio fertilizers, bio pesticides etc. Therefore organic farming is a holistic management system which promotes and improves the health of agro system related to biodiversity, nutrient bio-cycle and bio-chemical activities. It also includes substantial amount of usage of organic manures and green manures. The optimum growth of a plant in a farm, is depend on balanced use of plant nutrients. The requirements of balanced nutrient for growth of plant, cannot be fulfil by the usage of chemical fertilizer alone, but more of we need to use different methods of organic recycling and large scale use of renewable organic resources. Hence organic farming is a better option for protecting environment.

Objectives of the study

The study is proposes with the following objectives:

1. Estimate the awareness of organic farming amongst the farming community
2. Assess the environmental impact of shifting to organic farming

Methodology:

The study is done with a combination of secondary and primary research. The success stories of organic farming and analysis of environmental impact is collected using secondary sources. While, the assessment of awareness of organic farming, required approvals and certifications, cost involved etc. are assessed based on primary research.

The primary research are conducted in the Palghar district, Maharshtra. The reason for choosing the districts is its proximity to Mumbai, and the major market for organic fruits and vegetables. The primary study is

conducted with respondents from the farming sector, and few marketing agencies etc. Primary survey has been done through a questionnaire and with the help of discussion method.

Data collected from secondary sources are analysed using MS excel to establish the overall agricultural scenario in Palghar district. Primary information collected from farmers is analysed to know exact procedure to do organic farming and how it is beneficial for the environment. Information collected through primary survey also helps to get an idea about which kind of problems farmers are facing to practice organic farming.

Concept of Organic Farming:

The concept of organic farming differ among the people. According to some people conventional agriculture, sustainable agriculture Jaivik Krishi all are organic farming. Many people think that usage of organic manures rather than chemical fertiliser is known as organic farming. But actually, organic farming is a comprehensive management of agricultural farm. It starts with seed, seed bed, ploughing, sowing, manures, harvesting everything should be organic way.

According to USDA "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".

According to FAO "Organic agriculture 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 philosophical terms organic farming means 'Farming in spirits of organic relationship. Hence, organic farming means placing farming on integral relationship, between the soil, water and plants, between soil-soil microbes and waste products, between the vegetable kingdom and the animal kingdom of which the apex animal is the human being. The totality of these relationships that is the bed rock of organic farming'. (NCOF, Govt. of India)

Profile of Palghar District

Palghar is the 36th new district of Maharashtra which came into existence from 1st August 2014. Palghar district starts from Dahanu at the north and ends at Naigaon. The district is bounded by Thane and Nashik Districts on the east and northeast, and by Valsad district of Gujarat state and Union Territory of Dadra and Nagar Haveli on the north. (Map:1) The Arabian Sea forms the western boundary, while Vasai-Virar is part of Mumbai Metropolitan Region. According to the Census of 2011, the total population of Palghar District is 29,90,116. The district has a total of 8 talukas, namely- Jawhar, Mokhada, Talasari, Vasai, Vikramgad, Palghar, Dahanu and Wada. Palghar District has 4,69,699 hectares of the total geographical area, with 1008 villages and 3818 sub-villages as well as 477 gram panchayats. The literacy rate of the district is 66.65% ,male literacy percentage is 72.23% and female literacy percentage is 59.28%.. The district headquarters is at Palghar taluka and are connected to other talukas by roads and railways.

The average rainfall of the district is about 2458mm. The main river flowing through the district is the Vaitarna. The river has many tributaries; the most important of them are Barvi and Bhatsa, Pinjal, Surya, Daherja and Tansa. Vaitarna River is the longest in the Konkan region,s is 154 km long and has a drainage area that practically covers the entire northern part of the district.

Map:1 Palghar District Map with Tehsils

Source: https://www.mapsofindia.com/maps/maharashtra/tehsil/palghar.html

Agriculture in Palghar and Raigad District

Agriculture is one of the main activity in Palghar district with industrial activity. Farmers of the Palghar district cultivate mainly in three different seasons kharif, rabi and summer season. Among the kharif cereals, farmers cultivate kharif rice, jowar, bajra, ragi kharif maize are important. In kharif pulses they cultivate tur, mung, urad etc. Gram and few other pulses are main crops among rabi crops.(Table: 1) In summer season they mainly cultivate summer rice. Irrigation is main problem during this season. Moreover, the farmers of the district cultivate varieties of fruits and vegetables.

Table:1 Area, Production & Productivity in Principal Kharif and Ravi Crops, 2013-14

Seasons and Crops	Area	Production	Yield
Total Kh Cereals	960	2381	2481
Total Kh Pulses	63	50	788
Total Kh Oilseed	18	6	335
Total Rabi Cereals	1	1	2097
Total Rabi Pulses	52	41	788
Total Rabi oil seeds	6	2	369

Area in '00' hac, Production in '00' tonnes and Productivity in kg/hac

Source: www.krishi.maharashtra.gov.in

Major Components of Organic Farming in Palghar District

Researcher visited the G.E.S's Krishi Vigyan Kendra, Kosbad, Dahanu, Palghar to collect information about organic farming in Palghar District and collected information that around 15% to 20% farmers of the district

are practicing organic farming in the district and good number of farmers are attending training to learn about the details of the cultivation. According to the KVK, organic farming should start from seed and then; ploughing, seed bed, seed treatment, manure, cultivation, harvesting and up to the marketing everything should be in local way.

Farming should start with local variety of seeds. In case of rice, around 25 varieties are there like shruti kolam, wada kolam, kale kharsi (Red rice) etc. In case the farmers of the district, do not get local variety then use straight variety. For seed treatment they use neem, beejamrut etc. To provide fertiliser in the farm they use gobar, do composting, vermicomposting, use excreta of poultry, goat, sheep etc. As a green manure farmer can use dry leaves and branches, skin of green gram, black gram etc. They also prepare jeevamrut for soil nutrition. While farming many insects attack in the crops or fruits to reduce that farmer uses neem cake, neem oil, different insect trap etc. Then finally farmer can do crop harvesting, and agin crop residue become manure for the next season of crop.

To practice organic farming some components are very important like crop rotation, crop combination, maintenance of soil fertility through biological nitrogen fixation, organic manure crop residues, and use of soil microorganisms, , bio-pesticide, biogas slurry, waste etc. Vermicomposting has become a major component in organic farming, which helps in enhancing the soil fertility and indirectly provides good quality of crops. Following are essential component of organic farming:

A. Mixed Farming:

Organic Agriculture depends on appropriate diversification, which means mixed farming or integration of crop and livestock production on the farm. In this way agro ecosystem can be optimised in a farm. Crop residues can be used for animal husbandry and manure for crop production.

B. Crop rotation:

It is a systematic arrangement for the growing of different crops in a more or less regular sequence on the same land covering a period of two years or more. The selection of optimal crop rotation is important for successful sustainable agriculture. Crop rotation is very important for soil fertility management, other important advantages such as weed suppression, reduction in soil borne insect pastes and diseases . Legumes play very important role in crop rotation and it should be cover 30 to 50 percent of the land. A mixed farming, is essential for organic farming.

C. Crop Residue:

The utilization of crop residue has a great potential for organic farming. Farmers get crop residue from some of the major cereals and pulses. Approximately 50% of the crop residues are utilized as animal fed, the rest could be utilized for recycling of nutrients.

D. Organic Manure:

The organic manure is derived from biological sources like plant, animal and birds residues. Organic manure helps in many ways to increase the crop growth and maintain soil productivity. Bulky organic manure generally contains fewer amounts of plant nutrients as compared to concentrated organic manure like compost and green manure. Concentrated organic manures are those materials that are organic in nature and contain higher percentage of essential plant nutrients such as nitrogen, phosphorous and potash, as compared to bulky organic manures. These manures are made from raw materials of animal or plant origin.

E. Vermicompost:

Vermicompost is a major component of organic manure. It is a mixture of worm casting, organic material, humus, living earth worms etc. It is a method of making compost with the use of earthworms that generally live in soil, and eat biomass and excrete it in digested form. It is generally estimated that above 1500 worms which is an ideal population for one sq. meter which can feed on 80 tons of humus per year. These are rich in macro and micronutrients, vitamins, growth hormones and immobilized microflora. Plants get proper nutrients due to the application of vermicomposting.

To do vermicomposting a tank of 4 x l x l m need to prepare with brick line in a shaded place. People uses boxes made up of wooden or card board of various sizes to do vermicomposting. The bottom of the tank is made up of pieces of brick, stone chips, coconut fibre and sand. This will facilitate easy drainage of water. Soil is spread over this to a thickness about 15cm. About 4-5 kg of diluted dung may also be applied. Locally available worm species are placed over the vermi bed. It should be moisture without flooding. A few centimetres of layers of straw, leaves of plants, etc. are spread over this layer. This can be continued till the bed is completely filled. Then liquid cow dung is then applied and bigger leaves are used to cover the contents in the tanks and finally the tank is fully covered with a gunny cloth. Watering the tank is very important nutrient sources in building up the soil fertility.

F. Jeevamruth:

10 kgs of cow dung, 10 liters of cow urine, jaggary 2 kgs, 2kgs of pulse grain flour and 1 kg of soil from the farm, need to mix together in 200 liters of water. The mixture needs to stir twice or thrice a day. After seven days the mixture needs to use it in one acre of land with irrigation water.

G. Beejamruth:

It's a mixture of cow dung (5kg), cow urine (50kg), hand full of soil (200gm) and lime. All need to mix together with 50 liters of water then need to use with irrigation water. Beejamruth is helpful for plant growth and protects the crop from harmful soil borne pathogens.

H. Amritpani:

To prepare amritpani 10 kg of cow dung and 500 gms of honey need to mix thoroughly to get a smooth paste. Then add 200 gms of deshi ghee in the mixture and dilute it with 200 litres of water. This mixture can apply in one acare of land or with irrigation water.

I. Dashparni Ark:

Ten types of leaves in equal quantity Neem, Alovera, jhendu, Tulsi, Papaya, Tantani, Jatropha, Karanja, Custard apple and Limda each of 2kgs needs to mix with 2kgs of cow dung and 5 liters of urine. All these mixtures needs to put it in 150 litres of water and keep it or 5 to 7 days. Then to add around 10 litres of water and after 30 days dashparni ark ready for spray purpose.

Except the above components many farms farmers are using panchgavya, dashyagavya etc they can use in the farms to get healthy crops or fruits. While visiting KVK, Palghar, Researcher get an idea that around 10% to 15% farmers in the district are cultivating crops in organic way. Researcher visited few farms in Palghar district to assess the awareness of organic farming and usage of organic components. Following are the farm visit report.

Farm: 1

Samarth Krupa organic farm spread over 16 acres of land, located in Parghar district. Researcher has visited the farm and met the owner of the farm. After observing and realizing the impact of chemical fertilizer on environment and health, the owner decided to shift from conventional to organic farming. Five members of the family are engaged in farming. In the farm they are having around 700 coconut trees, 200 chikoo plants, 1000 banana plants and other fruit plants like guava, pomegranate etc. Around 4 acres of land they cultivate for paddy. From November to March they mainly cultivate vegetables. All farming work is done by organically. There are 60 goats, 30 buffalow's and cows and hens are there in the farm. The dark organic material in soils, produced by the decomposition of vegetable or animal matter essential to the fertility of the earth. In organic farm farmers need not to spend money for fertilizer. They collect gobar from the farm and vermicomposting is done and they use it as a fertilizer. From the urine of cow's they prepare jeevamrutha, and spray it in the plant. Jeevamrutha is having higher number of beneficial microorganism. The presence of beneficial microorganisms in these liquid formulation might be mainly due to their constituents such as: cow dung, cow urine, legume flour and jaggery containing both macro and essential micro nutrients.

In the farm, farmer used organic fertilizer and organic pesticides once in a year in the fruit plants whereas for vegetables they use frequently. In the fruit plats they put liquid fertiliser in in circling the plants, in the second year they increase the circle and third year they increase further more the circle and put the fertiliser. Every three year they start the same fertilizer pattern. Hence all the roots of the plants can get proper food. Every year the farm do soil testing in Palghar soil testing office.

Water plays very important role for farming. The farmer face the water scarcity during the summer season. They have created small pond within the farm. During the rainy seasons they store water in the pond. They use some amount of water for farming directly and rest of the water seeps slowly to the ground, which helps the soil to become moist for next few months. Then farming become easy. Moreover they are having 18 borewell, out of that 5 are properly functioning and rest of the borewell they do not get water. According to the owner of the farm 10%-15% farmers of Palghar are practicing organic farming.

Farm-2

Researcher has visited 'Sanjiwani Farm' in Chimbawe village, Dahanu, Palghar and met the owner (National Award Winner in Agriculture) of the farm. The farm which is 100% organic farm, spread over 18 acares of land. He is a certified organic farmer. The main plants of the farm is chikoo. The farmer is having around 400 chikoo plants. The production in his farm is 200kg/year. The farmer does vermicomposting in the farm. He is having few cows inside the farm. Two special varieties of Gir Cow he is having, which is a local variety of cow and good for organic farming. The speciality of the cow is, they are having very long pendulous ears which is very good fly and insect swatter. They also have well marbled big hump on their back.

The farmer does vermicomposting with in the farm. He prepares jeevamrut and dashaparnika and used it as a fertilizer and pesticides and spray it to the plants. To prepare jeevamrut he takes 200 litres of water, mix it with 10 litres of gomutra, 1 kg of besan and I kg of gud. Then keeps it in shaded place. Every day 3 times need to stir it and after 7days he utilizes it in the plant. To dilute the spray he takes 5 litres of jeevamrut with 20 liters of water, mix it and then spray it to the plant.

The farmer also prepares dashaparni ark in the farm which is very good for plant as well as protect pant from insect. To prepare dashaparni ark, he takes 5 kg leaves of each of the plant like Alovera, Jhendu, jatropha, custard apple, karanja, limda, kaduneem, tantani, papaya and tulsi and mix it in 200 litres of water with cow urine then keep it for 5 to 7 days and then can spray it.

Availability of water for irrigation purpose is a problem in Dahanu area. Inside the farm farmer is having a pond. He stores water in the pond during rainy season after that water seeps through the soil and soil became moist for cultivation. There are 5 borewell in the farm but during summer season very difficult to get water. Due to the proximity of sea sometimes saline water also comes through the borewell which cannot be utilized in the farm.

According to him though his farm is 100% organic but faces many problems. Dust particles from Dahanu Power Plant is having impact on the production of chikoo, sometimes to get labours a problem. As the Arabian sea nearby, so some time saline water encroaches through bore well.

Environmental Implications of Organic Farming:

The fact of environmental benefits of organic farming is worldwide accepted. Components of organic farming shows that the steps of cultivation of organic farming is environmental friendly. Certain benefits of organic farming are easily visible and to understand certain benefit it take few years. But it is proved throughout the world that organic way cultivation of farming helps to maintain environmental sustainability.

Organic farming helps to maintain the quality of soil. It is possible due to the minimum tillage and no utilization of chemical fertilizer. It also helps to store more carbon in the soil. Studies showed that the presence of organic carbon higher in the soil, due to the practice of organic farming, organic carbon increases plant growth and promotes biological and physical health of the soil. Moreover organic farming reduces water pollution. It is well known that when irrigated water mixes with chemical fertiliser and seeps through soil then ground water gets polluted. But in case of organic farming, where farmers mainly use compost, green manure, amrutpani, dsahparni ark which are completely chemical free. Hence, no chance to the pollute of ground water or any other water sources.

In organic farming farmers predominantly use green manure. So in organic farming usage of energy is very less but in non-organic farming to produce chemical fertiliser requires huge amount of energy. The mechanism of organic agriculture improves agro ecosystem with in the field which is important for agricultural production and conservation of nature.

Conclusion

Organic farming has its own social, economic, environmental and ethical relevance but in practical farmers are facing many problems in the district. As the organic manure are quite bulky and biological control of insect, pest and weeds quite often occur in crop and pasture land, it is difficult to starts organic farming fully in in a district. Moreover knowing the socio-economic status of majority of our farming community in India, it would be appreciate to use organic farming largely in a combination with the existing system presently. But with the help of scientific planning, smart strategy, government planning, training and guidance to farmers and extension workers the organic farming will make its unique position in the district's agriculture and will maintain environmental sustainability.

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