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Adoption of Organic Farming; A Systematic Review and Meta Analysis

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Abstract: Recognize the indication-based variables that excite the growth of organic farming practices. The major goal is to compare and contrast organic farmers' mentalities and pursuits in relation to the areas of agricultural goods produced on their farms. Using a numerous case study technique, the causes that drove organic food, field crops, farms, and dairy to adopt an organic farming technique were explored**.** The study's approach to the problem of explaining the components of farmers' organic innovation adoption while comparing the various types of farmers is based on the notion of adoption, which is drawn from diffusion theory. According to this study, early, moderate, and late consumers react differently to both financial as well as non-financial variables when deciding whether or not to accept organic practices. This is due to the fact that not all farmers utilize the same technique at the same time. The adoption rates of diverse groups of people in the research site are analyzed using the logographic model. According to the statistics, there are significant differences in the features of the different adopter groups.

Keywords: Agriculture; farmers; determining elements; adoption; conversion; sustainability; organic farming

1. INTRODUCTION

To boost a farm's natural fertility, organic farmers use agriculture, partner planting, bio pesticide treatment, and typically compost, organic manure, and bone meal. Pest control is achieved through the use of mixture crops and the encouragement of beneficial insect predators, but synthetic petrochemical pesticides and fertilizers, Hormones, antibiotic use in cattle, genetic modification, human sludges, and non-materials are banned as growth regulators. The agricultural strategy is notable for its sustainability, accessibility, adaptation, health, and security (Alvin et al., 2018). Organic farmers' earnings may be more variable if organic farms produce a wider range of products. At the same time, we believe that because environmental farms have a smaller diversity of management strategies and management features than traditional agriculture, they will have less variability in preserving the environment (Reganold and Wachter, 2016).

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1.1 Sustainability over the long term

Many climatic impacts are slow and gradual, taking place over time. Organic agriculture investigates the productivity of farming practices by examining agroecosystems and their long-term consequences. To avoid problems with soil fertility and pests, the goal is to generate food while maintaining the environment. Rather than managing complaints as they develop, organic agriculture takes anactivemethod.

Soil: Cover crops, crops, ecological partnerships, cover harvests, biofertilizers, and minimum tilling are all significant soilstructureapproaches in organic farming. These enhance soil production and structure while also stabilizing systems by encouraging soil flora and fauna. As a result, energy and nutrient cycling, as well as the water and nutrient properties of the soil, improve, making up for the lack of mineral fertilizer.These management techniques help reduce soil erosion. All of these characteristics contribute to the conservation and growth of soil productivity by lowering the soil's exposure to erosive pressures, increasing soil biodiversity, and reducing nutrient losses. Even though farm-derived renewable resources usually compensate for soil nutrient export, it is occasionally required to feed biological soil additional potassium, phosphate, calcium, magnesium, or other essential minerals from external sources.

Water: In many agricultural locations, environmental contamination from artificial fertilizers and pesticides is a big problem. To improve soil structure and water penetration, organic agriculture employs organic fertilizers (such as waste, animal waste, and organic manure) and increased diversity (in terms of farmed and permanent vegetation). Well-managed small farms with a greater capacity for nutrient retention reduce groundwater contamination dramatically. As a solution in particular locations where contamination is a simple problem, the change to organic farming is intensively encouraged (e.g., by the administrations of France and Germany).

Air and weather change: Organic agriculture minimizes the use of nonrenewable energy to eliminate the need for agrochemicals (which need huge amounts of fossil fuel to be produced). Producing these requires substantial quantities of fossil fuel. The capacity of organic agriculture to store huge quantities of carbon contributes to the reduction of greenhouse gases. Many organic agricultural management methods (such as reduced tillage, restoring crop wastes to the land, utilizing cover crops and intercropping, and increasing the use of ammonia legumes) enhance carbon return to the soil, hence enhancing soil fertility and carbon sequestration**.** Numerous studies reveal that the carbon content of organic soil is much higher when organic agriculture is practiced. The greater the quantity of soil photosynthetic that is preserved, the greater agriculture's potential to buffer climate change. Nonetheless, there is far more.

Biodiversity:Farmers are both guardians and producers of all biodiversity levels. Agricultural practices both protect and exploit genetic diversity. Conventional and adaptive seeds and breeds are chosen at the genetic level due to their better resistance to illness and climatic anxiety tolerance. Variedgroupings ofanimalsandplants enhance agricultural productivity at

the species level. Natural areas both within and without farmland, and also the absence of agrochemicals, focus on providing ideal habitat for wildlife at the ecosystem level. Utilizing underutilized species (typically rotation oats to increase soil fertility) reduces agricultural and Agri-loss and actually results in a robust gene pool-the basis for future adaptation. It is intended that the provision of adequate that would provide food and housing, as well as the utter lack of pesticides, will attract or reinstitute animals.

1.2 The Concept of Adoption and Organic Farming

Several factors contribute to the expansion of the agricultural sector, with technology playing one of the most important roles. According to Sunding and Ziberman (2002), technological progress has shaped the agriculture sector during the previous 100 years. Because of the role of technology, scholars have been drawn to investigate the adoption of new farming techniques (particularly in developing nations). Theybelieve agriculture will continue to play a significant role in these nations. Similarly, Doss (2006) found that improving agricultural technology was one of the most effective strategies to increase agricultural productivity. As a result, this paper will briefly explore the implementation of adoption as well as organic farming. More than four decades have passed since research on innovation adoption was conducted. Rogers' concept in his amazing book, "Diffusion of Innovation," is one of the most popular adoption models. These adoption models are widely used as a foundational principle in a variety of fields, including economics, communication, public health, history, politics, technology, and education (Dolley1999). Certainly, Rogers' model was widely used in several studies on agricultural technology uptake. Rogers (2003) advocates a different meaning of the term’s technology and innovation, though they can be used interchangeably at times.

More than four decades have passed since research on innovation adoption was conducted. Rogers' concept in his amazing book, "Diffusion of Innovation," is one of the most popular adoption models. These adoption models are widely used as a foundational principle in a variety of fields, including economics, communication, public health, history, politics, technology, and education (Dolley1999). Certainly, Rogers' model was widely used in several studies on agricultural technology uptake. Rogers (2003) advocates a different meaning. "A design for instrumental activity that decreases the uncertainties in the cause-effect association involved in reaching a desired goal" is how technology is defined.

Meanwhile, an individual or other unit of adoption perceives an innovation as a new concept, practice, or endeavor. "As a result, an idea is an invention as long as it is seen as novel by others. As a result of this definition, the term "innovation" now refers to a far broader field than just technology. Innovation emphasizes the process of creation (both major development and modification), whereas technology focuses on function. Sunding and Zilberman (2000), for example, described innovation as "a new method, custom, or devices used to execute a new task." As a result, both the phrases "technology" and "innovation" are significant, albeit they are sometimes used interchangeably. Mechanical, biochemical, chemical, agricultural, biotechnological, and informational innovations are all possible. Another distinction is made between product and process innovations. Furthermore, the effects of innovations on economic agents or exchanges can be distinguished. This type of innovation has the ability to

boost yield, lower costs, improve quality, reduce risk, improve environmental protection, and extend shelf life. In terms of technology, there are two components: hardware and software. The former refers to "the tool that embodies technology as part of a tangible or physical item," whilst the latter refers to "the tool's information base." The technology is frequently not observable because it is software. As a result, it has a slow rate of adoption. Moreover, Feder et al. (1985) stated that hardware consists of both indivisible and divisible technology (i.e., mechanical and other tools) (e.g., high-yielding). The software component appears as a collection of information, such as communication methods and marketing techniques, after the technology is created.

1.3 Major problems in marketing Indian organic products

- Low quality uniformity of quality
- Slow shipment, importing limitations
- This is a lengthy and difficult paper.
- Working with export authorities on Indian organic products
- The primary issue in export marketing is bad customer trader service from Indian after sales.
- Network marketing installation is not done properly.

2. LITERATURE REVIEW

Sapbamreret al., (2021)conducted A Comprehensive Model of the Influencing Factors on the Implementation of Organic Farming by Farmers This study provides details on the following critical factors: (4) considerations associated to organic agriculture (training, expertise support, organic agriculturalist neighbors, information attainment, membership in an association, and extension associates). This research aims to expand our knowledge of organic agricultural development by analyzing the dissemination process. The study offers a difference among users and non-adopters which is more nuanced than the conventional separation among adopters and non-adopters. Multinomial logistic analysis enables the exploration of variables distinct to each group. Thus, we examine whether adoption-related characteristics alter as a result of policy alterations during the dissemination process.

NiklasMöhring et al., (2021)A rigorous herbicide standard has been imposed in Switzerland but not for organic farming. Farmers' assessments of the production system's environmental benefits are required for adoption. Farmers' expectations for programmed output gains are particularly important. Farmers who believe the initiative would result in considerable output losses and higher production risk are much less likely to join on the basis of our findings, we evaluate the consequences, leverage points, and difficulties associated with the design and implementation of large-scale agricultural systems free of pesticides. According to the goal of the project, good communication on environmental advantages to farmers and explanations of programme implementation on productivity (risks) are essential for the implementation of novel, pesticide-free methods of production. Agricultural extension, innovation, or the integration of research initiatives may be necessary to promote these processes. In addition, it is crucial to disseminate knowledge and advice on efficient and cost-effective management

practises and beneficial fungicide agricultural experiences (i.e., to alter expectations).Lastly, our findings suggest that the adoption of measures, such as tailored insurance for equity funds, might be an essential pillar for the effective application of these production schedules. To determine how ubiquitous the layout of glyphosate systems may be, it is necessary to conduct more studies in various countries or crops. In addition, it should examine acceptance processes in greater depth, focusing on risks, risk tolerance, and producer expectations. Future research will concentrate on the possible long-term properties of cumulative herbicide wheat agricultural on wheat pricing, including conservative, pesticidefree, and living wheat farming participation.

Christian Schader et al., (2021) conducted howis organic farming's agronomic and economic performance in sub-Saharan Africa? Depending on our experiences, this study recommends that organic agriculture programmes engaging smallholders should be executed more efficiently. Significant agronomic and institutional issues include restricted capacity, an absence of sufficient inputs, and access to the market. Define organic farming methods based on their intent to function spontaneously and, the degree to which they adhere to organic principles to facilitate a more nuanced discussion on the desirability of various forms of organic farming. This will aid in the creation and execution of policy interventions that support the expansion and sustainability of farming production. Despite providing consumers with more expensive food, organic farming has lower exteriorcharge to civilization (example for fresh water,habitat, and worker well-being) than traditional agriculture (e.g., aimed at safe water, wildlife conservation, and employee health) (Seufert &Ramankutty, 2017).
As is now the case with SSA's certified OA, consumers should never shoulder the full cost of delivering society's vital facilities(Braun&Birner2017). That was a definitive freerider problem, since just a minority of buyers would tolerate higher prices for organic foods, OA wouldn't be the dominant intergovernmental body. Therefore, governments should make an effort to incorporate these effects, thus enhancing the protest of the efficacy of organic production, or they should facilitate the personal finance of this type of capacity income and national perspectives once more for the execution of OA and let smallholders to involve in it.

ManchalaSanthoshkumaret al. (2017) conducted A Review on Organic Farming Sustainable Agriculture Development Modern agriculture. This research confirms that modern agriculture encompassing the use of fertilizers and pesticides has had a harmful effect on the environment by affecting soil health, total alkalinity, the development of insect resistance, genetic disorder in plants, but also an increase in toxic impurities through the food chain & animal feed, which now has led to an increase in health issues and perhaps other serious health issues, as well as ecological pollution. Organic agriculture provides nutrients to plants and enhances the physical, biochemical, and organic qualities of the soil. The usage of chemical fertilizers has had a negative effect on the environment by affecting soil health, total hardness, the development of insect resistance, the genetic differences of plants, and indeed the increase in harmful by - products through food chain & animal feed, which has led to increase in health problems and other serious health concerns. Organic agriculture provides plants with macro-and micronutrients and advances the physical, biochemical, and

physiological characteristicsof the soil. This study seeks to expand alertness of the damagingimpacts of insecticides on humans, soil, and the habitat; thus, artificial farming is giving way to sustainable farming. Due to its diverse agro-climatic conditions, India has a considerable potential for organic agriculture and produces a wide range of organic products. Farming in Pakistan is limited by the high cost of organic produce and a lack of efficient local marketing strategies.

Rajendra, Net et al., (2016) conducted a Comprehensive Analysis of Influencing Factors of Sustainable Agricultural Practices Integration This report offers the analysis of vote totals demonstrates that variables indicating economic incentive and facilitation frequently characterize the behaviour of farmers. Additionally, a groundbreaking study demonstrated that features showing better learning and managerial skills served as additional indications of adoption. Specifically, the training offered by non-governmental administrations and rural enterprises enhances the work of leading change (i.e.,Community development solutions). Though this is a originalconclusion, further investigate is compulsory to create a full information of agriculturalist sensitivity to packaged sustainable agriculture practice and the administrations (private standards) within which farmhouse economic survival is contingent on the implementation of good agricultural practices. This study aims to improve our understanding of the study, which would be particularly vital for a novel phenomenon: corporate norms (i.e., GAP). Despite the detail that anincreasing number of governments, non-profit organizations, trade agencies, and private corporations are partnering to build SAPs as an integral part of commercial standards, our research indicates that this developing area is understudied. Additional empirical data is required to comprehend the response of producers to this sort of original setting, which influences both agricultural practices and farm occupational, in order to fully comprehend their behaviour.

Doris Läpple et al., (2011) Does there exist disparities between early and midway adoption of organic agricultural practices? This study reveals that the elements that influence adoption play a varied role for early, moderate, and late adopters, especially in terms of agricultural intensity, age, information gathering, and farmer attitudes. Adopters were notably younger than other groups, and they opted for lower-income options. Although environmental attitudes and social learning are recognised as significant influences for all adopter groups, late adoption is limited by risk factors. Overall, the findings imply that the present stage of dissemination must be addressed for government programmes to be effective. This research seeks to increase the impact of organic farmers on conventional farms. Our empirical findings indicate that examining the variations across adoption groups may yield unique insight into the processes of technology diffusion if such research is conducted. In addition, research on the application of organic agricultural practices is required since healthy produce is in its youth and appeals to a limited population in Ireland, where lawmakers are eager to expand the organic sector. There is evidence that greater government assistance for sustainable agriculture has encouraged the implementation of sustainable agriculture, but it also appears to have altered the qualities associated with adoption. This study demonstrates that conversion parameters change over time. However, environmental perspectives have

emerged as animportant factor in the growth of organic farming, and any further policy reforms should highlight the future environmental benefits of good farming.

Menale Kassie ET AI., (2008) Evidence from the Semi-Arid Highlands of Ethiopia on theSystematic Implementation of Organic Farming Knowledges. This learning provides evidence that poverty and access to knowledge, among other factors, strongly influence the choice of farming techniques. In addition, we find evidence that the effect of gender on technology acceptance is technology-specific, but the relevance of plot features indicates that the choice to adopt particular technologies is location-specific. This study aims to improve and the use of stochastic supremacy analysis supports the claim that sustainable farming practices increase productivity; they are even superior to the use of chemical fertilizers, justifying the need to start investigating factors affecting the adoption of different technologies. However, the age of the household head, by influencing dislike of risk and/or life cycle dynamic behavior, will also have a differential impact on adoptive parents depending on the type of technology. In the same way that the availability of family labour circumstances influences the decision of technology used, provided that labour requirements vary by technology. Therefore, public policy should consider the influence of these socioeconomic factors. This implies that the guarantee of future gains to adoption is a crucial factor in adoption decisions, so policymakers should aim to provide tenure security for farmers. In addition, the relevance of plot features implies that the decision to adopt particular technologies is site-specific; thus, public policy should be guided by evaluations of how various sustainable agriculture practices are influenced by plot characteristics. Consequently, the next intriguing research subject would be to examine how plot features influence the production implications of various agricultural techniques and to utilize this information to design policy.

3. METHODOLOGY

Farmers from each of the indicated farming groups (i.e., produce, row-crop, livestock, and dairy) were located, contacted, and interviewed as part of this study's multiple case study research approach. Farmers in the reviewer's unique cases that, when compared, provide a basis for discovering potential variances in farmers' motivations and perspectives based on their product sector.

3.1. Search Strategy

We used the phrases "aspect" or "element" or "driver" in conjunction with "organic farming" or "food production" and "adapt" or "convert" to search for relevant articles in libraries such as:(Web of Science), Researchgate, Pub Med, or Google and Google Scholar. Organic farmers have an influence on conventional farmers, according to the PRISMA (Preferred Reporting Review and Meta-Analysis) framework. To conclude, our empirical findings show that examining the distinctions among adopter groups can provide fresh insights into a technology's diffusion process. Furthermore, research into organic adoption is critical because organic farming is still in its early stages and only attracts a small group of participants in Ireland, where policymakers are anxious to expand the sector.

Increased governmental support for organic farming appears to have had an influence on adoption, but it also tends to have an effect on the qualities that are related to acceptance. The components fluctuate depending on the period of conversion, as demonstrated in this research. Nonetheless, environmental views emerged as a key factor in organic farming's acceptance, and any future legislative modifications should emphasize organic farming's anticipated positive environmental impact.

3.2 Interview

Primary data was collected through interviews with the members involved in farming. Information regarding the environment of the village, whether or not they are performing organic or inorganic farming and other factors affecting the adoption of organic farming was collected through personal interviews with the inhabitants using preprinted Paper-Pen questionnaires.

4. DISCUSSION

Organic farming practices are not novel or inventive, and thus should not be classified as "adoption of innovations. “Obtaining organic certification, on the other hand, might be considered the adoption of a market and/or farm innovation capability (record keeping and the possible use of new practices). Farmers evaluate organic certification acceptance using the same broad criteria they use to evaluate other breakthroughs. While organic farming processes may not have been novel to all of the respondents in the study, each operation's embrace of organic marketing and certification may have been different. The research also reveals that government support in the form of resources, finance, markets, and subsidies is essential for promoting the implementation of organic agriculture. Government policy should facilitate easy access for organic farmers to agricultural water sources, financing, and market possibilities. Government policy should encourage extension services to progressively influence chemical handlers' perceptions and behaviours. The administration must invest in research and offer organic farmers incentives. Therefore, extension personnel, farm organizations, and bureaucracy all show a crucial role in encouraging the sustainable implementation of organic agricultural.

5. CONCLUSION

Agricultural production is capable of producing high-quality food without harming the soil or the ecosystem. Regionally suitable crops or products for organic production that satisfy worldwide market demands are required. Due to its commitments to maintain food security and nutrition, the area as a whole cannot afford to switch to organic agriculture. This will provide a large number of employment opportunities and bring wealth and peace to the region. Given the strong and rising demand for agricultural products, describing environmental effects per unit of production appears to be more significant from a global standpoint. It is a style of farming that promotes food and fibre sources that are environmentally, socially, and economically sustainable. Inorganic farming is giving way to organic farming as people become additionalconscious of the negative effects of insecticides on human well-being, soil, and the atmosphere. Due to its diverse agro-climatic conditions,

India has a lot of potential for organic farming and produces a lot of organic products. In India, organic agriculture is hampered by high product prices and ineffective marketing in local markets.

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