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Commercial and Economic Evaluation of Organic and Bio-Fertilizer Usage among Farmers in Nagpur Division

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Abstract

The study involves to see the commercial and economical implication of farmers in using organic and bio-fertilizer in Nagpur Division. This study is conducted to analyze the awareness, farmers adoption pattern, marketing practices, cost effectiveness and economic benefit of the use of organic and bio-fertilizer for the farming activities. The study also examines the impact of these fertilizers on the productivity of crops, soil fertility and sustainable agriculture practices. Structured questionnaires and interviews of farmers were conducted in selected districts of Nagpur Division to gather primary data and government reports, agricultural journals and related literature were used to gather secondary data. The results suggest that the incorporation of organic and bio-fertilizers has had a beneficial impact on farmers' income, minimized reliance on chemical fertilizers, and enhanced environmental sustainability. But there are still other issues of low awareness, high start-up, and poor marketing support which limit the wider application among farmers in the area.

Keywords: Organic Fertilizers, Bio-Fertilizers, Agricultural Marketing, Economic Impact, Sustainable Agriculture, Farmers' Income, Soil Fertility, Green Farming, Crop Productivity, Nagpur Division, Rural Economy, Agricultural Development

Introduction

Therefore, agriculture plays a significant role in the economy of India for two reasons: job getters, food security, and because it provides raw materials for a variety of other industries. Many farmers and indeed agricultural policy makers over the last few years have become conscious of soil erosion, loss of productivity of agriculture, environmental pollution and over-usage of chemically fertilizers, and have begun to promote sustainable agricultural practices. The emphasize on environmentally sustainable soil fertility and sustainable farming practices has made enhanced soil fertility and productivity via organic and bio-fertilizers an important alternative to the use of chemical fertilisers. Organic fertilizers are materials that come from natural sources, plant and animal excrement, compost material, green manure and other natural materials; A Microorganisms which has the ability to overcome nutrient deficiency at the same time promote the health of the soil. Bio-fertilizers. These fertilizers not only have a lower environmental impact, but can also be utilized in the furtherance of agricultural sustainability.

Pressures of government support price schemes coupled with the rising demand for organic agriculture produce by the market, coupled with an increasing awareness among farmers in agriculture areas sensitizing them to sustainable agriculture approaches is leading to an organic

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and bio-fertilizers use of moderate magnitude. Application of organic & bio-fertilizers improves the soil properties, water holding capacity, microbial activities/increase in crop yield, along with the lesser use of chemical fertilizer. In addition, the adoption of these fertilizers has created additional market opportunities for fertilizer manufacturers, fertiliser distributors and retailers, as well as for agricultural service providers in the fertiliser sector.

Organic and bio fertilizers are emerging as a new market in agro sector because government and NGOs are creating awareness materials, providing trainings and subsidy to the farmers and rural marketing channels and makes the organic and bio fertilizers popular in the society. Notwithstanding these benefits, there are a number of hurdles to the broad scale use and successful marketing of organic and bio-fertilizers. A large portion of farmers' knowledge regarding the correct use, benefit, storage and application is poor. The availability of their products in rural markets, high transportation fees, technical guidance, as well as product quality inconsistencies are also factors which affect their commercial success. Moreover, some of the farmers don't wish to give up all the chemical fertilisers because of uncertainty about the market and immediate yield.

It is claimed that farmers' critical reflections on the commercial and economic implications associated with use of the organic fertilizer and bio-fertilizer product is essential. In this present study the economic benefits of the use of the Organic and Bio-Fertilisers, marketing practices, farmer's awareness with respect to its use and adoption and successive problems are focused. In this study an attempt is also made at analyzing the effect of these fertilisers on the cost of agricultural production, agricultural crops and on the environmental sustainability aspect. For the policy maker/administration, it is important to understand the commercial viability and economic implications of the use of organic and bio-fertilizer so as to have an effective plan to implement sustainable agriculture. The research results from this study can assist in the improvement of the fertilizer marketing system, awareness creation of farmers and motivating sustainable agricultural practices in the study area. Consequently, the study produced insightful role of organic and bio-fertilizers as input into sustainable farming and the capacity of use of such an input in sustaining the farming economy by balancing the economic development and environment protection.

Literature Review

The marketing, efficiency and economic impacts of organic and bio-fertilizers in agriculture are areas of research with numerous activities. Results of these studies can be used as a reference in regard to use of sustainable agricultural inputs to increase the productivity of crops and to lower the cost of crop production and sustainable agriculture as a whole.

Amit Babanrao Kanade (2000) did the study on the marketing of Plantozyme liquid bio-fertilizer in Pune district under the department of Agricultural Economics, Mahatma Phule Krishi Vidyapeeth, Rahuri. The study has focused on the marketing channels, awareness of

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farmers, promotion activities and adoption of liquid bio-fortifier by the farmers. Marketing strategies were found to be a significant factor influencing farmers' acceptance as well as the success of the bio-fertilizer practice in the study area, along with the efforts made to educate the farmers.

S. M. Berad (1996) during his M.Sc. (Agri) work studied the application of liquid fertilizer under banana crop using drip irrigation. B. Tech. Graduates of Mahatma Phule Krishi Vidyapeeth, Rahuri. The results indicated that the use of modern irrigation systems and use of liquid fertilizer was advantageous in respect of nutrient efficiency and crop growth and yield performance improvement. The study pointed out the importance of scientific use of fertilizers for the improvement of agricultural output.

In 1986, Boxer and Wensely (Peter J. Boxer and Joseph R.C. Wensley) in their article in the Journal of Management Studies, explained the importance of an 'integrated marketing strategy', that includes the producers, distributors and consumers. Their research work played an important role to realize the importance of marketing co-ordination in providing wider reach, awareness and market sustainability near the agricultural input marketing.

P. K. Ghosh and P. R. Naik, (1999) conducted a study on “Effect of Biozyme on fertilizer use efficiency”. The study published in Fertiliser News revealed that use of bio-fertilizer has a positive effect on the assimilation efficiency of nutrients and their yield through the crop which therefore reduces the need for using chemical fertilizers in their application. In line with the objectives of the study it was confirmed that use of bio-fertilizers in sustainable agriculture is very significant.

Jaykumar Patel, (2012) studied market opportunity and organic pesticide market strategy in vegetables (Navsari and Valsad district). The un-publicized report on the same submitted to Dhirubhai Ambani Institute of Information and Communication Technology highlighted consumer's awareness about the benefits of organic farming and health promoting agricultural produce, as a huge opportunity for organic agricultural inputs.

Kute S.B., Patil B.J. (1994) studied production and marketing technology of biofertilizers of Gujarat State Fertilizers Corporation (GSFC). Their study, published in the Fertilizer News, pointed towards the value of good production systems, distribution and extension for bio-fertilizer use among farmers.

Lalit Kumar Verma (2013) did a study of market share and market potential of bio-fertilizers in Jabalpur district of Madhya Pradesh in reference to Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKV) which was referred to Lalit Kumar Verma (2013) study about bio-fertilizers in Jabalpur district Madhya Pradesh. The study revealed that the awareness of farmers on sustainable agriculture was on the rise as well as their awareness on the support program

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introduced by the government, which ultimately helped them to increase the demand for bio-fertilizers.

B. N. Magar (1987) got a Masters of Science in Agricultural Studies with principal crops restriction constraints with respect to selected areas of Western Maharashtra on an M.Sc. (Agri.) thesis at Mahatma Phule Krishi Vidyapeeth, Rahuri. The study revealed key constraints confronted by farmers such as lack of awareness, financial constraints, especially in rural areas, stock availability and usage problems.

The literature analyzed indicated that organic and bio-fertilizers are viable alternatives that can be useful to improve agricultural production, health and environmental sustainability. But problems in marketing, farmer awareness, distribution and adoption behaviour still hold sway with regard to their commercial success. With this background, the current study tries to critically appraise the effect of incorporating organic and bio-fertilizers on the farmers in Nagpur Division, of the Central province of Simlipal Wildlife sanctuary, India from the economic and commercial aspect.

Objectives of the study

1. To study the usage pattern of organic and bio-fertilizers among farmers in the Nagpur Division.
2. To analyze the commercial and economic impact of organic and bio-fertilizers on farmers' agricultural productivity and income.
3. To identify the challenges and marketing issues associated with the adoption of organic and bio-fertilizers in the Nagpur Division.

Hypothesis:

H_0 (Null Hypothesis): There is no significant relationship between marketing challenges and the adoption of organic and bio-fertilizers among farmers in the Nagpur Division.

H_1 (Alternative Hypothesis): There is a significant relationship between marketing challenges and the adoption of organic and bio-fertilizers among farmers in the Nagpur Division.

Research Methodology

For the above reason the present study was conducted of Analytical and Descriptive type study on the effect of Organic and the Bio-fertilizer on the farmers of Nagpur Division in commercial and economic aspects. The research was utilized both primary and secondary data. In selected districts of Nagpur Division primary data was collected through the use of structured questionnaires and personal interview-discussions with farmers, fertilizer dealers and agricultural experts. Some of questionnaire 'about awareness', 'about utilization' pattern 'about market activities', economic benefits, productivity and problems of bio-fertilizers were included. Secondary data were gathered from research journals, Government reports, agricultural department publications and books and from websites and past studies conducted

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on the subject of organic and bio-fertilizers. In order to select the respondents from the rural agricultural areas, the convenient and purposive sampling technique was used. Data on all these aspects were classified and tabulated, and statistically analyzed using statistics such as percentage analysis, mean analysis and hypothesis testing to draw meaningful conclusions. The main objective of the study is to get an understanding of farmers' adoption behavior, to measure the effectiveness of marketing strategies and to measure economic outcomes of sustainable agriculture (with organic and bio-fertilizers).

Descriptive Statistics

Particulars	Number of Respondents (N)	Mean	Standard Deviation	Minimum Value	Maximum Value
Marketing Challenges Score	200	3.82	0.74	1	5
Adoption of Organic and Bio-Fertilizers	200	3.56	0.81	1	5

Based on the descriptive statistics, it is observed that in Nagpur Division, there are actually large effects of the Farmer marketing challenges on adoption of Organic Fertiliser and bio-fertiliser by farmer. Averaging 3.82 mark obtained on marketing challenges it means that farmers have faced some marketing problems which include low level of product availability, lack of promotional activity, lack of technical information, high cost of transport and lack of knowledge about benefits and process in application of products such as organic and bio-fertilizer in market operations. Similarly, average score of 3.56 for 'adoption' shows that the farmers were starting to adopt sustainable farming methods with some constraints like commercial and operational/business factors also prevailing. The magnitude of the SD, which was 0.74 and 0.81, respectively, reveal a moderate degree of variation in the opinions of farmers in this study, which means their perceptions on these issues were fairly similar. According to the results, Awareness building, support providing from Government and better distribution mechanisms will need to promote values and utilization of organic and bio-fertilizers in the area for promoting better commercialization.

Pearson Correlation Analysis

Variables	Marketing Challenges	Adoption of Organic and Bio-Fertilizers
Marketing Challenges	1	-0.642**
Sig. (2-tailed)	—	0.000
N	200	200
Adoption of Organic and Bio-Fertilizers	-0.642**	1

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Variables	Marketing Challenges	Adoption of Organic and Bio-Fertilizers
Sig. (2-tailed)	0.000	—
N	200	200

Note: Correlation is significant at the 0.01 level (2-tailed).

Negative Pearson correlation is found in both cases in the Nagpur Division, which is statistically significant among the farmers using the organic and bio-fertilizers associated with marketing problem. There's a medium to high negative association between the marketing challenges/farmers use of Oyster/Biofertilizers as indicated by the value of the coefficient of correlation of -0.642. Its significance value is less than 0.05 (the acceptable value of significance), it means the relationship it has is statistically significant, that is, not random variations only. It revealed that the problem areas of the farmers in the utilization of organic and bio-fertilizers for farming were low market access, awareness programs, farmers' promotion, market supplies and long distances they have to travel for running their trucks and less technical guidance. The analysis mentions the need to develop marketing infrastructures, improve marketing channels and farmer awareness and training programmes to promote the use of sustainable agricultural inputs and services in the region.

Overall Conclusion

From the present study " Commercial and economic feasibility of the use of organic and bio-fertilizers amongst farmers of Nagpur Division", role of sustainable farming system in the modern farming system has been brought into light. The Organic and Bio-fertilizers can play significant role in improving the fertility of soil, crop productivity, in reducing dependence on chemical fertilizers and environmentally sustainable agriculture as revealed in the study. Gradually, organic and bio-fertilizers introduction into this Division is raising the awareness among farmers about the long term economic and ecological gains. The study results indicated that these fertilizers were beneficial in terms of agricultural income by decreasing the agricultural input cost and having positive effect in the long-run in soil. Furthermore, promotion and distribution of organic and bio-fertilizers were mentioned as an opportunity to commercialize the same so as to make the agricultural economy of the rural people strong.

The study also shows that there are still some marketing and operational hurdles existing with regard to the use of organic/ bio-fertilizers among farmers. The findings from Pearson correlation analysis revealed that there was a significant negative relationship between marketing problems and utilization of these fertilizers, which means that marketing problems (limited product availability, deficient awareness, inappropriate promotion strategies and marketing, unstable supply chain, deficit in information about buying, and high transportation cost) are negatively influencing farmers to not adopt sustainable fertilizer practices. While many fruit and vegetable producers have a good working knowledge of organic farm practices, they are not yet certain that the somewhat reduced yield of organic production can give them

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the same profit, and are therefore still reluctant to get more organic. Based on findings it could be concluded that the marketing systems which are effective, training programme, government subsidy and better rural distribution systems are crucial to facilitate the adoption and utilization of organic/bio-fertilizers in the region.

The study also attempts to deduce that the organic and bio-fertilizers market potential in Nagpur Division with regard to sustainable agriculture development are brainstormed. There is a scope to augment awareness building and reach the farmers with the products at the right time, through appropriate channels, in addition to promote scientific farming methods that will surely boost farm participation and define sustainable agriculture, environment protection and economic well-being of rural sector. Thus, concerted action of Government, Agricultural Institutions, Agricultural Marketers and Farmers will be needed to encourage effective use and commercialisation of the Organic and Bio-fertilisers in Agriculture.

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