https://doi.org/10.58419/gbs.v10i1.1012402

IMPACT OF SUSTAINABLE FARMING PRACTICES ON REVENUE GENERATION FOR FARMERS IN MADHYA PRADESH, CHHATTISGARH, AND KARNATAKA, INDIA

Dr. Priyanka Khanzode
Assistant Professor, Department of Management, Dayanand Sagar Business School, BENGALURU
priyanka.khanzode@gmail.com

Mrs. Suji Raga Priya
Assistant Professor, Department of Management, Dayanand Sagar Business School, BENGALURU

Abstract

In India, organic cultivation employs natural inputs and methods to enhance soil health, biodiversity, and sustainability. Concerns about the health and environmental effects of conventional agriculture, as well as a desire to improve rural livelihoods and food security, have contributed to the increase in organic cultivation in India in recent years. This study investigates the numerous agricultural practices in India and their revenue-generating potential. Agnihotra Farming is an ancient Vedic agricultural practice that involves performing a specific fire ritual to purify the environment and enhance soil fertility.The research is based on a review of pertinent scholarly literature and government and non-government data sources on Agnihotra farming. This study identifies the predominant types of agriculture in India, which include traditional subsistence agriculture, modern commercial agriculture, and organic agriculture. It also investigates the revenue potential of each type of agriculture, taking into account market demand, government policies, and technological advancements. According to the study, traditional subsistence agriculture, while still prevalent in many regions of India, has limited revenue potential due to its low productivity and lack of market access. In contrast, modern commercial agriculture has a high profit potential, but is frequently associated with environmental degradation and social inequality. Organic farming, which is gaining popularity in India, provides a compromise by offering greater revenue potential than traditional subsistence farming while also promoting environmental sustainability and social equity.

Key words: Agriculture, Organic farming, Agnihotra Farming, Environment, Sustainability etc.

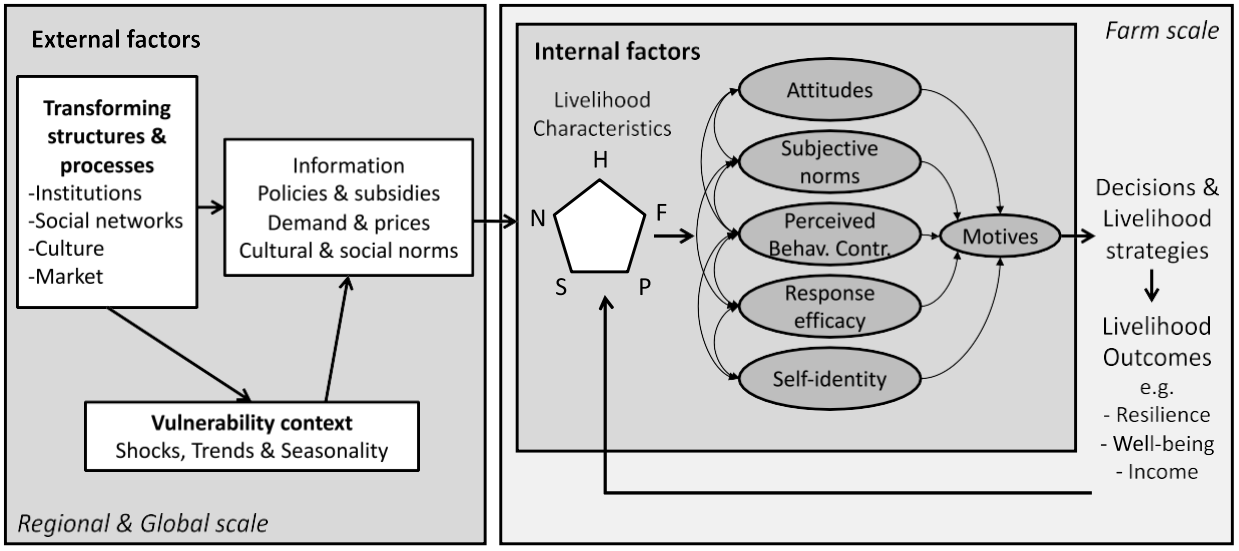
1. INTRODUCTION

Agriculture originated in India during the Indus Valley Civilization. India is the second-largest agricultural producer in the globe. In 2018, agriculture employed more than fifty percent of India's labour force and produced 17–18 percent of the nation's gross domestic product. In 2016, agriculture and affiliated industries such as animal husbandry, forestry, and fisheries contributed 15.4 percent to the nation's gross domestic product and employed 41.49 percent of the labour force. Following the United States and China, India has the largest net cropped area

in the globe. Agriculture's contribution to India's GDP has been declining in tandem with the country's overall economic development. Agriculture, on the other hand, is India's most populous economic sector and an essential component of the nation's socioeconomic structure. Between March and June of 2020, exports of agricultural commodities totaled $3.50 billion. In 2013, India was the seventh largest exporter of agricultural products and the sixth largest net exporter of agricultural commodities, with $38 billion in exports. The majority of the nation's agricultural exports are shipped to developing and least developed nations. India exports agricultural and horticultural products and processed foods to approximately 120 countries, the majority of which are located in Japan, Southeast Asia, the SAARC countries, the European Union, and the United States.

Several official estimates (Census, Agricultural Census, National Sample Survey evaluations, and Periodic Labour Force Surveys) place the country's farmer population between 37 million and 118 million, depending on the criteria used. A number of definitions take into account the proportion of farms to cultivators. Some definitions include land ownership, while others endeavour to distinguish land ownership from the concept of farmer. Additionally, the term "cultivator" is employed.

A farmer is a person actively engaged in the economic and/or subsistence activity of cultivating crops and producing other fundamental agricultural commodities, according to the 2007 National Policy for Farmers of India. This definition includes all owners of agricultural operations, cultivators, agricultural labourers, sharecroppers, tenants, poultry and livestock producers, fishermen, beekeepers, gardeners, pastoralists, and non-farmers. Additionally, the term encompasses indigenous families and individuals engaged in shifting agriculture, as well as the collection, use, and sale of wood and non-timber forest products. India is the largest producer of a variety of fresh fruits and vegetables, including banana, mango, guava, papaya, and lemon, as well as major spices like chilli pepper and ginger, fibrous crops like jute, and staples like millets and castor oil seed, according to 2014 FAO world agriculture statistics. India is the second-largest producer of wheat and rice, two of the most vital commodities in the globe. India rates second in the world in terms of production of dry fruits, agricultural raw materials for textiles, roots and tuber crops, pulses, farmed fish, eggs, coconut, sugarcane, and a variety of vegetables. India was one of the top five agricultural producers in the world in 2010, accounting for more than 80% of total agricultural output, which included a variety of



revenue commodities such as cotton and coffee. In 2011, India was one of the world's top five producers of animal and poultry flesh, with one of the fastest growth rates.

Figure: Factors Impacting Farming

Source: Karipidis, P., & Karypidou, S. (2021). Factors that impact farmers' organic conversion decisions. Sustainability, 13(9), 4715.

The population of India is growing quicker than the country's ability to produce maize and wheat, according to a 2008 study. Other recent studies indicate that India can easily sustain its expanding population and export wheat and rice if it eliminates food waste, improves infrastructure, and increases agricultural output, similar to Brazil and China. Thanks to a typical monsoon season, Indian agriculture produced a record 85.9 million tonnes of wheat in the fiscal year ending in June 2011, an increase of 6.4% over the previous year. In India, rice production attained a new peak of 95,3 million tonnes, a 7% increase from the previous year. The output of lentils and other dietary staples has increased year after year. In 2011, Indian cultivators produced approximately 71 kilogrammes of wheat and 80 kilogrammes of rice per Indian citizen. The annual rice supply per capita in India now exceeds the annual rice consumption per capita in Japan. India was the seventh largest exporter and sixth largest net exporter of agricultural products in 2013, with total exports of $39 billion. Since net exports were approximately $5 billion in 2004, this demonstrates accelerated expansion. India has been the fastest-growing agricultural exporter over the past decade, with a net export of $39 billion, which is more than double the total exports of the European Union (EU-28). It has become a significant supplier of rice, cotton, sugar, and maize on a global scale. India exported

approximately 2,1 million tonnes of wheat and 2 million tonnes of rice to Africa, Nepal, and Bangladesh in 2011.

Aquaculture and commercial fisheries are two of India's fastest-growing industries. Between 1990 and 2010, Indian fisheries productivity increased by more than fourfold, while aquaculture yield nearly tripled. In 2008, India ranked sixth in terms of marine and freshwater capture fisheries production and second in terms of aquaculture cultivated fish production. 600,000 metric tonnes of Indian fish and crustaceans were shipped to nearly half of the world's nations. India is 20 percent behind in terms of protein consumption, which must be addressed by making protein-rich foods such as eggs, meat, fish, and poultry more affordable. Despite the fact that the current dietary standard meets all requirements, India is 20 percent behind in terms of protein consumption.

Sustainable farming methods aim to meet current agricultural needs without compromising the ability of future generations to meet their own needs. These methods focus on maintaining and improving environmental health, economic profitability, and social and economic equity. Here are some key sustainable farming methods:

1. **Agroforestry**: Integrating trees and shrubs into crop and livestock systems. This practice helps increase biodiversity, improve soil structure and health, and sequester carbon.
2. **Crop Rotation**: Growing different types of crops in the same area in sequential seasons. It helps in managing soil fertility and reducing soil erosion, as well as controlling pests and diseases.
3. **Cover Cropping**: Planting cover crops (such as clover or rye) during off-seasons when soils might otherwise be bare. This practice improves soil health, reduces erosion, and enhances water retention.
4. **Conservation Tillage**: Reducing the frequency of plowing or tilling the soil. It helps preserve soil structure, enhance water retention, and reduce erosion and carbon emissions
5. **Integrated Pest Management (IPM)**: Using a combination of biological, cultural, physical, and chemical tools to manage pests in an economically and ecologically sound manner. This reduces reliance on chemical pesticides and minimizes environmental impact.

6. **Organic Farming**: Avoiding synthetic inputs like synthetic fertilizers and pesticides. Organic farming relies on natural processes and cycles, and emphasizes the use of compost, green manure, and biological pest control.
7. **Permaculture**: Designing agricultural landscapes that mimic natural ecosystems. This holistic approach includes elements like water management, perennial plants, and sustainable buildings to create a self-sustaining system.
8. **Agnihotra Farming**: Involves performing a specific fire ritual to purify the environment and enhance soil fertility. It is believed to improve crop quality and yield, and reduce the need for chemical inputs
9. **Hydroponics and Aquaponics**: Growing plants without soil (hydroponics) or in combination with raising fish (aquaponics). These methods use less water and can be implemented in controlled environments, making them suitable for urban farming.
10. **Regenerative Agriculture**: Practices that restore degraded soils and improve biodiversity. This includes no-till farming, cover cropping, and using compost and animal manure to enhance soil health.

Adopting these methods can lead to more resilient agricultural systems, ensuring long-term productivity and sustainability. For more detailed insights, you can refer to resources like the USDA's National Institute of Food and Agriculture or the Food and Agriculture Organization (FAO) of the United Nations.

The adoption of sustainable farming practices in Madhya Pradesh, Chhattisgarh, and Karnataka has significantly impacted revenue generation for farmers by improving soil health, enhancing crop yields, and reducing dependency on expensive chemical inputs. Methods such as crop rotation, organic farming, and Agnihotra practices have led to more resilient agricultural systems, increased biodiversity, and reduced costs associated with fertilizers and pesticides. These practices not only ensure long-term soil fertility and environmental health but also provide economic benefits through higher productivity and market premiums for organic produce. Consequently, farmers in these regions are witnessing improved profitability and sustainable livelihoods, which contribute to the overall socio-economic development of rural communities

Throughout the past six decades, India has steadily increased the annual average kilogrammes per acre of a variety of agricultural products. The majority of these benefits have been realised

as a result of India's green revolution, which has led to enhanced transportation and energy infrastructure, heightened awareness of the benefits, and reforms. Agriculture has the potential to considerably increase productivity and output, as crop yields in India remain between 30 and 60 percent of the highest sustainable crop yields achievable in both developed and developing countries. In addition, India has experienced some of the world's largest post-harvest food losses due to inadequate infrastructure and unorganised retail.

2. LITERATURE REVIEW:

According to (Koner et al.,2021), this study examines the economic feasibility of two alternative organic farming models, namely Zero Budget Natural Farming (ZBNF) and Scientific Organic Farming. The empirical study examines two clusters in West Bengal, India, and compares two distinct organic agricultural methods (i.e., a ZBNF model in Purulia district and a scientific organic farming model in Burdwan district). Three key criteria are utilized to evaluate these models' performance: cultivation cost, yield, and profit. Organic farmers that followed both methods saw a decrease in the cost and yield of production per hectare for their crops during the post-conversion period. Additionally, data indicates that farmers who embraced the ZBNF model in Purulia improved their revenue, while farmers who practice scientific organic farming in Burdwan experienced a substantial decrease in income. Additionally, a detailed performance comparison of these two alternative models is performed to determine the variables affecting their long–term sustainability. The results indicate that the long-term sustainability of the organic model is dependent on the interplay of agro-climatic conditions and a number of other socioeconomic variables.(Chandrashekar, 2021) discusses the consequences of globalized agriculture for agricultural production and sustainability. Food is necessary for life to exist. 75% of Indian people earn their living through agriculture, and India is home to the world's fourth biggest farmer. Small and marginal farmers are wiped out when monoculture foods supplant biodiversity foods and marketplaces as farmers convert to seed purchasers. Agriculture provides for the everyday requirements of two-thirds of India's people. The majority of farmers, even marginal farmers, cultivate two-hectare plots. Land fragmentation, foreign agricultural inputs, and high levels of debt have jeopardized the lives of many farmers. Thus, organic farming is the only long-term viable option. as a professional in any field, makes significant 'U' turns and savors those experiences Composting generates

revenue. Obviously, there will be an increase in assets. Excellent social characteristics, which means organic farmers debate new ideas and practices that are intrinsically linked to improved human assets. Organic farms improve health and alleviate material and administrative burdens to the point that farmers will not seek for loans. agricultural assets rehabilitated: we actively participate in local festivities and interact with our community. The purpose of this essay is to examine the socioeconomic and organic condition of producers and farmers. According to (Kalvathy et al., 2021), agriculture accounts for a significant portion of India's GDP. Currently, research stresses the importance of organic matter addition to the soil through compost. The majority of farmers are unable to afford organic fertilizer and herbicides. Organic farming is advantageous for small and distant farms. It bodes well for the future of sustainable, nutritious, and compassionate agriculture. The present study will examine India's existing marketing and branding tactics. Both the supply chain and farmers must acknowledge and comprehend emerging business models. Enhances the biological, chemical, and physical properties of the soil via the addition of micro and macronutrients. Additionally, this study will aid in the marketing and branding of organic goods and services in India, which will help farmers. (Singh, 2021) succinct India is mainly an agricultural country. Almost three-quarters of its people survives solely on agriculture. As a consequence, agricultural advancements are intimately linked to the pleasure and happiness of the people of this nation. Agriculture in India continues to confront major difficulties as the country's population continues to increase. Crop types with high yields that react to fertilizers and irrigation, as well as intensive cropping methods, all represent a danger to the environment. Weeds, insects, and pests are a significant issue, since they wreak havoc on crops and their yield. Our economy is based on sustainable agricultural practices, particularly rainfed agriculture. Vegetables are important in the nourishment of humans, animals, and soil. As a result, organic agriculture is critical for crop yield and soil fertility.

According to (Debbarma et al., 2021), organic farming is a management approach that incorporates not only organic production techniques such as crop rotations, animal manures, compost, and natural additives, but also mineral rock, to promote and sustain productivity, cycles, and biodiversity. Organic farming has been practiced in India for a long period of time. This magnificent civilization was built on organic farming but was destroyed by the British. Organic farming in India will contribute to resolving the country's increasing food security

problems. (Behera et al., 2021) outline the cost and return on investment of different organic and inorganic agricultural methods. Organic farming is a result of the green movement. Organic agriculture is a rapidly growing subject that is actively debated by governmental and non-governmental organizations. Several research have been conducted on organic and inorganic agriculture, as well as numerous more on agricultural economic and developmental theories. Additionally, other writers approach agricultural studies from a variety of perspectives and paradigms. Numerous research indicate that organic farming is more profitable than conventional farming. Whether sustainable and lucrative, or not, According to the study, the government subsidized organic food, resulting in the creation of exclusive selling sites and the expansion of the organic supply chain. to aid in the growth of the worms Additionally, subsidies for bio-fertilizers and bio-pesticides, as well as sufficient market facilities for organic products and bio-input training, are critical for organic farming in India. Organic farming, according to Prakruthi et al. (2021), is a holistic approach that protects the climate, property, crops, animals, and people while also promoting and enhancing agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. Organic farming has a long and tumultuous history, and some consider it wasteful. Organic foods and beverages, on the other hand, are a fast expanding segment of the global food industry. Organic farming produces less crops than traditional agricultural techniques. They are, nevertheless, more profitable and environmentally sustainable than traditional farming, yielding crops that are comparable to or more nutritious while having fewer (or no) chemical residues. In today's global environment, organic food is becoming a global reality. This chapter summarizes organic agriculture, including global statistics, the scope and objectives of organic farming, a direct comparison of organic and conventional farming, the fundamental measures, forms, and components of organic farming, as well as organic farming's principles, benefits, and drawbacks.

(Pasupulla et al., 2021) stresses biodiversity and soil quality in organic agriculture by minimizing the use of pesticides. Organic agriculture has been proposed as a complementary and holistic form of production that prohibits the use of synthetic pesticides, fertilizers, growth hormones, and animal feed. It combines tradition, science, and innovation to improve soil health and contribute to global food and ecosystem security. Organic agriculture is introduced in this article by emphasizing important ideas, the significance of sustainability in order to optimize crop yields, and the main difficulties connected with organic agricultural food

production. Organic agriculture has grown at a pace of around 20% each year in order to provide nutritious food, show a better understanding of the environment's effect, and strive to build a sustainable environment for future generations.

Organic farming, as defined by (Seenirajam et al., 2021), is a technique of production that avoids the use of synthetic fertilizers, pesticides, and growth regulators. Crop rotations, crop wastes, animal manures, legumes, green manures, and biofertilizers are all integrated into this system. As a result of environmental deterioration, chemical pollution, and health risks, to mention a few, the present agricultural system is becoming unsustainable. The urgent need for an alternative agricultural strategy that is consistent with an environmentally friendly eco-system. Better soil fertility, improved water quality, avoidance of soil erosion, creation of rural employment, and so forth. According to (Ahmadi, 2021), agriculture in India has evolved dramatically during the past two decades. Globalization and liberalization policies have also improved the possibilities for agricultural growth. Agriculture received special attention from the Indian government and development planners due to its importance to the country's Gross Domestic Product (GDP) and employment, enabling this sector to significantly contribute to the country's financial growth and to raising the income and living standards of the vast majority of the population dependent on agriculture. Numerous problems have developed in Indian agriculture during the past 15 years, and they are becoming more serious. Agriculture also influences the country's growth rate, since India's economy is agricultural. Increases in the number of people reliant on agriculture will result in a decrease in per capita income owing to resource constraint. This is thought to be a major contributor to widespread rural misery and a high incidence of farmer suicides in different areas of the globe. There are many major impediments that must be overcome within a defined time frame in order to fix the problems before it is too late for anybody.

The research on the impact of sustainable farming practices on revenue generation for farmers in Madhya Pradesh, Chhattisgarh, and Karnataka has highlighted several benefits, yet notable gaps remain. Firstly, there is limited quantitative data specifically comparing the long-term financial outcomes of different sustainable practices versus conventional farming methods. This includes detailed cost-benefit analyses that consider variations in farm size, crop types, and local environmental conditions. Secondly, more research is needed on the scalability and adaptability of these practices across diverse agro-climatic zones within these states.

Additionally, there is a gap in understanding the socio-economic barriers farmers face when transitioning to sustainable methods, including access to markets, financial support, and knowledge dissemination. Finally, comprehensive studies that incorporate the effects of sustainable farming on broader ecosystem services and their indirect economic benefits are sparse. Addressing these gaps would provide a clearer picture of how sustainable farming can be optimized to enhance revenue generation for farmers in these regions.

3. OBJECTIVE OF THE STUDY

To conduct an analysis type of farming and its associated Revenue generation in India

4. RESEARCH METHODOLOGY

From October 2022 to February 2023, a comprehensive literature review was conducted on farming practices, revenue generation, and agricultural policies in Karnataka, Madhya Pradesh, and Chhattisgarh. This will help identify knowledge deficiencies and provide a foundational understanding of the current situation. Designed a questionnaire to collect information on agricultural practices, revenue generation, and related factors in the selected states. The survey should be designed to collect data on the types of commodities cultivated, agricultural techniques, inputs utilised, market access, and sources of revenue. Developed a sampling strategy that guarantees the representation of various farm types and regions within each state, including smallholder and commercial farms.Collecting data: Through personal interviews with farmers, focus group discussions, and secondary data sources such as government reports and databases, we collected data using the survey instrument.Around 450 responses were used for the study. Analyse the data using appropriate statistical techniques in order to identify patterns, trends, and relationships between agricultural practises, revenue generation, and other factors including market access and government policies. SPSS and Excel is used to analyse and interpret the collected data.

5. DATA ANALYSIS

Describes the statistical values of demographic variables considered for the study, In total 450 respondents is collected. Age factor has a mean value 2.94 with standard deviation 1.276, followed by gender with mean value 1, followed by Marital Status has a mean value 1.03 with standard deviation 0.161, followed by Farming type has a mean value 1.51 with standard deviation 0.527, followed by Education has a mean value 2.65 with standard deviation 1.169, followed by State(Resident of farmers) has a mean value 2.12 with standard deviation 0.786, followed by Size of the family has a mean value 2.09 with standard deviation 1.050, followed by Acres of land owned by farmers has a mean value 2.01 with standard deviation 0.906, followed by Income/ profit gained for one crop period has a mean value 3.40 with standard deviation 1.607, followed by Experience/ practice of farming has a mean value 2.65 with standard deviation 1.169. Mean value of Profit/ Income gained for one crop period is highest which proves that there is significant difference with respondents statements.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	450	1	5	2.94	1.276
GENDER	450	1	1	1	.000
MARITAL STATUS	450	1	2	1.03	.161
FARMING	450	1	5	1.51	.527
EDUCATION	450	1	6	2.65	1.169
STATE	450	1	3	2.12	.786
SIZE OF THE FAMILY	450	1	4	2.09	1.050
ACRES OF LAND YOU OWN	450	1	4	2.01	.906
INCOME/PROFIT (ONE CROP PERIOD)	450	1	6	3.40	1.607
HOW MANY YEARS OF FARMING	450	1	6	2.65	1.169
Valid N (listwise)	450				

Source: Primary Data collected from farmers

Table 2: Total Investment to Land in state (Selected Region)

STATE * INVESTMENT PATTERN

			INVESTMENT PATTERN				Total
			<6k	6k-8k	8k -10k	10k-12k	
STATE	KARNATAKA	Count	5	49	6	55	115
		% of Total	1.1%	10.9%	1.3%	12.2%	25.6%
	MADHYA PRADESH	Count	1	72	12	81	166
		% of Total	0.2%	16.0%	2.7%	18.0%	36.9%
	CHATTISGARH	Count	7	73	14	75	169
		% of Total	1.6%	16.2%	3.1%	16.7%	37.6%
Total		Count	13	194	32	211	450
		% of Total	2.9%	43.1%	7.1%	46.9%	100.0%

Source: Primary Data collected from farmers

Investment Pattern in different states in (selected regions) The investment Pattern includes both direct investment like labor, Machine, fertilizers etc. used for crop cultivation and the indirect investment include electricity bills, transport of crops etc. Hence the range is from six thousand to 12 thousand cost for a crop period for a acre of land. The values are approximate stated by the respondents.

In Karnataka, 1.1 % respondents say the investment range is less than 6k, 10.9 % say its around 6-8k, 1.3% say its around 8-10k and 12.2% say 10-12k of the total respondents. . In Madhya Pradesh , 0.2 % respondents say the investment range is less than 6k, 16.0 % say it's around 6-8k, 2.7 % say it's around 8-10k and 18.0 % say 10-12k of the total respondents. In Chhattisgarh 1.6 % respondents say the investment range is less than 6k, 16.2 % say its around 6-8k, 3.1 % say it's around 8-10k and 16.7 % say 10-12k of the total respondents. In Karnataka Maximum respondents state the investment range is between 6-8k,

In Madhya Pradesh, Maximum respondents state the investment range is between 10-12k and In Chhattisgarh Maximum respondents state the investment range is between 10-12k. In total, On the whole, Maximum farmers around 46.9% say, they spend around 10-12k on farming for a crop period on average considering states.

Table 3: Type of Farming and Revenue Generation (One Acres of Land)

TYPE OF FARMING * REVENUE GENERATION (ONE ACRES OF LAND)

			REVENUE GENERATION (ONE ACRES OF LAND)					Total
			LESS THAN 15K	16K-20K	21K-25K	26K-30K	MORE THAN 30K	
TYPE OF FARMING	AGNIHOTRA	Count	0	5	53	110	57	225
		% of Total	0.0%	1.1%	11.8%	24.4%	12.7%	50.0%
	CONVENTIONAL	Count	72	98	36	6	13	225
		% of Total	16.0%	21.8%	8.0%	1.3%	2.9%	50.0%
Total		Count	72	103	89	116	70	450
		% of Total	16.0%	22.9%	19.8%	25.8%	15.6%	100.0%

Source: Primary Data collected from farmers

Table 3 , states Revenue generation for one crop period on one acres of Land by the type of farmers. Revenue generation with regards to Agnihotra Farming, Total respondents are 225, out of which 1.1 % of the respondents state the revenue is between 16 -20k , 11.8% of the respondents state the revenue is between 21 -25k, 24.4% of the respondents state the revenue is between 26 -30k and 12.7 % of the respondents state the revenue is more than 30k. Revenue generation with regards to Conventional Farming, Total respondents are 225, out of which 16.0 % of the respondents state the revenue is between less than 15k , 21.8% of the respondents state the revenue is between 16 -20k, 8 % of the respondents state the revenue is between 21 -25k and 3 % of the respondents state the revenue between 26-30k and 2.9% state it is more than 30k. It is noted that that Revenue generated by Agnihotra farmers is comparatively high and stable with regards to conventional farmers. Most of the Agnihotra Farmers have stabilized revenue, the revenue for one crop period in case of Agnihotra farmers is above 15k per crop period and in one acres of land, so minimum revenue is generated and also they are also able to generate above 30k. Most of the respondents in Agnihotra farming have revenue generation between 26k-30k for a crop period. The revenue for one crop period in case of Conventional farmers is below 15k per crop period and in one acres of land, Most of the respondents in Conventional farming have revenue generation between 16k-20k for a crop period. Its clearly visible, that the Agnihotra farmers have stabilized and higher revenue generated when

compared with conventional farmers. The respondents stated that the crop period and revenue generation for crops varies each time depending upon climate, soil fertility, fertilizer, farming activities irrespective of investment activities. The values considered for the study are approximate values only stated by respondents.

From the chart 1, its clear that Revenue generated by Agnihotra farmers is comparatively high and stable with regards to conventional farmers. The majority of Agnihotra farmers have stable income; their revenue for a single crop season is more than 15k each crop period and on one acre of land, thus they make a minimum of income and are also capable of generating more than 30k. The majority of responders in Agnihotra farming earn between 26k and 30k every crop cycle.

Conventional farmers earn less than 15K as minimum for crop period whereas the majority of respondents earn between 16-20k per crop cycle on one acre of land. It is understood that Agnihotra farmers have stabilized and have generated more revenue than traditional farmers.

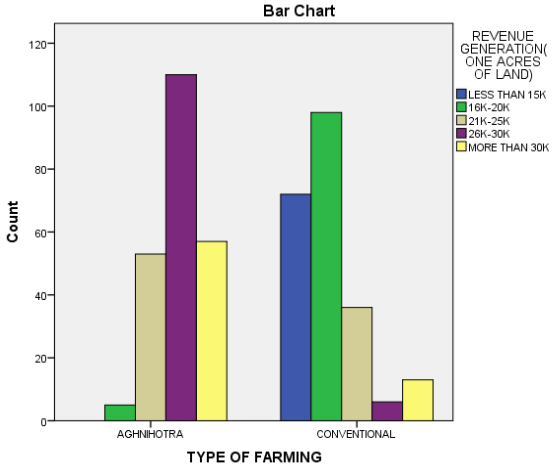


Chart 1:Revenue generation and type of farming

CASE 1: HYPOTHESIS

Hypothesis: Mean revenue of conventional farmers is equal to mean revenue of Agnihotra farmers

Table 4: Mean Revenue on type of farming

	TYPE OF FARMING	N	Mean	Std. Deviation	Std. Error Mean

REVENUE GENERATION (ONE ACRES OF LAND)	AGNIHOTRA	225	3.97	.761	.051
	CONVENTIONAL	225	2.07	1.052	.070

States the revenue generation mean values on type of farming, Agnihotra farming has a mean value of 3.97 and that of conventional farmers are having mean value 2.07. The mean revenue of conventional farmers are comparatively lower than Agnihotra farmers with mean difference of around 1.9.

With regards to the standard deviation, revenue generation on type of farming, Agnihotra farming has a STD value of 0.761 and that of conventional farmers are having STD value 1.052. Table 5, gives independent T- test value measuring the equality of means, using Levene's test for equality of variances. In Levene's Test for Equality of Variances, when assumed- F value = 10.181 and P value = 0.002, where the P value is less than 0.05, This implies that we reject the null hypothesis of Levene's Test, it suggests that the variances of the two groups are not equal; i.e., that the homogeneity of variances assumption is violated. Hence there is significant different in the type of farming and Revenue generation. With T- test for Equality of Means, With equal variance assumed, t- value is 22.021, df =448 and P value= 0.000 very small(< 0.05) with mean difference of 1.907at 95% confidence interval of differences having lower value 1.737 and Upper value 2.077. This proves that there is significant difference with regards to mean value of Agnihotra and Convention farming and when equal variance are not assumed , t- value is 22.021, df =408.9 and P value= 0.000 very small(< 0.05) with mean difference of 1.907at 95% confidence interval of differences having lower value 1.736 and Upper value 2.077.

Table 5: T-Test – Revenue Generation and Type of farming

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference

									Lower	Upper
REVENUE GENERATION (ONE ACRES OF LAND)	Equal variances assumed	10.181	.002	22.021	448	.000	1.907	.087	1.737	2.077
	Equal variances not assumed			22.021	408.09	.000	1.907	.087	1.736	2.077

CASE 2: HYPOTHESIS

Alternative hypothesis: There is an effect of farming on revenue generation

Table 6: Regression- Dependent/ Independent Variable

Variables Entered/Removeda			
Model	Variables Entered	Variables Removed	Method
1	TYPE OF FARMING	.	Enter

a. Dependent Variable: REVENUE GENERATION (ONE ACRES OF LAND)
b. All requested variables entered.

Table 6 Shows, variables entered for the study, the dependent variable is Revenue Generated for one crop period in a acre of land and the independent variable is Type of farming i.e. Agnihotra and Conventional.

Table 7: Regression- Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.721a	.520	.519	.918

a. Predictors: (Constant), TYPE OF FARMING
b. Dependent Variable: REVENUE GENERATION(ONE ACRES OF LAND)

The Model Summary states that R value= 0.721, R square value =0.520 and Adjusted R Square

Value =0.519 with the Std. Error of 0.918. The Alternative hypothesis is accepted, As the R square value is greater than 0.5, that proves significant relationship between the variables i.e. There is 52% significant relationship in the difference between type of farming and Revenue generation(i.e. good fit for the model)

Table 8: Regression- Anova

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	408.980	1	408.980	484.922	.000b
	Residual	377.840	448	.843		
	Total	786.820	449			

a. Dependent Variable: REVENUE GENERATION(ONE ACRES OF LAND)
b. Predictors: (Constant), TYPE OF FARMING

The Anova table shows the regression mean square value =408.980, F (1, 448)= 484.922 and the P value = 0.00 at less than 5% significance (0.05). A value is greater than 1 for F-ratio yield efficient model. This shows that there is significant difference in the type of farming chosen/ practiced and revenue generated (i.e. the model is good fit)

Table 9: Regression- Coefficient

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	5.880	.137		42.951	.000	5.611	6.149
	TYPE OF FARMING	-1.907	.087	-.721	-22.021	.000	-2.077	-1.737

a. Dependent Variable: REVENUE GENERATION(ONE ACRES OF LAND)

The Regression Equation : Revenue Generation = 5.880+(-1.907)Type of farming

From the Co-efficient table 4.2 : shows the strength of the relationship i.e. the significance of the variable in the model and magnitude with which it impacts the dependent variable. with regards to unstandardized coefficient with and standardized beta value= -0.721, with t value =22.021, and p value = 0.000 <0.05, at 95% confidence interval, this proves that there is statistically significant relationship in the model.

6. DISCUSSION & CONCLUSION:

The adoption of sustainable farming practices in Madhya Pradesh, Chhattisgarh, and Karnataka has shown promising results in improving farmers' revenue generation. These practices enhance soil health, boost crop yields, and reduce dependency on costly chemical inputs, thereby lowering production costs and increasing profitability. Conventional farming destroys the agro-ecological system and flora and wildlife. This farming also causes splitting headaches, burning eyes, and exhaustion. Overuse of chemical fertilisers and pesticides has poisoned our produce. The Green Revolution also reduced agricultural variety and biodiversity, which negatively affected soil. Farmers must import pulses from other nations, resulting in debt. They feel anxious and commit suicide if they don't pay their bills. Insecticides and pulses must be imported. We examined agricultural practices and development in Maharashtra, Chhattisgarh, and Karnataka to determine the effects of organic and conventional farming. In Karnataka, 6.7% of responders are from Pandavpura, 8.2% from Chamrajpet, and 10.7% from Mandya. In Madhya Pradesh, 7.8% of responders are from Dhar, 13.1% from Bhopal Berasia, 9.6% from Sundrel, and 6.4% from Meghaliya Hatt.6.4% of Chhattisgarh respondents are from Raipur, 23.3% from Dhamtari, and 7.8% from Durg. Karnataka has 115 responders, 25.6% of whom practice Agnihotra farming and 12.7% traditional farming. In Madhya Pradesh, 18.0% of respondents practice Agnihotra Farming and 18.9% do traditional farming. The state of Chhattisgarh has 169 responders, 37.6% of the total, 19.1% of whom do Agnihotra farming and 18.4% conventional farming. Agnihotra and conventional farmers make up 50% of responses.

Organic farmers have benefited more than conventional farmers in terms of profits and environmental protection, but their economic viability depends on economic, financial, and demographic factors. Economic and financial factors effect more than demographic factors,

although financial and demographic factors do not significantly affect each other with the variables evaluated for the research. Additionally, the premium market prices for organic and sustainably grown produce contribute positively to farmers' income. However, the full potential of these benefits is not yet fully realized due to various challenges and research gaps.

7. RECOMMENDATIONS

a) **Comprehensive Data Collection**: Conduct detailed longitudinal studies comparing the financial outcomes of sustainable and conventional farming methods across different crops and farm sizes. This will provide a clearer picture of the economic benefits over time.

b) **Scalability and Adaptation Research**: Investigate how sustainable practices can be adapted to various agro-climatic zones within these states to ensure broader applicability and effectiveness.

c) **Support Systems**: Enhance support systems for farmers, including access to financial resources, markets for sustainable produce, and educational programs to facilitate the transition to sustainable farming.

d) **Policy Interventions**: Develop and implement policies that incentivize sustainable farming practices, such as subsidies, tax breaks, and technical support.

8. LIMITATIONS

a) **Lack of Quantitative Data**: There is insufficient quantitative data on the long-term financial benefits of sustainable farming practices, making it challenging to draw definitive conclusions.

b) **Variability in Practices**: The diversity of sustainable farming practices and their varying impacts across different regions and farm sizes create challenges in standardizing recommendations and measuring outcomes.

c) **Socio-Economic Barriers**: Farmers face significant socio-economic barriers, such as initial investment costs, lack of access to markets, and inadequate knowledge transfer, which hinder the widespread adoption of sustainable practices.

d) **Environmental Variability**: The impact of sustainable farming practices can vary widely due to differences in local environmental conditions, making it difficult to generalize findings across broader regions.

Addressing these limitations through focused research and targeted interventions can help

optimize sustainable farming practices and maximize their benefits for farmers in Madhya Pradesh, Chhattisgarh, and Karnataka

REFERENCES:

1. Abhang P, Patil M. and Moghe P. (2015), Beneficial Effects of Agnihotra on Environment and Agriculture,(Book),5(2).
2. Abhang, P., & Pathade, G. (2017). Agnihotra Technology in the Perspectives of Modern Science-A Review. Indian Journal of Traditional Knowledge, 16(3), 454-462.
3. Adhikari, R. K. (2009). Economics of organic vs inorganic carrot production in Nepal. Journal of Agriculture and Environment, 10, 27-33.
4. Ahmadi Begum. (2021). Challenges of the Agriculture Economy in The India. International Journal of Modern Agriculture, 10(2), 3004 - 3011. Retrieved from http://www.modern-journals.com/index.php/ijma/article/view/1117
5. Alexandra M. (2013), Organic versus Conventional: Advantages and Disadvantages of Organic Farming, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 13, Issue 1, pp 253-256.
6. Aulakh CS, Ravisankar N (2017), Organic Farming in Indian Context: A Perspective, Agric Res J, Vol 54, Issue 2,pp 149-164.
7. Azam, M. and Shaheen, M. (2019), Decisional Factors driving Farmers to Adopt Organic Farming in India: A Cross-Sectional Study, International Journal of Social Economics, Vol. 46, Issue 4, pp. 562-580.
8. Azam, M. S. (2015). The influence of socio-demographic factors in adopting organic farming practices. International Journal of Interdisciplinary and Multidisciplinary Studies, 2(5), 8.
9. Azam, M. S., & Shaheen, M. (2019). Decisional factors driving farmers to adopt organic farming in India: a cross-sectional study. International Journal of Social Economics.
10. Azam, M. S., Shaheen, M., & Narbariya, S. (2019). Marketing challenges and organic farming in India—Does farm size matter?. International Journal of Nonprofit and Voluntary Sector Marketing, 24(4), e1654.
11. Babita, Ahmed N, Thakur M.(2015), Organic Farming: A Holistic Approach towards

Sustainable Fruit Production, European Journal of Pharmaceutical and Medical Research, Vol 2, Issue 6, pp 108-115.

12. Banjara RK. (2016), Sustainable Model of Organic Agriculture: A Case study of Nepalese Farmers, Journal of Advanced Academic Research, Vol 3, Issue 1, pp 142-163.
13. Behera, P. K., & Bhoi, B. (2021). COST AND RETURN ANALYSIS OF INORGANIC AND ORGANIC AGRICULTURE: A LITERATURE REVIEW. International Journal of Modern Agriculture, 10(1), 824-834.
14. Bengtsson, J., Ahnström, J., & WEIBULL, A. C. (2005). The effects of organic agriculture on biodiversity and abundance: a meta-analysis. Journal of applied ecology, 42(2), 261-269.
15. Berde, C., Kulkarni, A., Potphode, A., Gaikwad, A., & Gaikwad, S. (2015). Application of Agnihotra ash for enhancing soil fertility. International Journal of Science, Engineering and Technology Research (IJSETR), Forthcoming.
16. Bhutani S, Kahlon S, Monika (2018), Organic Farming in India: An Alternative Agricultural System, Amity Journal of Agribusiness, Vol 3, Issue 1, pp 37-49.
17. Bisht, I. S., Rana, J. C., & Ahlawat, S. P. (2020). The Future of Smallholder Farming in India: Some Sustainability Considerations. Sustainability, 12(9), 3751.
18. Bissa, S. (2015). Agnihotra: A boon to humanity. International Education and Research Journal, 1(5), 93-94.
19. Biswas RK, Majumder D, Sinha A. (2011), Impacts and Constraints Evaluation of Organic Farming in West Bengal, Agro-Economic Research Centre Visva – Bharati, Santiniketan 2011.
20. Biswas, S., Ali, M. N., Goswami, R., & Chakraborty, S. (2014). Soil health sustainability and organic farming: A review. J Food Agri. Environ, 12(3&4), 237-243.
21. Brunda R. (2011), Response of Tomato to Homa Organic Farming Practices, Thesis submitted to the University of Agricultural Sciences, Dharwad in partial fulfillment of the requirements for the Degree of M.Sc in Plant Biochemistry.
22. Cacek T and Langner LL,The economic implications of organic farming, American Journal of Alternative Agriculture, Virtual Library.
23. Chandrasekhar H.M. (2010), Changing scenario of organic farming in India: An

overview, International NGO Journal, Vol 5, Issue 1, pp 35-39.

24. Chandrashekar, H. M. (2010). Changing scenario of organic farming in India: an overview. International NGO Journal, 5(2), 34-39.
25. Chandrashekar, H. M. (2021). Organic Farming and Rural Entrepreneurship Development: A Study in Mysore District, Karnataka.
26. Charyulu D.K. and Biswas S. (2010), Economics and Efficiency of Organic Farming vis-à-vis Conventional Farming in India, Research and Publications, Indian Institute of Management, Ahmedabad
27. Cisilino, Federica and Madau, Fabio A. (2007), Organic and Conventional Farming: a Comparison Analysis through the Italian FADN, Munich Personal RePEc Archive.
28. Connor, D. J. (2008). Organic agriculture cannot feed the world. Field Crops Research, 106(2), 187.
29. Crowder, D. W., & Reganold, J. P. (2015). Financial competitiveness of organic agriculture on a global scale. Proceedings of the National Academy of Sciences, 112(24), 7611-7616.
30. Curry-Roper, J. (1992). Alternative agriculture and conventional paradigms in U.S. agriculture. In I. Bowler, C. Bryant, and M.D. Nellis (Eds.), Contemporary Rural Systems in Transition: Agriculture and Environment (pp. 254-264). Wallingford: CAB International.
31. Dani, V. V., & Dasgupta, M. (2021). GoBhaarati-contributing to the "Journey of Healthy Living". Emerald Emerging Markets Case Studies.
32. Das J, Bhattacharyya D. (2018), An Enquiry into the Challenges of Organic Farming in Sikkim, Business Studies--Volume--34, Issue 1 & 2.
33. Das, S., Chatterjee, A., & Pal, T. K. (2020). Organic farming in India: a vision towards a healthy nation. Food Quality and Safety, 4(2), 69-76.
34. David Le Blanc(20150,Towards intergration at last,the sustainable development goals as a network of targets,Departement of Economic and Social Affairs,Desa,Working paper no 141,ST/ESA/DWP/141.
35. De Ponti, T., Rijk, B., & Van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. Agricultural systems, 108, 1-9.