DETERMINING FARMERS INTENTION TOWARDS ADOPTION OF ORGANIC AGRICULTURAL PRACTICES USING STRUCTURAL EQUATION MODELING (SEM)

THESIS

Submitted in partial fulfilment of the requirements for the Degree of

MASTER OF SCIENCE

IN

AGRICULTURE (EXTENSION EDUCATION)

By

Mr.RAHUL DIPAK SHELAR
ADPM/21/2847

DEPARTMENT OF EXTENSION EDUCATION
COLLEGE OF AGRICULTURE, DAPOLI

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NOVEMBER, 2023

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Under the Guidance of

Dr. S. S. DESHMUKH
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DECLARATION OF STUDENT

I hereby declare that the experimental work and its interpretation of the Thesis entitled **"Determining Farmers Intention towards Adoption of Organic Agricultural Practices using Structural Equation Modeling (SEM)"** or part thereof has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis/publication of any University or scientific organization. The source of materials used and all assistance received during the course of investigation have been duly acknowledged and that no part of the thesis has been submitted for any other degree or diploma.

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CERTIFICATE

This is to certify that the thesis entitled, **"Determining Farmers Intention towards Adoption of Organic Agricultural Practices using Structural Equation Modeling (SEM)"**submitted for the degree of M.Sc. (Agriculture) in Extension Education, of the College of Agriculture, Dr.BalasahebSawantKonkanKrishiVidyapeeth, Dapoli, is a bonafide research work carried out by **Mr. Rahul DipakShelar (ADPM/21/2847)** under my supervision and that no part of thesis has been submitted for any other degree. The student had completedall the course and research requirement as per the norms in regular mode and has submitted one research paper from his M. Sc. work.

The assistance and help received during the course of investigation have been fully acknowledged.

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THESIS APPROVAL BY THE STUDENT'S ADVISORYOMMITTEE INCLUDING EXTERNAL EXAMINER

This is to certify that the thesis entitled, **“Determining Farmers Intention towards Adoption of Organic Agricultural Practices using Structural Equation Modeling (SEM)”**submitted by **Mr. Rahul DipakShelar (ADPM/21/2847)**to the College of Agriculture, Dr.Balasaheb SawantKonkan Krishi Vidyapeeth, Dapoli, in partial fulfillment of the requirements for thedegree of M.Sc. (Agriculture)in Extension Education subject having Agricultural Economics and Agricultural Meteorology as minor subjects has been approved by Student’s AdvisoryCommittee, Board of Studies in Extension Education and Languages and evaluated by one ExternalExaminer after the open viva-voce examination in the presence of ExternalExaminerheld on dated / / .

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ABBREVATIONS

%	Per cent
σ	Standard Deviation
A.M	Arithmetic Mean
d.f.	Degree of freedom
et al.	And Others
etc.	etcetera
Ext. Edu.	Extension Education
f	Frequency
Fig	Figure
GI	Geographical Indication
H0	Null Hypothesis
H1	Alternate Hypothesis
ha	Hectare
i.e.	That is
J	Journal
Km	Kilo meter
N	Total no of
MT	Metric tons
No.	Number
S. D.	Standard Deviation
SEM	Structural Equation Modelling
Sl. No.	Serial Number
Std	Standard
TPB	Theory of Planned Behaviour
viz.	Namely
$\bar{x}$	Arithmetic mean
I	Intention
A	Attitude
SN	Subjective Norms
PBC	Perceived Behavioural Control
HC	Health consciousness
FSC	Food Security Concerns
M	Marketability
AVE	Average Variance Extracted

INTRODUCTION

CHAPTER I

INTRODUCTION

The agricultural sector is of paramount importance to the Indian economy, as it supports over half of the population and significantly contributes to the country's GDP. Despite the presence of challenges such as fragmented land holdings, inadequate infrastructure, and climate change, efforts are being made to modernize the sector, enhance farmer income, and promote sustainable agricultural practices. The Green Revolution, which commenced in the mid-1960s and introduced high-yielding varieties and improved agricultural technologies, transformed India from a food grain deficit to a surplus nation. This transformation had a considerable impact on the socio-economic landscape of rural agricultural communities and the country as a whole. However, the efficacy of the Green Revolution has diminished over time, and it has been criticized by social activists for its environmentally harmful use of inorganic fertilizers and chemical pesticides. The extensive use of inorganic inputs, such as chemical fertilizers, has significantly shaped the agricultural landscape in India. The extensive adoption of inorganic agricultural inputs has led to increased crop yields and enhanced agricultural productivity, by providing essential nutrients such as nitrogen, phosphorus, and potassium to address soil nutrient deficiencies and promote crop growth. However, the over-reliance on these inputs has raised concerns about long-term soil health and environmental sustainability. The excessive use of chemical fertilizers can contribute to soil degradation, water pollution, and negative impacts on biodiversity. To ensure a balanced and sustainable approach to agriculture, there is a growing emphasis on promoting integrated nutrient management, which incorporates organic practices and efficient use of inorganic inputs. Sustainable agricultural practices aim to optimize productivity while minimizing environmental impact, ensuring the long-term viability of India's agricultural sector.

Growing concerns about the environmental, food safety, and human health implications of synthetic agricultural chemicals have led to a significant shift towards organic farming among farmers and policymakers. This collective concern underscores the complex relationship between agricultural practices, environmental sustainability, and human well-being, highlighting the need for a more holistic and ecologically balanced approach to farming.

Organic farming: concept and status

Organic farming is a comprehensive system of production management that prioritizes the application of management practices over external inputs. This approach fosters the well-being of agro-ecosystems by promoting biodiversity, biological cycles, and soil biological activity. Organic farming boasts a rich historical tradition within the Indian agricultural system, representing a well-established concept rather than a recent innovation. It focuses on pest and disease control without resorting to synthetic pesticides or genetic manipulation. Its rising popularity among various agricultural systems can be attributed to the favorable environmental outcomes associated with organic practices. Organic farming minimizes or predominantly eliminates the utilization of synthetically compounded fertilizers, pesticides, growth regulators, genetically modified organisms, and additives in livestock feed. To the utmost degree feasible, organic farming systems hinge on practices such as crop rotations, the utilization of crop residues, animal manures, legumes, green manures, off-farm organic wastes, biofertilizers, mechanical cultivation, mineral-bearing rocks, and elements of biological control. These methods are employed to sustain soil productivity, preserve tilth, provide plant nutrients, and manage insects, weeds, and other pests.

The growing concerns about the use of chemical fertilizers and pesticides in India have led to an increasing significance of organic farming. Although genetically modified crops offer high yields, their long-term effects are yet to be tested, causing hesitation among people to trust such foods. Additionally, there is a rising global demand for organic food. Recognizing these factors, the Indian government has introduced the Paramparagat Krishi VikasYojana (PKVY), a key initiative under the Soil Health Card (SHC) scheme, which is part of the National Mission of Sustainable Agriculture (NMSA). PKVY aims to develop sustainable models of organic farming by combining traditional knowledge with modern science, with the objective of ensuring long-term soil fertility, resource conservation, and contributing to climate change adaptation and mitigation. The primary focus of PKVY is to enhance soil fertility and promote the production of healthy food through organic practices, without the use of agro-chemicals. Moreover, PKVY seeks to empower farmers by fostering institutional development through a cluster approach, covering farm practice management, input production, quality assurance, value addition, and direct marketing through innovative means.

India, a nation recognized for its agro-based economy, has experienced a significant upsurge in the organic farming movement, resulting in substantial growth in organic farming land, agricultural production, and market expansion. As per the FIBL & IFOAM Year Book (2022), India holds the 9^{th}position globally in terms of organic agricultural land and ranks first in the number of organic producers. India accounts for 30 per cent of the world's organic producers, with a cultivation area of 1.5 million hectares, equivalent to 2.59 per cent of the global organic cultivation area, as reported in the World of Organic Agriculture Report-2018. During the 2022-23 period, India achieved a notable production of approximately 3.49 million metric tons of organic foods. This diverse range of food products includes sugarcane, cotton, oilseeds, basmati rice, cereals, pulses, spices, tea, fruits, dry fruits, vegetables, coffee, their value-added products, as well as aromatic and medicinal plants.

Status of rice farmers in Konkan:

Rice is a predominant cereal crop globally and serves as a staple food for over half of the world's population. In the Konkan region of Maharashtra, approximately 4.01 lakh hectares are dedicated to a rice-based cropping system, reflecting the region's significant role in the cultivation of rice. The favorable climate and soil conditions in the Konkan region make it conducive for rice cultivation, and the production of rice has witnessed a commendable increase, reflecting advancements in agricultural practices and technology adoption. The number of rice growers in the Konkan region has also seen a positive trend, with a notable community of farmers actively engaged in rice cultivation. The adoption of modern agricultural techniques and government support programs has encouraged more individuals to participate in rice farming, contributing to the overall growth of the sector. Additionally, the rice-based cropping system in the Konkan region has evolved, incorporating sustainable practices and diversified cultivation methods. This not only enhances rice productivity but also promotes the overall resilience and sustainability of agriculture in the Konkan region. In this region, farmers adhere to five predominant cropping systems: rice-fallow land, rice-rice, rice-pulses, rice-oilseed, and rice-vegetables. Notably, many farmers in this area have embraced organic farming practices within these cropping systems. The characteristics of farmers engaged in this cropping system are outlined as follows:

Table 1: Characteristics of rice based cropping system.

Sr. No	Cropping system	Characteristics
1	Rice-Fallow land	Adopted by small-scale farmers with limited resources, subsistence farming employs a traditional approach, primarily reliant on family labor. These farmers, characterized as resource-poor and often considered laggards, engage in a traditional, sustenance-oriented style of agriculture.
2	Rice-Rice	Small and medium-sized landholders engage in intensive monocropping, generating a marketable surplus with the resources at their disposal. While farmers possess adequate resources, the farming practice proves to be less remunerative. This approach is adopted by the late majority or laggards in social system.
3	Rice-Pulses	Advocate for conservation agriculture to unlock its potential productivity, generate marketable surpluses, and encourage adoption by small to medium landholders, categorizing it within the late majority segment.
4	Rice-Oilseeds	Encourage the practice of conservation agriculture to unlock its potential for increased productivity, generate marketable surpluses, and facilitate adoption by small to medium-sized landholders within the late majority category.

Need of the study:

Given the extensive cultivation of rice-based crops in the Konkan region, covering approximately 4.01 lakh hectares, and the growing interest in organic farming practices among Indian farmers, it is crucial to understand the factors that drive farmers' intentions to adopt organic agricultural practices. The substantial demand for organic products, as evidenced by the global organic market, which reached $103.36 billion in 2021 (Organic Farming Global Market Report, 2022), underscores the economic significance of this shift. Farmers are realizing increased profits through the sale of premium prices for their organic produce, emphasizing the economic viability of organic farming.

In light of these circumstances, the research study titled "Determining Farmers' Intention towards Adoption of Organic Agricultural Practices" is of utmost importance. By employing Structural

Equation Model (SEM), the study aims to uncover the motivations and determinants that influence farmers' intentions to adopt organic agricultural practices. The study seeks to address critical questions, including farmers' perceptions of organic farming, the factors that influence their intentions, the specific organic practices employed in rice-based cropping systems, and the socio-economic and agro-ecological contexts that facilitate the adoption of organic agriculture. Additionally, the study aims to shed light on the marketing channels utilized by farmers to sell their organic farm produce, providing comprehensive insights for sustainable agricultural development in the region. Therefore, the current study aims to achieve the following specific objectives:

Objectives:

1. To study socio-economic, institutional and agro ecological characteristics of the organic farmers,
2. To study the adoption of prevailing organic agricultural practices in rice-based cropping systems,
3. To explore the determinants of farmers intention towards adoption of organic agricultural practices in rice-based cropping system,
4. To study the marketing channels utilized by the farmers while selling their organic farm produce.

Scope of the study:

The widespread cultivation of rice in the Konkan region, coupled with the growing trend of farmers towards organic farming practices, underscores the pressing need to comprehend the factors that influence farmers' intention to adopt organic agriculture, given the global market's demand that exceeded $103.36 billion in 2021.

In light of this context, the research study titled "Determining Farmers' Intention towards Adoption of Organic Agricultural Practices" holds immense significance. Utilizing the Structural Equation Model (SEM), the study endeavors to uncover the motivations and determinants that shape farmers' intentions towards adopting organic agricultural practices. Key inquiries include understanding farmers' perspectives on organic farming, identifying factors that influence their intentions, examining specific organic practices adopted in rice-based cropping systems, and analyzing the socio-economic and agro-ecological contexts that foster the adoption of organic agriculture.

The scope of the study also extends to a comprehensive investigation of the marketing channels used by farmers to sell their organic farm produce, offering insights crucial for sustainable agricultural development in the Konkan region of Maharashtra. By delving into the socio-economic, institutional, and agro-ecological characteristics of organic farmers, studying the adoption of prevailing organic agricultural practices, and investigating the determinants of farmers' intentions, the research aims to contribute valuable knowledge for informed decision-making and policy formulation. This study's significance transcends mere understanding of organic agriculture dynamics; it addresses the economic, environmental, and social implications, making it an indispensable initiative for promoting sustainable agricultural practices in the agriculturally vital Konkan region.

Limitation of the study:

The study entitled "Determining Farmers' Intention towards Adoption of Organic Agricultural Practices using Structural Equation Modelling" holds considerable significance. However, it is not without its limitations. One limitation is that the findings may not be generalizable beyond the Konkan region due to the diverse dynamics of organic farming adoption across various geographical and socio-cultural contexts. Another limitation is the reliance on Structural Equation Model (SEM), which has limitations in terms of data requirements and the assumption of linear relationships between variables, potentially overlooking nuances in farmers' decision-making processes.

Moreover, while the study's scope is comprehensive, it may not encompass all factors influencing farmers' intentions toward organic agriculture. External elements such as government policies, market fluctuations, and global economic trends, though significant, may not be exhaustively addressed. Additionally, obtaining accurate and up-to-date information on farmers' marketing channels may pose challenges, considering the evolving nature of these practices and potential seasonal variations.

Lastly, the study's focus on intentions may not necessarily reflect actual adoption behavior, as farmers' intentions might not always materialize into concrete actions due to unforeseen constraints or changing circumstances. Recognizing these limitations is crucial for an accurate interpretation of the study's findings and guiding future research to address gaps in understanding organic farming adoption in the Konkan region.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

Research is an interconnected and ongoing process that is fundamentally built upon the groundwork laid by previous investigations. Undertaking a comprehensive literature review is both crucial and indispensable before and after the commencement of empirical research. This critical phase enables the researcher to become fully immersed in the subject matter and to develop a deep comprehension of the research problem at hand. The literature review not only familiarizes the researcher with pertinent studies, but also provides invaluable insights into a range of concepts, theoretical underpinnings, and empirical outcomes. A careful and systematic examination of prior research studies and literature, which bear either direct or indirect relevance to the current investigation, has been rigorously carried out. The subsequent chapter meticulously presents the synthesized insights derived from the collective body of research, thereby adding to the intellectual discourse within the field.

2.1 Theory of planned behaviour: A theoretical framework

The Theory of Planned Behavior (TPB) is frequently utilized to emphasize the influence of psychological determinants on adoption intentions in the agricultural domain. The TPB has emerged as a prominent model among numerous theoretical perspectives that have been developed over the past few decades to elucidate the determinants of behavioral intention and usage behavior. Examples of these theoretical perspectives include the Theory of Reasoned Action, the Theory of Planned Behavior, the Innovations Diffusion Theory, and the Technology Acceptance Model. Studies across diverse contexts have consistently highlighted the significance of intention-based models in predicting usage behavior and identifying its drivers, thereby contributing valuable theoretical evidence and knowledge.

The TPB is a socio-psychological model designed to comprehend human behavioral intention and evaluate the transformation of these intentions into specific behaviors. According to Ajzen (1991; 2005), intentions in TPB are defined as "capturing the motivational factors influencing behavior; they indicate how much effort individuals are willing to exert in performing a behavior. Generally, stronger intentions correlate with a higher likelihood of behavior performance." The three psychological constructs constituting intention in TPB are attitude, subjective norms, and perceived behavioral control. Combining these three components creates a positive or negative intention toward conduct. Therefore, under more favorable circumstances for these constructs, the intention to act is typically considered strong.

According to TPB, subjective norms, perceived behavioral control, and attitude toward the activity are the three primary factors influencing farmers' intentions to adopt organic farming. Studies have shown that these factors play a significant role in determining the adoption of organic farming practices by farmers. For instance, Hall and Rhoades (2010) found that subjective norms had a positive impact on farmers' intentions to adopt organic farming practices. Similarly, Hattam (2006) found that perceived behavioral control was a significant predictor of farmers' intention to adopt organic farming practices. Läpple and Kelley (2013) also found that attitude toward organic farming was positively associated with farmers' intention to adopt organic farming practices. Other studies such as Mzoughi (2011) and Yanakittkul and Aungvar-avong (2019) have also highlighted the role of these factors in determining farmers' intentions to adopt organic farming practices.

Attitude (A):An individual's attitude is reflective of their beliefs regarding a person's behavior, determining whether these beliefs tend towards positivity or negativity. Consequently, those with positive attitudes are more likely to exhibit a stronger intention to adopt specific behaviors (Ajzen, 1991). Borges *et al.* (2016) identified a statistically significant positive relationship between farmers' attitudes and their intention to enhance natural grassland. Similarly, Deng *et al.* (2016), Jones *et al.* (2016), Sok*et al.* (2016), and Van Dijk*et al.* (2016) collectively affirmed that farmers' attitudes constitute a pivotal factor influencing their behavioral intentions. Therefore, the attitude of farmers emerges as a crucial element worthy of inclusion in the conceptual framework for the adoption of organic farming practices.

Subjective norms (SN):Subjective norm, a social factor, denotes the perceived social pressures to either engage or refrain from a specific behavior. Deng *et al.* (2016) found in their study that a farmer's conduct regarding payment for ecosystem services is significantly influenced by subjective norms, encompassing a neighbor's opinion, government policies, and the influence of family members. Dang *et al.* (2014) further identified a conforming influence group, revealing that subjective norms, along with the influence of friends, cousins, and neighbors, collectively impacted the group's behavior. Moreover, the perceived learning associated with subjective norms and group norms exerted an influence on the actions of smallholders (Fielding, Terry, Masser, and Hogg, 2008; Van Dijk et al., 2016). Therefore, subjective norms emerge as a crucial factor influencing farmers' adoption of organic farming practices.

Perceived behavioral control (PBC): In accordance with Ajzen (1991), the perception of ease or difficulty associated with performing a specific behavior is a crucial aspect of an individual's behavioral control. As Westaby (2005) noted, an individual's behavioral control is contingent upon their beliefs regarding the level of difficulty, danger, or challenge associated with the behavior. In a study conducted by Jones *et al.* (2016), the perceived behavior control of organic dairy farmers was examined in relation to their intentions to enhance herd health. Consequently, the concept of perceived behavior control is well-suited for investigating farmers' intentions in adopting the conceptual framework of organic farming, as established by Ajzen (1991), Westaby (2005), and Jones *et al.* (2016).

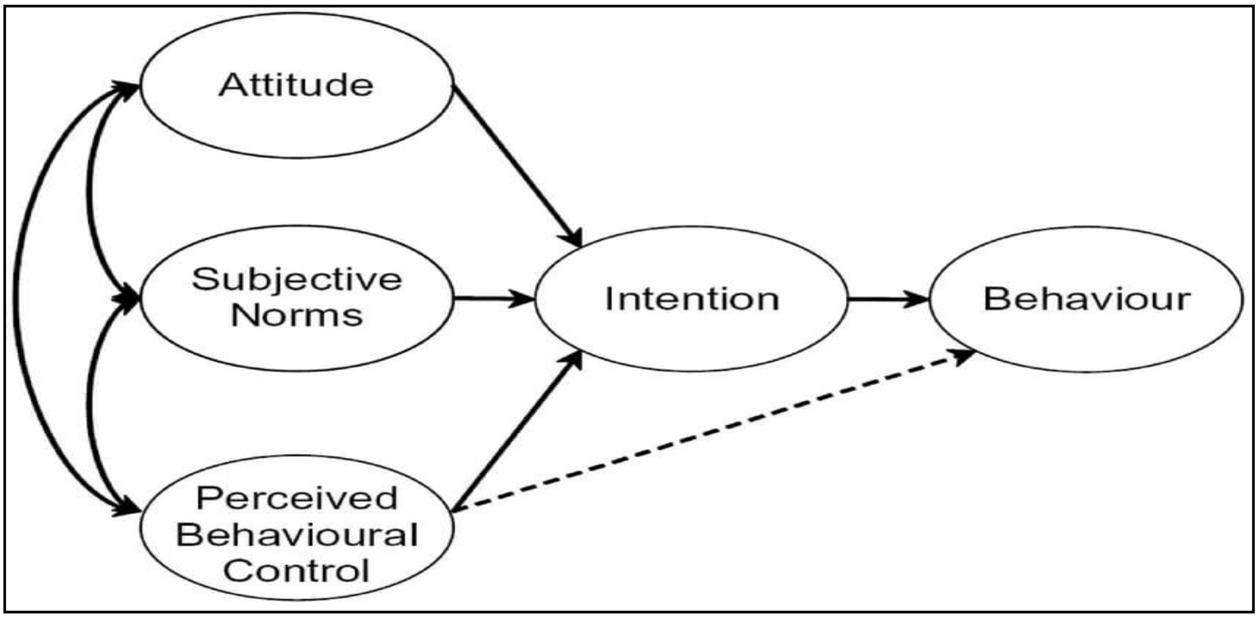


Figure 1: Original Theory of Planned Behaviour Proposed by Ajzen (1991)

The previous review identified three key components derived from the Theory of Planned Behavior (Ajzen, 1991) as instrumental in explaining farmers' behaviors. While the attitudes, subjective norms, and perceived behavioral control of farmers were found to be effective in elucidating their actions, they were insufficient in offering a comprehensive understanding of their intention to adopt organic farming practices. In light of this, the researcher suggests incorporating additional factors into the framework, including health consciousness, concerns about food security, and marketability

2.2 Extended Theory of Planned Behavior-added constructs for present study

Health consciousness (HC):In contemporary times, there has been a heightened emphasis on health consciousness and nutrient-rich diets. Consequently, an individual's health consciousness is likely to have a positive influence on their intentional behavior. Health consciousness, in this context, is defined as the extent to which an individual is aware of the healthiness of their diet and lifestyle.

Food security concern (FSC):Food security is a major concern for smallholder farmers, and it is defined as the extent to which an individual feels that they can produce adequate food through organic farming.

Marketability (M):The profitability of farming depends on market demand and consumer likeliness, and marketability refers to the degree of ease of sale of organic farm produce and earning the maximum possible premium profit.

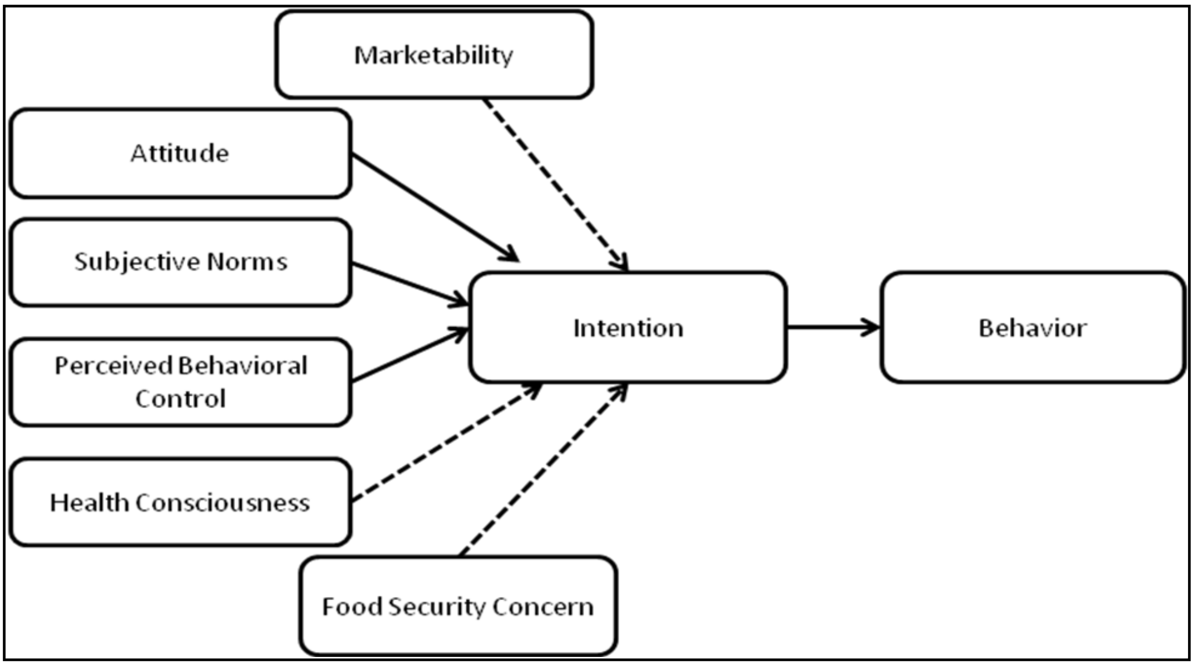


Figure 2: Proposed framework of Extended Theory of Planned Behaviour

2.3 Behavioral Dimensions of the Theory of Planned Behavior (TPB): A Concise Literature Review

2..3.1.BehaviouralAttitude

H1:The impact of Behavioural Attitude (BA) on farmers' intentions to adopt organic agricultural practices may be positive.

Ashari*et al.* (2016) and Ashari*et al.* (2018) both found that attitude had a significant and positive effect on the intention to adopt organic rice farming and behavioral intention, respectively.

Similarly, Jing Li *et al.* (2020), Joel Buyinza*et al.* (2020), Suneeporn*et al.* (2020), Imani*et al.* (2021), PhaibunYanakittkul andChuenjitAungvaravong (2020) all observed that farmers' attitudes played a critical role in shaping their intention to adopt sustainable agricultural practices, agroforestry, organic farming, and organic rice farming, respectively. These findings suggest that farmers' attitudes have a consistent and significant impact on their intention to adopt different agricultural innovations.

Therefore, it can be concluded that Behavioural Attitude (BA) has a positive influence on farmers' intention to adopt organic agriculture practices, as supported by the literature.

2.3.2 Subjective norms

H2: Subjective Norms (SN) may exert a positive influence on the intention of farmers to adopt organic agricultural practices.

According to Ashari*et al.* (2018), subjective norms have a positive and substantial effect on adoption intention.

Jing Li *et al.* (2020) observed that subjective norms significantly increase the adoption intentions of farmers towards sustainable agricultural practices, and Joel Buyinza*et al.* (2020) emphasized the positive influence of subjective norms on farmers' intentions to adopt agroforestry.

On the other hand, Imani*et al.* (2021) discovered that subjective norms did not significantly influence the intention of potato farmers to adopt organic farming.

Manideep and Reddy (2020) found that subjective norms did not significantly impact the intention to adopt organic farming.

However, Zhllima*et al.* (2021) noted a positive relationship between the adoption of organic farming and subjective norms.

Overall, the literature suggests that the impact of subjective norms on farmers' intentions to adopt agricultural technologies is nuanced, with mixed outcomes reported by various studies.

2.3.3 Perceived behavioral control

H3: The potential impact of Perceived Behavioural Control (PCB) on farmers' intentions to adopt organic agricultural practices may be positive.

Ashari*et al.* (2018) found a positive and significant effect of PBC on adoption intention, whereas Manideep and Reddy (2020) observed no significant impact of PBC on the intention to adopt organic farming.

Jing Li *et al.* (2020) noted a significant increase in farmers' adoption intentions toward sustainable agriculture practices due to PBC, while Joel Buyinza*et al.* (2020) emphasized a positive and significant influence of PBC on the intention to adopt agroforestry.

Imani*et al.* (2021) found that respondents' PBC significantly and positively influenced their intentions to engage in organic farming.

However, PhaibunYanakittkul and ChuenjitAungvaravong(2020) reported that the PBC of farmers was not statistically significant and only slightly impacted farmers' intentions to adopt organic farming in rice.

Zhllima*et al.* (2021) discovered a positive relationship between the adoption of organic farming and PBC.

The literature review reveals a mixed picture regarding the relationship between perceived behavioral control (PBC) and farmers' adoption intentions.The aforementioned studies highlight the context-dependent nature of the relationship between PBC and farmers' intentions. While some studies confirm a positive association, others suggest a lack of statistical significance or only a marginal impact. These inconsistencies emphasize the need for further investigation and a more nuanced understanding of how PBC interfaces with farmers' intentions in different agricultural settings.

2.3.4. Health consciousness

H4: The potential influence of health consciousness (HC) on farmers' intentions to adopt organic agricultural practices may be positive.

The inclusion of health consciousness within the Theory of Planned Behavior (TPB) constitutes a crucial element when investigating farmers' adoption intentions. Health consciousness, encompassing individuals' awareness and concern for their well-being, serves as a critical factor influencing decision-making in the context of farming. By integrating health consciousness into the TPB framework, researchers gain a comprehensive understanding of the determinants that shape farmers' intentions towards adopting organic agricultural practices.

Several studies have demonstrated the significance of health consciousness in driving farmers' decisions to adopt organic farming. Karki*et al.* (2011) observed that health consciousness acts as a determinant in farmers' choices to convert to organic production.

Similarly, Asadollahpour*et al.* (2016) found that the health factor significantly motivates farmers to adopt organic farming practices.

Cukur*et al.* (2019) identified health as the most crucial factor positively influencing farmers' intentions towards the adoption of organic farming.

Balla and Goswami (2022) revealed that farmers' health concerns have a substantial impact on the adoption of natural farming in their study, ‘Understanding the restrictions and motivations to adopt natural farming: a study on rice-growing farmers of Andhra Pradesh.'

These studies collectively indicate a robust relationship between health consciousness and farmers' decisions to adopt organic farming practices.

2.3.5. Food security concerns

H5: Food Security Concerns (FSC) may exert a positive impact on farmers' intentions to adopt organic agricultural practices.

Incorporating food security concerns into the TPB framework enhances the examination of farmers' adoption intentions, recognizing the intricate nature of their decision-making processes. This integration aligns research endeavors with overarching societal objectives pertaining to food security and sustainability, providing a more comprehensive understanding of the factors influencing farmers' choices in agricultural practices.

Chand *et al.* (2022) highlighted the prevalence of households experiencing inadequate food sufficiency, with 60 per cent of households lacking self-sufficiency for an entire year, and only 3 per cent being food self-sufficient for twelve months or more. This underscores the need to consider adoption intentions, especially in the context of organic agricultural practices. They provide a vital foundation for ongoing research and the formulation of strategies aimed at fostering adoption intentions conducive to achieving greater food self-sufficiency.

2.3.6. Marketability

H6: Marketability (MK) may exert a positive impact on farmers' inclination to adopt organic agricultural practices.

The marketability construct may be of paramount importance in evaluating the intention to adopt organic agricultural practices, as it reflects the perceived demand and economic viability of organic products in the market. Farmers' consideration of marketability can serve as a significant determinant, influencing their intention to adopt organic practices, as it directly impacts their potential returns and economic sustainability. Gaining insights into the marketability aspect provides valuable practical feasibility and success of organic agricultural adoption.

Alexopoulos*et al.* (2010) discovered that farmers' primary reasons for engaging in organic farming included favorable prices and secure market conditions for organic produce, accounting for 74.4 per cent and 61.3 per cent, respectively.

Uhunamure*et al.* (2021) further found that smallholder farmers base their decision to adopt organic farming on the belief that premium prices reflect the product's quality and influence the choice of marketing channels for trading their produce.

Consequently, the synthesis of the above literature suggests that economic incentives, such as favorable prices and perceived product quality, are central drivers influencing farmers' decisions to transition to organic agriculture. The amalgamation of these findings underscores the importance of economic factors in shaping farmers' behavior towards organic farming adoption.

This study has developed hypotheses concerning additional constructs incorporated into the original Theory of Planned Behavior, which are empirically tested in the results section. The proposed hypotheses are outlined below.

Hypothesis (H7): The potential impact of Food Security Concerns (FSC) on farmers' attitudes towards adopting organic agriculture practices could be favorable.

Hypothesis (H8):Marketability may exert a positive impact on farmers' inclination towards adopting organic agricultural practices.

Hypothesis (H9):Marketability may exert a positive impact on the subjective norms related to the adoption of organic farming.

It is anticipated that a latent construct will serve as a mediator, elucidating the relationship between the two variables. Keeping this in mind, the following hypothesis is posited to examine and substantiate the role of mediators in elucidating the intentional connection between the chosen constructs.

Hypothesis (H10): The role of attitude may serve as an intermediary between food security concerns and intentions.

Hypothesis (H11): The role of attitude may serve as an intervening factor in the connection between marketability and intention.

Hypothesis (H12):Subjective norms may prove to be a mediating factor in the relationship between marketability and intention.

The twelve hypotheses in question were subjected to empirical validation through the application of structural equation modeling (SEM), a sophisticated statistical method that facilitates an extensive examination of the proposed relationships and enables the evaluation of the postulated structural paths within the research framework. The utilization of SEM allows for a thorough investigation of the interconnections among the variables, presenting a robust and systematic approach to verify the theoretical constructs and their relationships within the context of the study. The results of the empirical testing using SEM will provide invaluable insights into the understanding of the factors influencing farmers' intentions and behaviors in the adoption of organic agricultural practices.

2.4 Socio-economic, institutional and agroecological characteristics of farmers

2.4.1 Age

Age serves as a crucial variable in the examination and investigation of diverse phenomena, with its significance notably amplified in the realm of agricultural practices, particularly in the context of implementing organic farming.

Several studies have highlighted the age distribution of farmers who adopt organic farming practices. According to BinodKafle (2011), approximately 72 per cent of farmers who adopted organic farming were below the age of '50' years.

Alzaidi*et al.* (2013) observed that about 95.3 per cent of the respondents were above the age of '30' years.

Ubokudom*et al.* (2016) revealed that 27.53 per cent of organic farmers fell within the age range of '31 to 40' years, while 38.12 per cent were within the age range of '41 to 50' years, 22.22 per cent were above the age of '50' years, and 12.12 per cent were below the age of '30' years.Similarly, Ali Shams *et al.* (2017) indicated that the majority of farmers belong to the 'middle' age group.

Issa and Hamm (2017) discovered that farmers falling within the age range of '40–60' years constituted over 50 per cent of those who adopted organic farming methods.

Wijaya*et al.* (2018) identified that the majority of farmers, about 58 per cent, adopted organic farmingfrom the '40-50' age group, while 21 per cent from the '30-40' age group, 18 per cent from 'above 50', and 3 per cent 'below 30' age group adopted organic farming.

Moreover, Mithun Kumar Ghosh*et al.* (2019) noticed that about 70 per cent of farmers fell into the category of the 'middle' age group.

Tanweer Ahmed (2019) reported that approximately 54.17 per cent of organic farmers were within the 'middle' age bracket, followed by the 'young' age group at 25.83 per cent, and the 'old' age group at 20.00 per cent.

NishaYadav (2020) found that 48.33 per cent of the organic respondents were within the age bracket of 25-50 years, with 30.00 per cent falling within the 'above 50 years' category, and 21.67 per cent within the 'up to 25 years' category.

PriyankaIngale (2020) discovered that 56.00 per cent of respondents were within the 'middle' age group.

Singh (2020) found that 74.16 per cent of respondents fell within the 'middle' age group (35-55 years), with 16.25 per cent falling within the 'old' age group (56 and above), and only 9.58 per cent within the 'young' age group (up to 34).

Singh and Sharma (2020) discovered that 55.0 per cent of organic farmers who use organic farming methods fall within the 'middle-aged' category, with 23.8 per cent falling within the 'younger' category, and 7.5 per cent falling within the 'older' category.

Nandwani*et al.* (2021) revealed that 67.56 per cent of farmers belong to the 'middle' age group, followed by 29.72 per cent within the 'young' age group, and 2.70 per cent of farmers were 'above 50 years'.

According to Imani*et al.* (2021), 49 per cent of farmers engaged in organic potato production were found to belong to the age category of 30-45 years, while 38.5 per cent were aged more than 45 years, and 12.5 per cent were younger than 30 years.

In contrast, Falola and Mukaila (2022) reported that 41.66 per cent of farmers were within the age group of 31-40 years, 24.17 per cent within 41-50 years, 20 per cent within 51-60 years, and 14.17 per cent within 21-30 years.

The synthesis of existing literature suggests a consistent pattern in the age demographics of farmers adopting organic farming practices. In various studies conducted by different researchers, a significant proportion of farmers fall within the middle-age category. This trend may be attributed to a range of factors, including experience, financial stability, and awareness. While both younger and older individuals contribute to the adoption of organic practices, the middle-age group appears to be the primary demographic.These studies highlight the importance of age in the adoption of organic farming practices and provide insights into the demographic characteristics of farmers who adopt these practices.

2.2.2. Education

Education serves a vital function in the exploration and comprehension of the adoption dynamics of organic agriculture. Farmer education levels directly impact their ability to access and appreciate information related to organic agricultural practices, ecological benefits, and market opportunities associated with organic farming.

Several studies have highlighted the connection between farmers' educational attainment and their adoption of organic farming practices. Patidar and Patidar (2015) discovered that 34.0 per cent of farmers had completed 'high' school, with 57.00 per cent completing only this level of education. Additionally, 7.00 per cent had obtained an 'undergraduate' degree, and only 2.00 per cent had completed a 'graduate' degree.

Ubokudom*et al.* (2016) found that 63.63 per cent of farmers practicing organic farming had completed their 'primary' education, 22.22 per cent had finished 'secondary' school, 12.12 per cent had earned an 'ordinary national diploma', and 2.02 per cent had earned a 'bachelor's' degree.

Azam and Shaheen (2018) observed that 40.5 per cent of farmers completed their 'secondary' education, 24 per cent completed their 'primary' education, 16.5 per cent completed their 'graduation', 13 per cent were 'illiterate', and 6 per cent completed 'post-graduation'.

Cukur*et al.* (2019) reported that 53.70 per cent of the sample population had attained 'elementary' school education, 16.67 per cent had 'middle' school education, 12.96 per cent had 'high' school education, 11.11 per cent had 'university' education, 3.70 per cent were 'literate', and 1.86 per centwere 'illiterate'.

Ghosh*et al.* (2019) found that 45 per cent of the respondents were 'illiterate', 42.5 per cent had completed 'primary' education, and 12.5 per cent had completed 'secondary' education.

Ahmed (2019) revealed that 29.16 per cent of organic farmers had 'graduate' level education, 26.66 per cent were 'illiterate', 20.00 per cent had 'high' school education, 12.50 per cent had 'Pre-University' education, and 5.83 per cent had 'primary' school education and 'post-graduation'.

AyseGulTuncer (2017) noted that 50 per cent of farmers with organic farming practices had completed 'elementary' school education.

NishaYadav (2020) found that 36.67 per cent of organic respondents had education up to 'senior secondary' and above, 25.00 per cent had education up to 'high' school, 23.33 per cent had education up to 'middle' school, and 15.00 per cent were 'illiterate'.

PriyankaIngale (2020) revealed that 27.00 per cent of respondents had only completed their 'primary' education, while 38.00 per cent had completed their 'secondary' education.

Singh *et al.* (2016) reported that 41.90 per cent having completed 'intermediate' education, 17.91 per cent 'high school,' 16.19 per cent 'middle school,' 14.76 per cent possessing a 'graduate' or 'postgraduate' degree, and 9.52 per cent having education up to 'primary' school level.

Singh and Sharma (2020) also reported that 44.8 per cent of farmers who adopted organic agriculture had finished their 'primary' school education.

Imani*et al.* (2021) found that 49.5 per cent of respondents had completed 'elementary' education, while 23 per cent of farmers had finished 'secondary' school, 14.5 per cent had finished 'high' school, and 13 per cent of farmers were 'illiterate.'

Nandwani*et al.* (2021) revealed that 78.38 per cent of farmers completed their 'high' school education, 10.8 per cent completed 'post-graduation,' 5.41 per cent completed 'technical' school degree, and 2.70 per cent completed education up to 'graduation.'

Abraham Falola and RidwanMukaila (2022) noticed that 53.33 per cent of farmers completed 'secondary' education, 28.33 per cent completed 'tertiary' education, 15 per cent completed 'primary' education, and only 3.33 per cent had no formal education.

Chand *et al.* (2022) showed that 31 per cent of the respondents had '9-12' years of schooling, 29 per cent had '1-8' years of schooling, 16 per cent had '12-16' years of schooling, and 24 per cent of the respondents were found to be 'illiterate.'

The consolidation of these investigations highlights the extensive range of educational foundations present within the organic farming community. Spanning from fundamental to advanced educational attainments, the farmers engaged in organic agriculture exhibit an extensive array of educational experiences. This assortment underscores the comprehensive nature of organic farming, demonstrating how individuals with various degrees of formal education actively participate in the adoption and execution of organic agricultural techniques.

2.2.3. Area under organic agriculture:

The incorporation of land dedicated to organic agriculture as a variable in adoption studies is of utmost importance for grasping the extent and consequences of organic farming practices. It offers valuable insights into the scale of land devoted to organic methods, which in turn influences the assessment of ecological, economic, and social implications of widespread adoption.

According to Singh *et al.* (2016), 33.34 per cent of respondents possessed less than 2 acres, 51.00 per cent had 2 to 3 acres, and 23.00 per cent had 3 to 4 acres of land for organic agriculture.

Patidar and Patidar (2015) reported that 55.00 per cent of farmers had '0-5 acres,' 15.00 per cent had '5-20 acres,' 49.00 per cent had '21-50 acres,' and 31.00 per cent had 'more than 50 acres' of land holdings.

PriyankaIngale (2020) revealed that 38.00 per cent of respondents had small land holdings, and 26.00 per cent were in the marginal landholding category.

The aforementioned literature demonstrates the extensive range of land holdings in organic agriculture, from small to substantial operations. The prevalence of small and marginal landholdings in these studies emphasizes the inclusive nature of organic farming, highlighting the active participation of individuals with varying sizes of land.

2.2.4 Farming income:

Farm income plays a vital role in adoption studies as it directly impacts the economic well-being of farmers and their ability to invest in and sustain new agricultural practices. Understanding the distribution and levels of farm income offers valuable insights into the financial dynamics that shape the adoption of innovative and organic farming methods.

According to Cukur*et al.* (2019), the majority of farmers, comprising 77.78 per cent, were categorized as middle-income earners, while 14.81 per cent fell into the low-income group and 7.41 per cent were classified as high-income individuals.

NishaYadav (2020) found that 45 per cent of organic respondents earned high incomes (above Rs 6,00,001), and 28.34 per cent fell into the medium-income bracket (Rs 3,00,001 to Rs 6,00,000). Additionally, 26.66 per cent of organic respondents earned low incomes (up to Rs 3,00,000).

Nguyen *et al.* (2021) revealed a distribution of farmer incomes, with 30.19 per cent earning between 15K to 25K USD, 22.01 per cent falling within the 10K to 15K USD range, and 17.92 per cent having incomes over 25K USD. Furthermore, 16.98 per cent had incomes ranging from 5K to 10K USD, while 12.90 per cent earned under 5K USD.

PriyankaIngale (2020) indicated that the majority of respondents (78.00 per cent) belonged to the high-medium income category, followed by 14.0 per cent in the high-income category, and only 8.00 per cent fell into the low-income category.

According to Singh*et al.* (2016), 63.33 per cent of respondents reported annual incomes ranging from Rs. 93,624 to Rs. 295,483, while 18.75 per cent and 17.91 per cent fell into the income ranges of Rs. 295,484 and above, and up to Rs. 93,623, respectively.

Singh and Sharma (2020) found that 78.3 per cent of farmers reported farming incomes between Rs. 50,000 and Rs. 110,000, with 17.5 per cent reporting incomes above Rs. 100,000. Zhou and Ding (2022) revealed income distribution among farmers, with 33.01 per cent earning 15K to 25K ¥, 20.26 per cent having 25K to 45K ¥ income, 19.28 per cent earning above 45K ¥, 17.32 per cent having 8K to 15K ¥ income, and 10.13 per cent having income below 8K ¥.

The synthesis of these studies underscores the importance of farm income in shaping the adoption of organic agricultural practices. The majority of farmers across different regions and currencies fall within middle to high-income categories, indicating their potential economic capacity to invest in innovative farming methods. It is essential to understand and address the diversity of income distribution to develop effective policies and interventions to encourage widespread adoption of organic agricultural practices.

2.2.5. Experience in organic farming:

Experience in organic farming holds significant importance in adoption studies, as it reflects practical knowledge, expertise, and the ability to navigate organic agricultural practices. Farmers with extensive experience are likely to contribute valuable insights into the challenges and benefits of organic methods, thereby influencing adoption patterns and decision-making.

Adeosope*et al.* (2012) revealed that 56.7 per cent of farmers possessed '6 to 10' years of experience in organic farming.

AkkamahadeviNaik (2016) reported that the majority of respondents (54.20 per cent) had 'low' farming experience, followed by 'medium' (40.80 per cent) and 'high' farming experience (5.00 per cent).

Prasanth (2016) indicated that the majority (47.50 per cent) of organic rice farmers had 'medium' levels of farming experience, followed by 'low' (32.50 per cent) and 'high' levels (20.00 per cent).

Wijaya*et al.* (2018) identified that the majority of about 76 per cent of farmers had '3-5' years of experience in organic farming, followed by 26 per cent with 'more than 5' years of experience.

Cukur*et al.* (2019) determined that most farmers (92.59 per cent) had '0-5' years of experience in organic farming, while 5.56 per cent had '6-10' years, and 1.85 per cent had '11-20' years.

Takagi *et al.* (2021) found that 36 per cent of farmers possessed '11-15' years of experience, while 31 per cent had experience in the range of '6-10' years. Additionally, 26 per cent had 'more than 16' years of organic farming experience, and 24 per cent of farmers had '0-5' years of experience.

NishaYadav's (2020) research findings indicated that the majority of respondents (53.33 per cent) had been involved in organic farming for 'more than 3' years, followed by those with two to three years of experience (20 per cent), less than one year (15 per cent), and one to two years (11.67 per cent).

Similarly, Nguyen et al.'s (2021) study disclosed that 29.25 per cent of the respondents had '11-15' years of experience, 26.73 per cent had '6-10' years of experience, 23.90 per cent had experience exceeding '15' years, 11 per cent had '1-5' years of experience, and 9.12 per cent had less than '1' year.

PriyankaIngale's (2020) research findings revealed that the majority of respondents (69.0 per cent) had 'three to five' years of experience in organic farming. Additionally, 27.00 per cent of respondents reported having 'more than five' years of experience, while only 4 per cent had 'less than two' years of experience in organic farming.

The cumulation of past research findings on farmers' experience in organic farming highlights a diverse range of durations. The majority of respondents in these studies exhibit 'medium' to 'low' levels of experience, predominantly engaging in organic farming for 'three to five' years. This diversity underscores the dynamic nature of organic farming adoption, encompassing individuals with varying durations of engagement.

2.2.6. Access to extension organisation:

Access to extension services is a vital element in bridging the gap between scientific advancements and practical application, enabling farmers to make informed decisions that lead to improved agricultural outcomes.

Nunoo*et al.* (2015) found that farmers' access to extension services had a significant impact on their decision to adopt organic cocoa farming.

Djokoto*et al.* (2016) reported that 84 per cent of conventional cocoa farmers had access to extension services.

Abdulai*et al.* (2018) discovered a positive and significant effect of access to agricultural extension services on the adoption of rice cultivation technologies.

Bui and Nguyen (2020) found that access to extension services positively impacted the adoption of organic farming methods.

Falola and Mukaila (2022) observed that access to agricultural extension services plays a crucial role in influencing farmers to adopt organic farming.

These studies consistently demonstrate the positive and significant role of access to extension services in influencing farmers' decisions to adopt organic farming practices across different agricultural contexts, including cocoa, rice cultivation, and organic farming. Therefore, expanding and fostering access to extension services should be a key focus in agricultural development strategies to encourage widespread adoption of organic farming practices.

2.2.7. Credit accessibility

Several studies have investigated the relationship between credit accessibility and adoption in diverse contexts.

Sarkar*et al.* (2013) found a significant positive correlation between adoption rates and access to credit.

Djokoto*et al.* (2016) reported that 32 per cent of farmers have access to credit facilities, emphasizing the importance of credit in the agricultural sector.

Similarly, Samarpitha*et al.* (2016) highlighted that a substantial majority (81.11 per cent) of farmers have access to institutional credit, underscoring the prevalence of credit accessibility in supporting agricultural activities.

Nguyen KhanhDoanh*et al.* (2018) found that among adopters, 61.13 per cent of households had access to credit, compared to 47.35 per cent among non-adopters, suggesting a positive association between adoption and credit accessibility.

Cavite *et al.* (2023) discovered a significant impact of credit access on farmers' adoption intention, further emphasizing the role of credit in influencing agricultural practices.

Umar *et al.* (2019) provided insights into the distribution of loan amounts, revealing that a majority (51.7 per cent) received loans between N100,000 and N300,000 under the Anchor Borrowers Programme.

Bui and Nguyen (2021) contribute to the literature by revealing a positive impact of credit access on the adoption of organic farming methods, indicating the broader implications of credit in promoting sustainable agricultural practices.

Jagtap (2022) found that 79.16 per cent of the respondents had a crop loan, reinforcing the prevalence of credit utilization in the agricultural sector.

These studies collectively suggest that credit accessibility is positively correlated with adoption, impacting farmers' intentions, and facilitating the adoption of organic farming methods. These findings underscore the importance of credit policies and programs in promoting agricultural development and innovation.

2.2.8. Access to crop insurance

The literature on crop insurance has revealed various patterns in access, premiums, and perceptions across different insurance schemes.

Swain (2015) reported that Non-Indexed Agricultural Insurance Schemes (NIAS) had higher per-hectare sums assured, premiums paid, and claims received than Weather-Based Crop Insurance Schemes (WBCIS).

On the other hand, Dey and Maitra (2017) demonstrated that under the PradhanMantriFasalBhimaYojana (PMFBY), an increase in claim payouts positively influenced farmer coverage. However, for WBCIS, farmer coverage was significantly influenced by subsidy and actuarial premium rates.

Ankrah*et al.* (2021) highlighted the adoption of agricultural insurance, showing that only 14 per cent of smallholder farmers had access to and accepted such insurance. Interestingly, 90 per cent of respondents acknowledged the usefulness of agricultural insurance as a mechanism for managing agricultural risks.

Jagtap (2022) findings revealed a significant difference in access to crop insurance schemes. A majority (62.5 per cent) of respondents had access to the PradhanMantriFasalBhimaYojana, while only 37.5 per cent had access to other schemes. This discrepancy suggests variations in the outreach and effectiveness of different crop insurance programs.

In conclusion, the literature underscores the intricate dynamics of crop insurance, with factors such as the type of scheme, claim payouts, subsidies, and perceived usefulness influencing farmers' participation. The higher access and acceptance observed under PMFBY indicate its potential effectiveness, while the disparities in access among respondents highlight the need for further research and targeted interventions to enhance the reach and impact of crop insurance schemes.

2.2.9. Social media accessibility

A study conducted by Rana and Singh (2014) found that a significant portion of respondents, amounting to 83.33 per cent, utilized social networking sites for various purposes, such as acquiring new knowledge, staying informed on news, and networking. Notably, nearly two-thirds of the participants expressed a preference for using social networking sites as a learning platform, with 44.60 per cent indicating that they utilized these platforms to improve their language skills.

Soni (2016) revealed that 94.00 per cent of respondents reported using Wikipedia for educational purposes, underscoring its prominence as an educational resource. YouTube was also identified as a significant platform, with 84.00 per cent of respondents acknowledging its educational value. Facebook, recommended by half of the respondents, emerged as a noteworthy educational tool, followed closely by SlideShare, endorsed by 48.67 per cent of participants. Additionally, 36.00 per cent of respondents recommended WhatsApp, while ResearchGate and Academia.edu received recommendations from approximately 36.00 per cent and 28.00 per cent of participants, respectively.

Jagtap (2022) shed light on the social media accessibility of mango growers, revealing that the majority (55.84 per cent) fell into the "medium" category. Conversely, only 27.5 per cent and 16.66 per cent of respondents were classified as having "low" and "high" social media accessibility, respectively.

A review of the literature indicates that social networking sites serve a multifaceted role, acting as platforms for learning, knowledge acquisition, and skill development. The popularity of specific platforms such as Wikipedia, YouTube, and Facebook for educational purposes highlights the diverse ways individuals utilize social media for learning and information dissemination.

2.2.10. Topography

The success of organic farming is depended on the topography of the land, as it determines the drainage patterns and soil characteristics that are critical for organic agriculture. Therefore, it is essential to take the topography into account when adopting organic farming practices.

In a study conducted by Ambali*et al.* (2021), it was discovered that the majority of participants (83.8 per cent) were involved in rice cultivation, either in rain-fed lowland or upland production systems.

Similarly, Tegegne*et al.* (2021) reported that 87 per cent of farmers were involved in upland rice cultivation.

Xiaoling Li and Xianrong Wu (2021) also discovered that 52.67 per cent of farmers chose plain land for rice cultivation, while 47.33 per cent opted for non-plain land.

The literature suggests that a large number of farmers across these studies are actively involved in rice cultivation, with a significant focus on upland production systems. The preference for plain or non-plain land varies among farmers, highlighting the diversity in cultivation practices.

2.2.11. Soil type

In a study conducted by Salam *et al.* (2021), it was discovered that the use of organic fertilizer resulted in a 13 per cent and 18 per cent rise in yield for clay-loam and sandy-loam soils, respectively, compared to the use of sandy soil. Conversely, for those who did not use organic fertilizer, the yield was 12 per cent and 15 per cent higher for clay-loam and sandy-loam soils, respectively.

2.2.12. Age of organic farm

The age of an organic farm is a crucial variable in adoption studies as it provides insights into the sustainability and long-term commitment of farmers to organic practices.

The study conducted by Taylor *et al.* (2022) revealed a diverse distribution of farm ownership durations among participants. It was observed that 36.9 per cent of farm owners had been actively managing their farms for 10-19 years, while 35.7 per cent had been operating for over 20 years, and 27.4 per cent had a decade-long tenure.

The findings suggest a diverse distribution of farm ownership durations among participants.

2.2.13. On site input production

The on-site input production is crucial in organic farming as it enhances self-sufficiency, minimizes external dependencies, and fosters sustainability by promoting locally sourced inputs.

Hattam and Holloway (2005) asserted that active participation in generating one's inputs exerts a substantial influence on the embrace of organic farming practices.

In nutshell, self-production of inputs emerges as a key factor driving the adoption of organic farming.

2.2.14. Livestock possession

The inclusion of livestock in organic farming is crucial for sustainable nutrient cycling and the provision of natural fertilizers, as well as enhancing overall farm resilience through eco-friendly and integrated agricultural practices. This approach fosters a holistic and self-sustaining method of organic farming.

Sasidharan (2015) reported that 45 per cent of vegetable growers had a high level of livestock ownership, while only 13 per cent had a low level.

According to Monikha (2016), 43.33 per cent of respondents indicated a medium level of livestock possession, with 32.22 per cent and 24.45 per cent of respondents reporting low and high levels, respectively. Organic farming certified farmers saw domesticated animals as a valuable component of their techniques.

Ahmed (2019) revealed that 62.5 per cent of organic farmers belonged to the high category of livestock possession, 20.83 per cent to the medium category, and 16.67 per cent to the low category.

NishaYadav (2020) found that 35 per cent of organic respondents had no animals, 35 per cent had up to 2 animals, and 30 per cent had more than 2 animals.

The ownership of livestock varies among farmers, with studies showing high levels among vegetable growers, mixed possession levels among respondents, a substantial portion of organic farmers possessing high levels of livestock, and diverse ownership patterns among organic respondents.

2.3. Adoptionof existing organic agricultural practices in rice-based cropping systems

In a study conducted by Adesope*et al.* (2012), it was reported that over two-thirds of organic farmers surveyed primarily employed crop rotation and mixed cropping. Additionally, 50 per cent of these farmers utilized intercropping, 58.9 per cent practiced slash-and-burn farming, and 63.3 per cent engaged in hoeing and hand weeding. Furthermore, a significant percentage of farmers incorporated organic manures, compost, and leaves as mulching materials.

In another study by Naik*et al.* (2012), it was observed that farmers used biopesticides, with neem seed cake and farmyard manure being employed during transplanting to control nematodes and root grubs.

Motiwale (2017) found that 55.56 per cent of respondents had a medium level of adoption of organic farming practices, while 32.22 per cent had a low level and 12.22 per cent had a high level of adoption.

MasudParvez*et al.* (2018) revealed that 52.9 per cent of respondents had a medium level of adoption of organic vegetable farming, while 25.5 per cent had a low level and 21.6 per cent had a high level of adoption.

Ahmed (2019) disclosed that 58.33 per cent of respondents belonged to the high adoption category, followed by 24.17 per cent in the low category and 17.50 per cent in the medium category for overall adoption of organic farming practices.

In a study by Malviya*et al.* (2020) on 100 organic farmers in Madhya Pradesh, it was found that 56 per cent had a medium level of adoption, 31 per cent had a low level, and 13 per cent had a high level of adoption regarding organic farming practices.

NishaYadav (2020) pointed that majority of organic farmers (46.67 per cent) had a low adoption level of organic farming, followed by 36.67 per cent with a medium level and 16.66 per cent with a high level of adoption.

Similarly, Bakar*et al.* (2021) reported that 49.7 per cent of farmers had a medium level of adoption of organic farming practices, while 47 per cent had a low level and only 3.3 per cent had a high level of adoption.

The literature reveals a diverse range of adoption levels among farmers regarding organic farming practices. While some studies report a predominant medium adoption level, others highlight a significant proportion of farmers with low or high adoption levels. This variability could be attributed to regional differences, socio-economic factors, or the specific focus of each study.

2.4. Marketing channels utilized by organic farmers

Effective marketing channels are crucial for farmers engaged in organic agriculture, as they ensure the efficient delivery of their produce to consumers while adhering to the principles of organic farming. The utilization of well-established channels leads to increased visibility, promotes sustainable practices, and fosters consumer trust within the organic farming industry.

Azam and Banumathi (2015) reported that a majority of farmers, constituting 51.3 per cent, sold their produce to village traders, while 47.5 per cent opted for city/town traders, and only a small fraction, amounting to 1.3 per cent, sold directly to consumers.

Raahinipriya and Jansi Rani (2018) noted that 57.7 per cent of farmers sold their produce to local merchants, 18.89 per cent to wholesalers, 17.77 per cent to commission mandis, and 5.56 per cent to contractors.

Ruaykijakarn*et al.* (2018) discovered that 70 per cent of produce was sold through organizations, 20 per cent in home and local markets, 5 per cent through online and social media, and the remaining 5 per cent in tourist destinations.

Sivaraj*et al.* (2017) revealed diverse selling patterns: 37.22 per cent for primary merchants, 25.56 per cent for commission agents, 19.45 per cent through wholesale markets, 6.11 per cent through regulated markets, 5.55 per cent directly to hotels, 5.00 per cent through supermarket chains, and 1.11 per cent to cooperative societies.

Ahmed (2019) found that 59.16 per cent of organic farmers sold through middlemen, 47.50 per cent through organic farmers associations, 42.50 per cent in local markets, 33.33 per cent to HOPCOMS, 29.16 per cent to exclusive organic stores, 23.33 per cent to supermarkets, and 21.66 per cent directly to consumers.

The diverse selling patterns observed among farmers highlight the need for a nuanced understanding of agricultural marketing channels, ranging from traditional traders and markets to emerging avenues such as online platforms and exclusive organic stores.

METHODOLOGY

CHAPTER III

METHODOLOGY

The chapter devoted to research methodology serves as the foundation of any scholarly investigation, providing a systematic and comprehensive framework that guides the study. This chapter elucidates the philosophical underpinnings and rationale of the chosen approach, ensuring transparency and rigor throughout the research process. A critical aspect of this chapter involves the description and justification of the research design, including the selection of data collection methods, sampling techniques, and data analysis tools. Additionally, the chapter delves into the ethical considerations that govern the study, emphasizing the researcher's commitment to maintaining the integrity and confidentiality of the gathered information. By offering a comprehensive account of the methodology, the chapter establishes the credibility of the research and enables readers and fellow scholars to reproduce and validate the study's findings. In essence, the methodology chapter serves as an indispensable link between the research questions posed and the empirical evidence gathered, shaping the trajectory of the entire research endeavor. The subsequent sections detail the methodological particulars.

3.1 Locale of the study

3.2 Research design

3.3 Sampling technique

3.4 Quantification of socio-economic, institutional and agroecological characteristics

3.5 Theory of planned behaviour: Constructs and their measurement

3.6 Tools of data collection

3.7 Statistical analysis

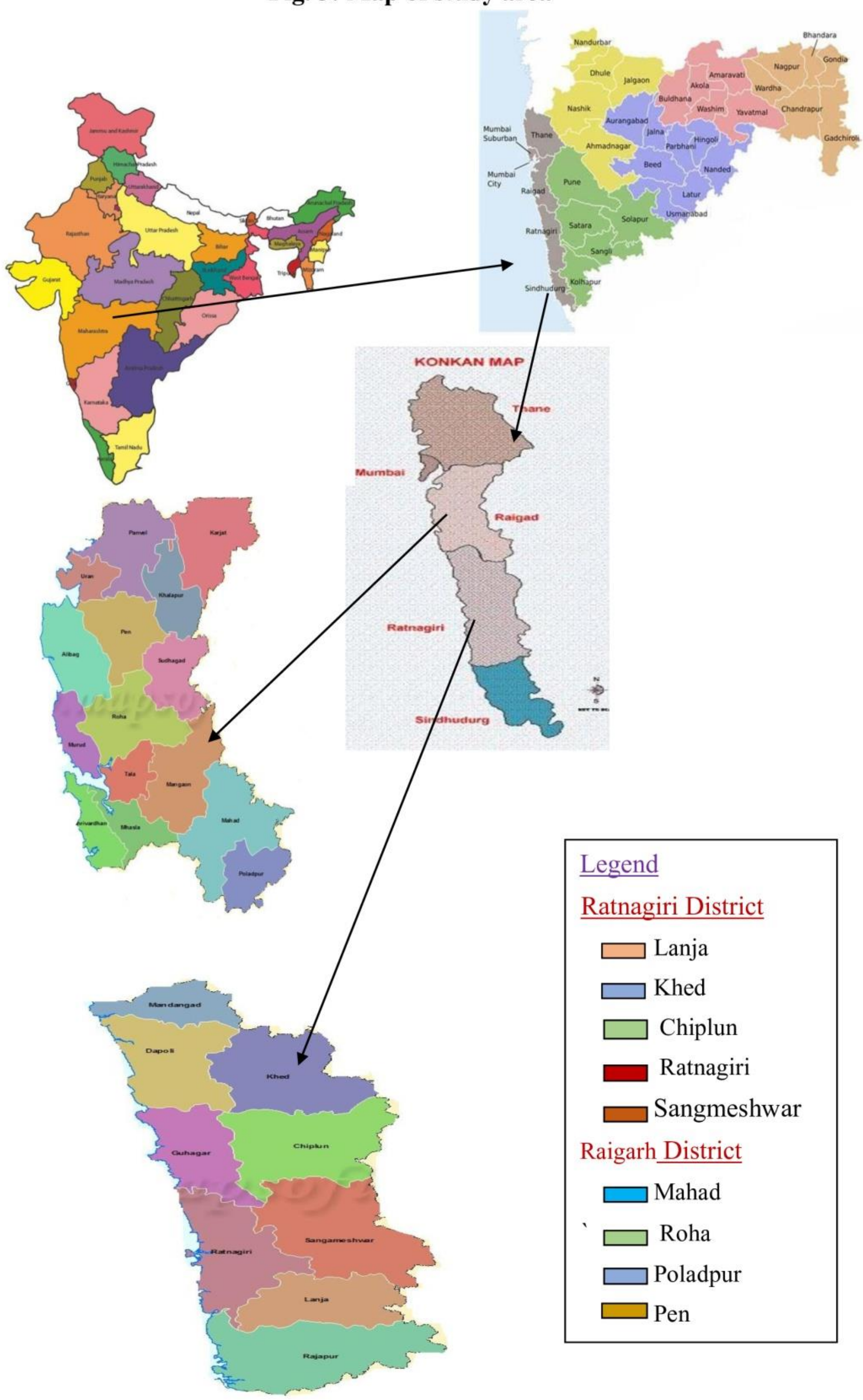
3.1 Locale of the study

The Konkan region of Maharashtra state, comprised of five districts: Palghar, Thane, Raigad, Ratnagiri, and Sindhudurg, was previously under the jurisdiction of the DrBalasahebSawantKonkanKrishiVidyapeeth, Dapoli, an agricultural university of the state. According to ICAR and the National Agricultural Research Project in New Delhi, Maharashtra was classified into eight Agro-Climatic Zones, with two of these zones, North and South Konkan, encompassing the entire Konkan region. In this study, one district was selected from each of these two zones, namely Raigad (North Konkan Zone) and Ratnagiri (South Konkan Zone) in the state of Maharashtra.

Plate I: Investigator while interviewing the respondents.

Plate II: Investigator while interviewing the respondents.

Fig. 3: Map of study area



3.1.1 Topography

The Konkan region, located on the western coast of India, features a hilly topography, with numerous remote villages situated within its boundaries. This region spans a length of 720 kilometers and a width of 50-60 kilometers, forming a coastal belt. The Sahyadri hills separate it from the rest of Maharashtra, while it is bordered by the states of Gujarat and Goa to the north and south, respectively. The region lies between 15°60 and 20°22 North latitude and 72°39 and 73°48 East longitude, and is flanked by the Arabian Sea to the west. The Konkan region covers an approximate area of 30,746 square kilometers.

3.1.2 Soils and climate

The soils present in the Konkan region are predominantly lateritic in nature, characterized by their bright red color and are commonly referred to as rice soils. These soils have been shaped by the prevailing climatic conditions, resulting in the development of six major soil types, including laterite, laterite medium black, coastal alluvial, coastal saline, reddish brown, and coarse shallow. The pH of the soil varies from 5.5 to 6.0, suggesting an acidic nature. The region experiences a warm and humid climate, with monsoon rains typically occurring between the months of June and September. The average annual precipitation in the region is around 3500-4000 mm.

3.1.3 Crops

In the region under consideration, rice (*Oryza sativa.*L) serves as the principal staple food, followed by Ragi (*Eleusingcoracana*) and Vari (*Panicummiliaceum*). The cultivation of these crops primarily takes place during the *Kharif* season. Upon the harvest of the *Kharif* rice, pulse crops such as Wal (*Dolichus lablab*), cowpea (*Vignaunguiculata* spp.), and Kulthi (*Macrotylomauniflorum*) are planted, utilizing residual moisture. In areas where irrigation facilities are available, short-duration cash crops like groundnut (*Arachis hypogea*), water melon (*Citrullus vulgaris*), and vegetables are grown. Among the horticultural crops, mango (*Mangiferaindica*), cashew (*Anacardiumoccidentale*), coconut (*Cocusnucifera*), and arecanut (*Areca catechu* L.) are the most significant crops in the region.

3.2 Research design

The research design serves as a comprehensive plan or program for any investigation, as defined by Tripathi (1987). For the present study, an ex-post-facto research design was adopted, as per Kerlinger (1964). The ex-post facto research design holds significance in social research, particularly when experimental manipulation of independent variables is impractical or ethically unfeasible. This design involves examining the effects of naturally occurring, non-manipulated independent variables on dependent variables, retrospectively. This approach is valuable when investigating phenomena that have already transpired, allowing for the examination of potential causal relationships. Ex-post facto studies are characterized by the absence of researcher intervention in the independent variable, as it has already occurred or cannot be manipulated. Researchers employing this design analyze existing data, conduct retrospective analyses, or utilize archival records to draw inferences about the impact of certain conditions or events on social outcomes. While ex-post facto designs do not offer the same level of control as experimental designs, they provide valuable insights into real-world scenarios and contribute to the understanding of complex social phenomena.

3.3. Sampling technique

The systematic process of selecting a subset of a population known as sampling was utilized in this study to ensure that the chosen sample accurately represented the entire population. Specifically, a random sampling technique was employed to select participants from organic farmers' groups situated in the Konkan region.

3.3.1 Selection of districts

A well-considered approach was undertaken to ensure a comprehensive representation of the agricultural conditions in the Konkan region. In this regard, a specific district was selected from each agroclimatic zone. Notably, the district of "Ratnagiri" was chosen from the southern Konkan zone, while "Raigad" was selected from the northern Konkan zone. This strategic selection was intended to capture the inherent diversity present in the agricultural landscape of the Konkan region.

3.3.2 Selection of organic farmers group

Utilizing a comprehensive list of organic farmer groups obtained from the Agricultural Technology Management Agency (ATMA) office, a carefully curated selection of 30 groups was made from two districts, with each district comprising 15 certified organizations. These selected groups encompass a subset of active farmer organizations engaged in various organic farming endeavors. The selection process was executed with great care to ensure a diverse and representative sample for the study.

3.3.3 Selection of respondent

A systematic random sampling methodology was implemented to select a representative cohort of farmers for the research, encompassing diverse rice-cropping systems. Thirty farmers were randomly chosen from each distinct rice-cropping system category, including rice-fallow land, rice-rice, rice-pulses, rice-oilseeds, and rice-vegetables. This deliberate selection aimed to maintain balance and equitable representation across the various cropping systems. Furthermore, to enhance the diversity of the sample, five organic farmers were randomly selected from each of the 30 organic groups identified in the previous sampling process. As a result, a total of 75 farmers were sampled from each district under investigation, resulting in an aggregate sample size of 150 farmers distributed across the five distinct cropping systems in both districts. This meticulous sampling strategy was designed to comprehensively capture the intricacies and variations inherent in each rice-cropping system, thereby enhancing the robustness and generalizability of the study's findings.

3.4. Quantification of socio-economic, institutional and agroecological characteristics:

The selection of the socio-economic, institutional, and agro ecological characteristics of organic farmers was based on a thorough examination of the literature and consultation with the faculty and experts. The characteristics deemed most applicable and relevant to the current study were chosen. This section presents an operational definition, empirical measurement, and categorization of the aforementioned characteristics of organic farmers.

3.4.1. Age

The operational definition of the age variable was the chronological age of the respondents in completed years at the time of the interview. Based on the mean (51.72) ± standard deviation (13.26), the sampled respondents were categorized into the following groups.

SI. No	Category	Age
1	Young	Up to 38
2	Middle	39 to 64
3	Old	65 and above

3.4.2 Education

The formal educational attainment of the organic farmers was operationally defined as the completed schooling standards, and was measured in terms of the number of completed standards. Each respondent was asked to report their score for each completed standard. Based on government standards, the respondents were categorized into different education categories.

SI. No	Category	Education (Standard)
1	Primary	Up to 4^{th}
2	Secondary	5^{th} to 10^{th}
3	Higher-secondary	11^{th} to 12^{th}
4	Graduate (Any degree)	13 and above

3.4.3. Area under organic agriculture

The actual extent of land under organic cultivation was considered and measured in hectares. Accordingly, the respondents were categorized into five standard landholding categories, as prescribed by the government, based on the total area of land under organic farming owned by them.

SI. No	Category	Area (ha)
1.	Marginal	Up to 1.00 ha.
2.	Small	1.01 to 2.00 ha
3.	Semi-medium	2.01 to 4.00 ha.
4.	Medium	4.01 to 6.00 ha
5.	Large	6.01 ha. and above

3.4.4. Farming income

In the current investigation, agricultural income was defined as the earnings accrued to farmers from their agricultural activities. Utilizing the mean value (Rs.72017) ± standard deviation (37732.2), the participating respondents were subsequently classified into the following three distinct categories.

SI. No	Category	Income
1.	Low	Up to Rs. 34285 /-
2.	Medium	Rs. 34286 to Rs.109,749 /-
3.	High	Rs. 109,750/- and above

3.4.5. Experience in organic farming

It refers to the number of years of experience that the farmer has in practicing organic farming. Based on mean (10.32) ± standard (7.26), the sampled respondents were categorized into the following groups.

SI. No	Category	Experience
1.	Low	Up to 3 years
2.	Medium	4 to 17 years
3.	High	18 years and above

3.4.6. Access to extension organization

The frequency with which organic farmers avail themselves of advisory and extension services provided by various extension institutions was quantified using a dichotomous response format, with a score of 1 assigned to the affirmative response of "Yes" and 0 to the negative response of "No". The respondents were subsequently categorized into two groups based on their responses.

SI. No	Category	Score
1.	Yes	1
2.	No	0

3.4.7.Credit accessibility

This signifies whether the organic farmer availed a crop loan from either nationalized or cooperative banks. It was quantified with a dichotomous response of 'Yes' and 'No,' assigning a score of 1 and 0, respectively. The respondents were then categorized into two groups.

SI. No	Category	Score
1.	Yes	1
2.	No	0

3.4.8. Access to crop insurance

It pertains to the organic farmers' access to the PradhanMantriFasalBhimaYojana (PMFBY), quantified through a binary response of 'Yes' or 'No'.

SI. No	Category	Score
1.	Yes	1
2.	No	0

3.4.9. Social media accessibility

Social media accessibility refers to the ability of a respondent to access various social media platforms to obtain current information and knowledge related to agriculture. The responses of the respondents were evaluated using a three-point scale, with scores of 3, 2, and 1 assigned to the categories of "always," "sometimes," and "never," respectively.

SI. No	Category	Score
1.	Always	3
2.	Sometimes	2
3.	Never	1

3.4.10. Topography

The land on which organic rice farming was conducted was categorized into three distinct groups based on its physical location.

SI. No	Category	Score
1.	Lowland	3
2.	Midland	2
3.	Upland	1

3.4.11. Soil type

An assessment was made of the type of soil upon which organic farming based on rice was conducted. The four categories of soil that were identified are enumerated below.

SI. No	Category	Score
1.	Medium black	4
2.	Lateritic	3
3.	Coastal alluvial	2
4.	Coastal saline	1

3.4.12. Age of organic farm

This is the period during which organic farming practices have been implemented on a particular farm can be referred to as the "duration of organic farming." This is typically measured in completed years. Based on the average duration (9.46 years) ± standard deviation (6.41 years), the following three categories for the age of organic farms have been established.

SI. No	Category	Age (Years)
1.	New organic farm	Up to 3 Years
2.	Middle age organic farm	4 Years to 15 Years
3.	Old organic farm	16 Years and above

3.4.13. On site organic input production

It pertains to the respondent's on-farm production of various types of organic inputs in number. Considering the mean (3.86) ± standard deviation (1.64), the number of onsite input production falls into three distinct categories.

SI. No	Category	Score
1.	Low	Up to 2
2.	Medium	3 to 5
3.	High	6 and above

3.4.14. Livestock possession

It is operationalized as the extent of ownership of livestock enterprises by the organic farmer, reflecting the number of animals in their possession. Grouping of sampled respondents was determined based on the mean (15.66 ± 2.36), resulting in three distinct categories.

SI. No	Category	Score
1.	Low	Up to 3
2.	Medium	4 to 7
3.	High	8 and above

3.4.15. Adoption

Adoption refers to the implementation of significant technological interventions in organic farming by practitioners, who ensure adherence to the fundamental principles of organic agriculture. The selection of practices within the rice-based cropping system is guided by a literature review and consultation with faculty members in the agronomy discipline and SAC (Scientific Advisory Committee) members. Farmers' responses, indicating adoption (scored as 1) or non-adoption (scored as 0), were elicited along a two-point continuum. Through the determination of the mean (5.16) ± standard deviation (1.89), the surveyed respondents were categorized into three groups.

SI. No	Category	Score
1.	Low	Up to 3
2.	Medium	4 to 6
3.	High	7 and above

3.4.16. Marketing channel (intermediaries)`

Marketing channels are the means through which organic products are transported from producers to consumers. To evaluate the marketing channels employed by farmers for their produce, various channels were delineated, and respondents were requested to specify the channel through which they marketed their organic produce. The representation of marketing channels is presented in terms of frequency and percentage. The selected marketing channels are outlined below:

Sl. No.	Marketing channel (Intermediaries)	Yes/ No
1.	Directly to consumer	
2.	Retailer	
3.	Wholesaler	
4.	Village trader	
5.	Co-operatives	

3.5 Theory of planned behaviour: Selected construct and their measurement

In the present study, the comprehensive framework of the extended theory of planned behavior comprises seven distinct elements: intention, attitudes, subjective norms, perceived behavioral control, health consciousness, food security concern, and marketability. The following presents the operational definitions and quantification methods for each construct:

SI. No.	Name of construct	Operational defination	Quantification
1.	Intention	This pertains to farmers' decision-making process in adopting organic farming practices.	The pertinent statements were formulated according to the criteria outlined by Edward (1946). Respondents rated their responses on a five-point scale ranging from strongly agree to strongly disagree, with scores assigned from 5 to 1, respectively. The scoring was reversed for negative statements. This construct employed ten statements to gather responses.
2.	Attitude	It pertains to the positive or negative evaluative responses expressed by the organic farmers regarding the adoption of organic farming.	The provided statements were formulated in accordance with the criteria outlined by Edward (1946). Respondentsrated their responses on a five-point continuum, ranging from strongly agree to strongly disagree, with scores of 5 to 1, respectively, assigned for positive statements. The scoring was reversed for negative statements. Nine statements were employed in this construct to gather responses.
3.	Subjective norms	This term pertains to the societal influence exerted either to encourage or discourage the adoption of organic farming practices.	The provided statements were formulated following the criteria outlined by Edward (1946). Responses were assessed on a five-point continuum, ranging from strongly agree to strongly disagree, with scores assigned from 5 to 1, respectively,assigned for positive

SI. No.	Name of construct	Operational defination	Quantification
			statements. The scoring was reversed for negative statements.This construct employed ten statements to gather responses.
4.	Perceived Behavioral Control	It pertains to farmers' perceptions regarding the perceived control over the ability to adopt organic farming practices.	The statements were formulated in accordance with the criteria provided by Edward (1946). Responses were assessed on a five-point scale, ranging from strongly agree to strongly disagree, with scores assigned from 5 to 1, respectively. The scoring was reversed for negative statements.This construct involved the use of ten statements to gather responses.
5.	Health consciousness	It reflects the extent of arespondent's awareness regarding the healthfulness of their diet and lifestyle.	The statements were formulated in accordance with the criteria established by Edward (1946), and their assessment was based on a five-point scale ranging from strongly agree to strongly disagree. The scores were assigned from 1 to 5, respectively, with the scoring being reversed for negative statements. The construct required the administration of eight statements to elicit responses.
6.	Food security concern	The respondent's belief in their ability to produce a sufficient quantity of food through the means of organic agriculture.	The statements were developed in accordance with the criteria established by Edward (1946). A five-point scale, ranging from strongly agree to strongly disagree, was utilized to assess the responses, with scores assigned from 1 to 5, respectively. The scoring was reversed for negative statements. A total of eight statements were included in this construct.

SI. No.	Name of construct	Operational defination	Quantification
7.	Marketability	It pertains to the ease of selling organic farm produce and maximizing potential premium profits.	The statements were developed in accordance with the guidelines established by Edward (1946), and their evaluation was carried out employing a five-point scale, encompassing responses spanning from strongly agree to strongly disagree, with scores allotted from 1 to 5, respectively. In the case of negative statements, the scoring was inverted. A grand total of seven statements were utilized to gather responses.

Using the mean and standard deviation, the respondents were categorized into three groups for each construct.

3.6 Tools of data collection

This section offers a comprehensive overview of the tools and techniques utilized in the present investigation for data collection. In a systematic manner, the methodology employed for gathering research data is thoroughly explained in this segment. The information provided herein emphasizes the structured approach taken to collect pertinent data for the purpose of analysis and interpretation in the study.

3.6.1 Constriction of the interview schedule

In this research endeavor, a meticulously designed interview schedule was created through the collaborative efforts of researcher, extension faculty, members of SAC and resource experts affiliated with Dr. BalasahebSawantKonkanKrishiVidyapeeth in Dapoli. The formulation of the interview schedule was guided by the objective of aligning the data collection process with the study's overall objectives. During its development, a considerable amount of attention was devoted to constructing questions that were not only straightforward but also self-explanatory and unambiguous. This emphasis was crucial to ensure that respondents could comprehend the inquiries easily, resulting in more accurate and insightful responses.The initial draft of the interview schedule was composed in the English language to maintain precision and clarity. Subsequently, it underwent translation into the local language, Marathi. Adopting a bilingual approach aimed to enhance respondents' understanding of the questions posed to them, thereby fostering a conducive environment for providing appropriate and informative responses.

3.6.2 Pre-testing of interview schedule

Undertaking a pre-test with a sample of 30 organic farmers from a non-sampling area was essential to ensure the efficacy of the interview schedule. The primary objective of this pre-testing phase was to evaluate the clarity and comprehensibility of the questions. Through interactions with the organic farmers, potential practical challenges that might arise during the actual data collection process were identified. Consequently, necessary modifications, inclusive of deletions and additions, were implemented to augment the clarity and pertinence of the questions. The finalized version of the interview schedule, refined through an iterative process, is presented in the Appendix, and served as the foundation for the systematic accumulation of information in the study.

3.6.3 Data collection

The present investigation utilized a pre-tested interview schedule as the primary method for obtaining data from a sample of farmers. In order to enhance the dependability and engagement of the information gathered, the assistance of Local Leaders, Talathi, and Agriculture Assistants was sought when approaching the farmers. This collaborative effort aimed to establish rapport and build trust with the respondents. Before initiating each interview, the investigator introduced himself and provided a comprehensive explanation of the purpose behind his visit to every respondent. In cases where respondents were unavailable during the initial visit, subsequent visits were conducted to ensure the comprehensive and accurate collection of data. This diligent approach to data collection demonstrated a commitment to obtaining reliable and thorough information from the farmers who sampled for the study.

3.7 Statistical analysis

The data collected from participants in this study underwent extensive statistical analysis using a variety of techniques. Descriptive statistics, such as frequency and percentage, were utilized to provide a comprehensive overview of the distribution and prevalence of various variables. The mean was calculated to determine the average value of the collected data points, while the standard deviation was computed to assess the degree of variability within the dataset.Additionally, advanced statistical methods, including structural equation modeling (SEM), were employed to examine intricate relationships among variables and elucidate the underlying structures within the data. SEM enables a thorough investigation of both observed and latent variables, providing a more sophisticated understanding of the interconnections among different factors.

Overall, this multifaceted statistical approach aimed to derive valuable insights and draw valid conclusions from the collected data, thereby offering a solid basis for the analysis and interpretation of the research findings.

3.7.1 Percentage

The term percentage means a fraction whose denomination is 100 and the numeration of the fraction is called percentage. For calculating percentage, frequency was multiplied by 100 and divided by total respondents.

$$P=(n/N) * 100$$

Where,

P- Percentage

n- Frequency of particular cell

N- Total number of sampled respondents

3.7.2 Arithmetic mean ($\overline{X}$)

It is defined as the sum of all the values of the observations divided by the total number of observation (n); symbolically it is represented as;

$$\overline{X} = \frac{\sum_{i=1}^{n} Xi}{n}$$

Where,

$\overline{X}$ = Arithmetic mean

$\sum Xi$ = Sum of respondent's score

n = Number of respondents

3.7.3 Standard deviation (σ)

It is a positive square root of the mean of the sum of the square of the deviation taken from the mean of the distribution.

$$S.D. = \sqrt{\frac{\sum (Xi - \overline{X})^2}{(n-1)}}$$

Where,

S.D. = Standard Deviation

$Xi - \overline{X}$ = Deviation from mean

n = Number of respondents

3.7.4 PLS-Structural equation modelling in SMART-PLS

This section delineates the methodology employed for data analysis through Structural Equation Modeling (SEM), a multivariate statistical technique integrating factor analysis and path analysis to scrutinize structural relationships within a research framework. The technique is particularly favored for its capacity to estimate the interdependence among multiple variables in a singular analysis. In SEM, distinctions are made between endogenous variables (equivalent to dependent variables) and exogenous variables (equivalent to independent variables).

The theoretical underpinning of SEM involves two fundamental models: the Measurement Model, elucidating how measured variables collectively represent a theoretical construct, and the Structural Model, illustrating the relationships between constructs. Assumptions for SEM encompass the multivariate normal distribution, linearity in the relationship between endogenous and exogenous variables, absence of outliers, the existence of a cause-and-effect relationship, non-spurious relationships in observed covariances, model identification, uncorrelated error terms, and the use of interval-level data, particularly Likert scale data.

The procedural steps for conducting SEM are outlined as follows:

- **Defining Individual Constructs: The initial step involves theoretical definition of constructs, followed by a pre-test and Confirmatory Factor Analysis (CFA) to confirm the measurement model.**
- **Developing the Overall Measurement Model: Also known as path analysis, this step establishes relationships between exogenous and endogenous variables, adhering to the assumption of unidimensionality.**
- **Designing the Study: Researchers must design the study to minimize identification problems, employing order condition and rank condition methods.**
- **Assessing Measurement Model Validity: Confirmatory Factor Analysis (CFA) is utilized to compare the theoretical measurement against the actual model, ensuring validity of the constructs.**

- **Specifying the Structural Model: Structural paths are drawn between constructs, representing cause-and-effect relationships. The model can be either recursive or non-recursive.**

- **Examining Structural Model Validity: The final step involves assessing the validity of the structural model, considering the chi-square test, incremental fit indices (e.g., CFI, GFI, TLI, AGFI), and badness of fit indices (e.g., RMR, RMSEA, SRMR).**

In the present study, Structural Equation Modeling was conducted using SMART-PLS software version 4.0, which was freely available for a one-month period.

RESULTS AND DISCUSSION

CHAPTER IV

RESULT AND DISCUSSION

The results and discussion chapter serves as the core of this study, providing a comprehensive exploration of the findings and their interpretations. This presents the culmination of extensive research on socio-economic, institutional, and agroecological characteristics, as well as an in-depth analysis of the adoption of organic agricultural practices in rice-based cropping systems. The chapter employs the Theory of Planned Behavior (TPB) and partial least squares structural equation Modeling (PLS-SEM) to identify the determinants shaping farmers' intentions regarding the adoption of agricultural practices. The integration of quantitative results and qualitative insights forms the foundation of the discussion, fostering a nuanced understanding of the intricacies surrounding organic farming within the context of rice cultivation. Additionally, this section outlines the various marketing channels traversed by organic farmers, shedding light on the pathways through which their produce navigates the market landscape. This integrative approach not only presents empirical findings, but also aims to foster a deeper understanding of the complex dynamics that underpin the adoption and dissemination of organic agricultural practices in rice-based cropping systems.In accordance with its stated objectives, the study's findings are presented below, with corresponding captions.

4.1 Socio-economic, institutional, and agroecological characteristics

4.2 Adoption of organic agricultural practices in rice-based cropping systems,

4.3 Determinants of intention regarding adoption of agricultural practices using TPB and PLS-SEM

4.4 Partial least square structural equation modelling using SMART-PLS

4.5 Marketing channels used by organic farmers

4.6 Constraint and suggestion

4.1 Socio-economic, institutional and agroecological characteristics

This study focuses on a comprehensive examination of the socio-economic, institutional, and agroecological characteristics that define organic farmers. These characteristics include pivotal factors such as age, educational background, farming income, extent of land dedicated to organic farming, prior experience in organic farming, accessibility to social media, connection with extension organizations, availability of crop insurance, credit accessibility, on-site organic input production, age of the organic farm, soil type, topography, and possession of livestock. This meticulous selection of parameters aims to capture a holistic view of the diverse elements that contribute to the organic farming landscape, enabling a nuanced analysis of the factors that shape the adoption and sustainability of organic agricultural practices.

4.1.1 Age

The relevance of age as a measure of maturity and experience in the realm of organic farming is noteworthy. The data pertaining to the chronological age of the respondents was subjected to analysis and is presented in Table 2 and Figure 4.

Table 2: Distribution of the respondents according to their age.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Young	23	15.33	31	71	51.72	13.26
2.	Middle	81	54				
3.	Old	46	30.67				
Total		150	100				

The results in Table 2 indicate that a significant majority (54.00 per cent) of the sampled farmers, fell into the ‘middle age’ category, with 30.67 per cent categorized as ‘old’ and 15.33 per cent as ‘young.’ Their age range varied from a minimum of 31 years to a maximum of 71 years, with an average age of 51.78 years. These data underscore the prominence of middle-aged individuals among the organic farmers in Konkan. The preference of middle-aged farmers for organic farming can be attributed to their wealth of experience in traditional agriculture and heightened awareness of sustainable and eco-friendly practices. This inclination reflects their commitment to long-term agricultural and ecological wellbeing. Additionally, the motivation for a healthier lifestyle coupled with the increasing demand for organic produce acts as a compelling factor for middle-aged individuals to adopt organic farming.

The alignment of these findings with the observations of Priyanka Ingle (2020), who reported an average age of 56 years for organic farmers, further supports the robustness of the results. The prevalence of middle-aged farmers practicing organic farming is consistent with studies by Ahmed (2019) and Nisha Yadav (2020), indicating a broader trend in this demographic group. This convergence of evidence emphasizes the importance of understanding and catering to the specific needs and motivations of middle-aged farmers in promoting sustainable organic agriculture in the Konkan region.

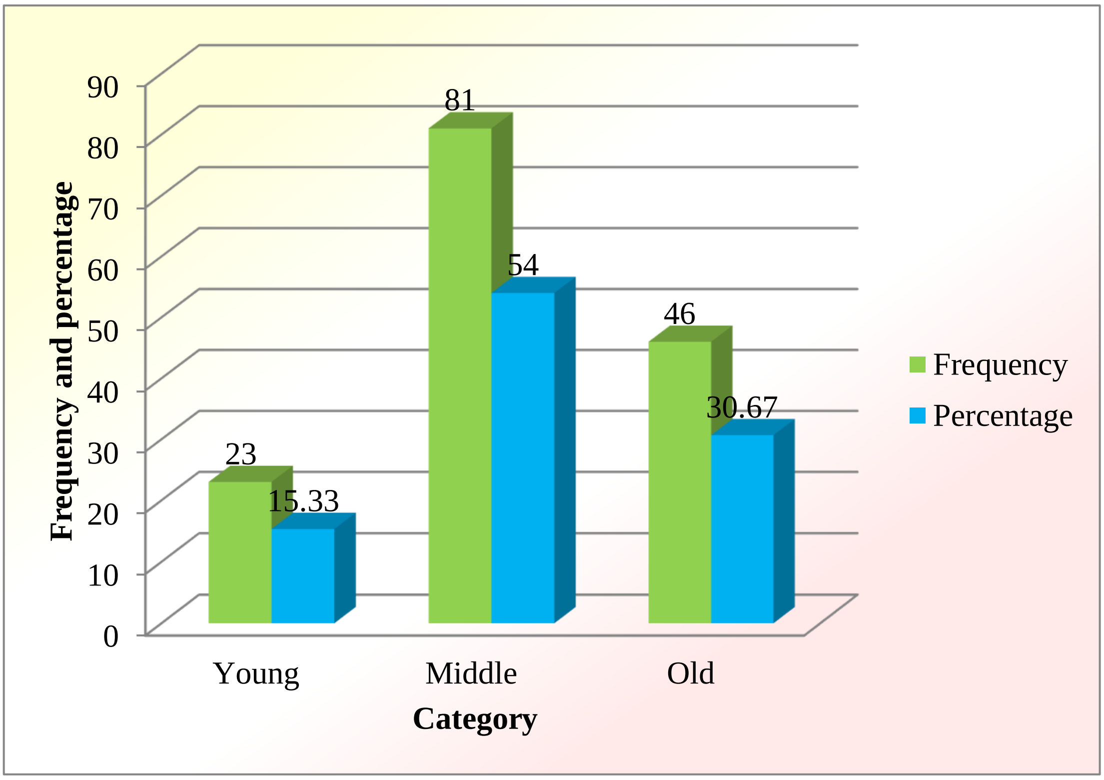


Figure 4: Distribution of the respondents according to their age

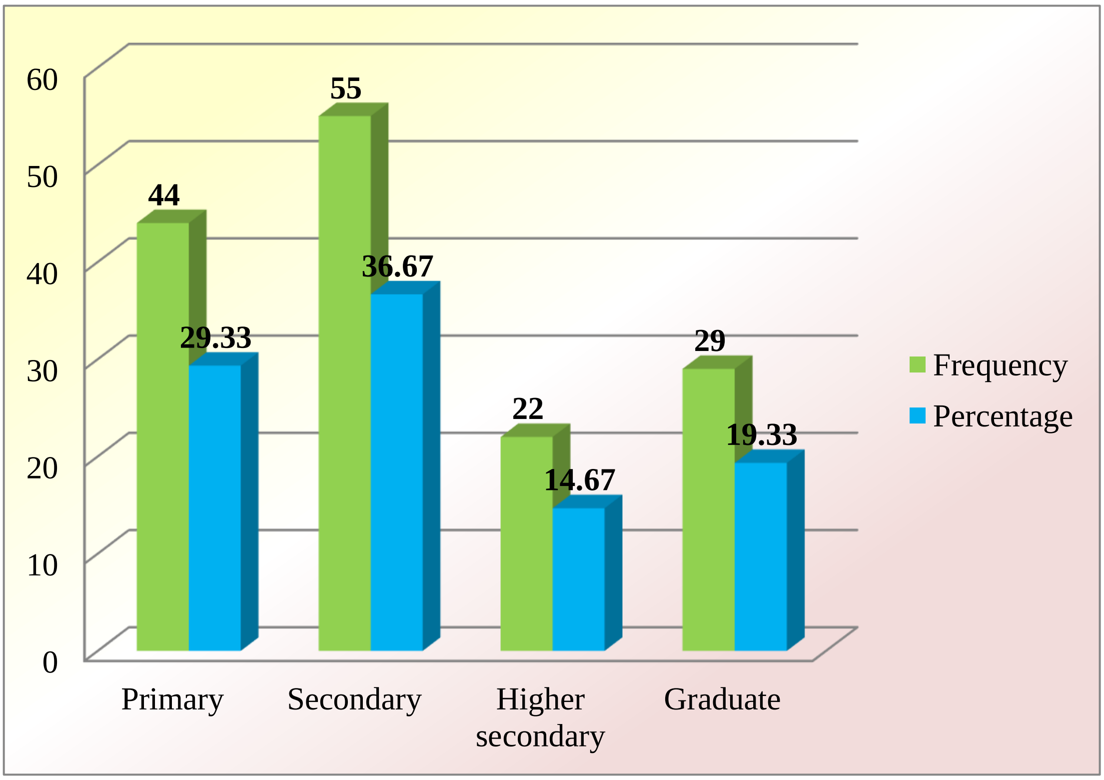


Figure 5: Distribution of the respondents according to their education

4.1.2Education

Education is widely recognized as a catalyst for promoting favorable changes in individual behavior. The educational achievements of the respondents are presented in Table 3 and depicted visually in Figure 5.

Table 3: Distribution of the respondents according to their education.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1	Primary	44	29.33	4	16	9.79	3.57
2	Secondary	55	36.67				
3	Higher secondary	22	14.67				
4	Graduate	29	19.33				
Total		150	100.00				

Table 3 provides a comprehensive overview of the educational profiles of the organic farmers. It is noteworthy that 36.67 per cent possess 'secondary education' as their highest level of attainment, followed by 29.33 per cent with 'primary' education, 19.33 per cent with a 'graduate' degree, and 14.67 per cent having completed 'higher secondary' education. Surprisingly, the average education level reached the 10th standard, with the most advanced qualification at the postgraduate level. Remarkably, none of the respondents was classified as illiterate, reflecting a commendable overall educational achievement among the surveyed organic farmers.

The high prevalence of secondary education among organic farmers may increase their understanding and acceptance of sustainable agricultural techniques, thereby leading to improved communication and extension services. This substantial educational foundation, with a primary emphasis on secondary education, conforms to the findings of Azam and Shaheen (2018), Ahmed (2019), and Priyanka Ingle (2020), who collectively demonstrate a rising trend of greater educational levels among organic farmers. The absence of illiteracy indicates that organic farming in the study region is mainly carried out by individuals who possess at least anelementary level of education.

4.1.3 Area under organic agriculture

The data presented in Table 4 and 6 provide insights into the distribution of organic rice farmers based on the extent of land dedicated to organic agriculture. A substantial portion (50.67 per cent) falls within the 'marginal' category of land, followed by 22.00 per cent in the 'small' category, and 21.33 per cent and 6.00 per cent in the 'semi-medium' and 'medium' categories, respectively. The recorded range spans from a minimum of 0.10 hectares to a maximum of 4.6 hectares, with an average reported area of 1.38 hectares.

Table 4: Distribution of respondents according to their area of organic agriculture.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Marginal	76	50.67	0.1	4.6	1.38	1.10
2.	Small	33	22.00				
3	Semi-medium	32	21.33				
4.	Medium	9	6.00				
Total		150	100.00				

These data highlight a clear trend wherein the majority of respondents operate within a 'marginal' area (0.10–1.00 hectare) under organic farming. Nonetheless, a significant proportion of respondents manage 'small,' 'semi-medium,' and 'medium' areas under organic cultivation. This diversity in landholding patterns suggests that organic farming in the Konkan region engages heterogeneous groups of farmers.

A plausible explanation for this diversity lies in the historical context of the land distribution. The progressive subdivision of ancestral lands due to the growth in the number of households over the years has resulted in smaller individual landholdings. This phenomenon, known as land fragmentation, limits per capita land availability. The findings of this study align with those of Patel (2015), Bhatiya (2015), and Shigwan (2019), emphasizing the prevalence of varied landholding sizes among organic farmers.

4.1.4 Farming income:

The income derived from farming, which serves as a vital indicator of a farmer's financial well-being, encompasses all earnings generated from agricultural activities. To provide insights into the financial circumstances of organic farmers, data on farming income were collected, analyzed, and are presented in Table 5 and Figure 7.

Table 5: Distribution of respondents according to farming income.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low	38	25.33	9,900	3,75,000	72,017	37,732.24
2.	Medium	83	55.34				
3.	High	29	19.33				
Total		150	100.00				

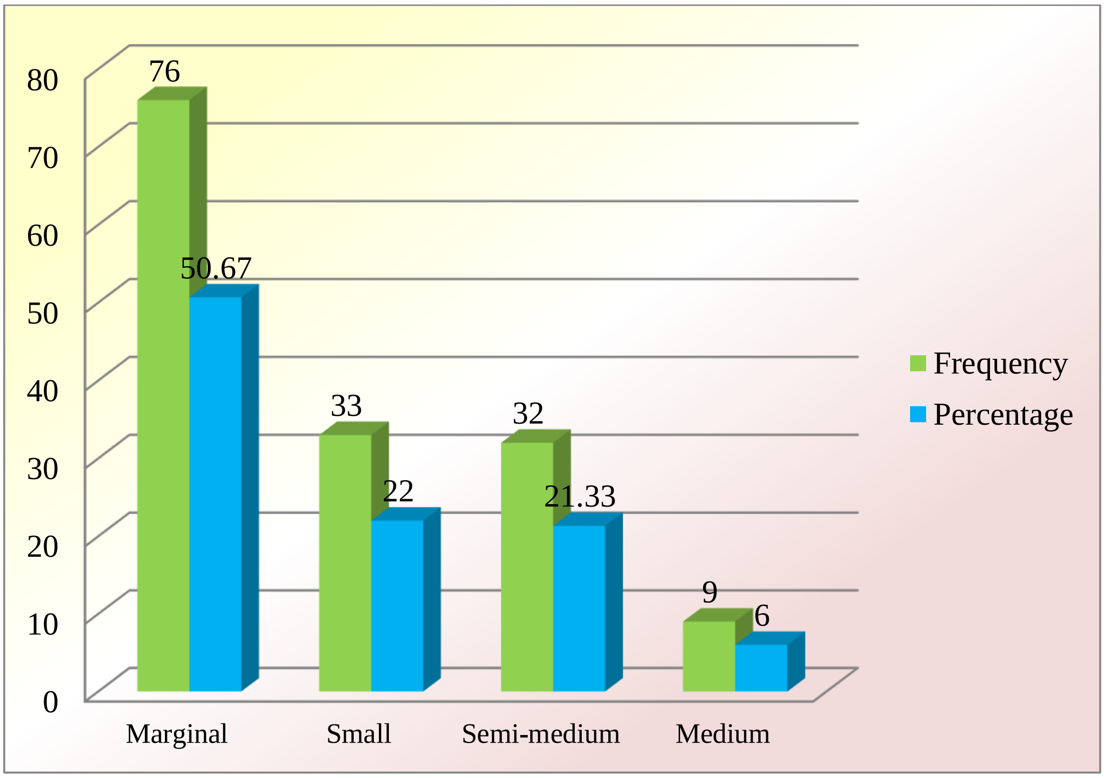


Figure 6: Distribution of the respondents according to their area under organic agriculture

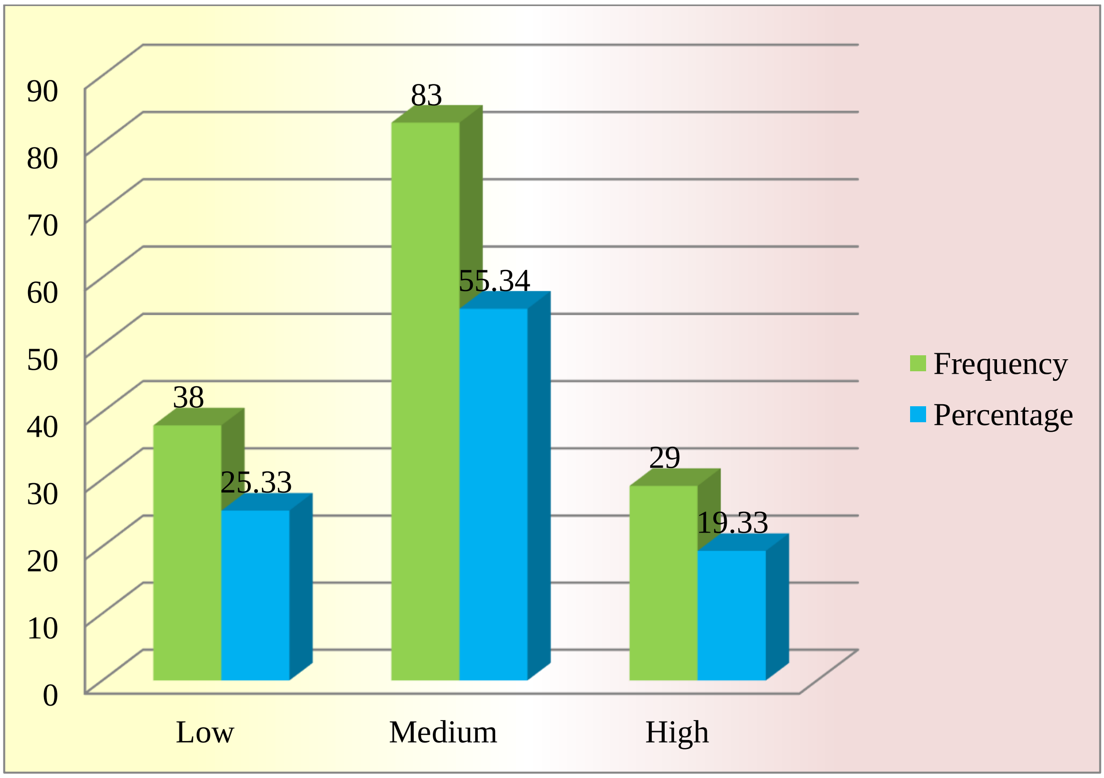


Figure 7: Distribution of the respondents according to their farming income

Table 5 revealed that the majority of organic farmers (55.34 per cent) belonged to the 'medium' income category, ranging from Rs. 34,285 to Rs. 1,09,749. This was followed by 25.33 per cent in the 'low' income category (<Rs. 34,284/-), and 19.33 per cent in the 'high' income category (>Rs. 1,09,750/-). The average income derived from farming was Rs. 72,017, with a minimum income of Rs. 9,900 and maximum income of Rs. 3,75,000, indicating satisfactory economic standing among the respondents. This economic status is likely a result of their dedication to farming as a primary occupation, particularly with marginal and small landholdings. The data suggest a concerted effort to maximize earnings from available land, reflecting a strategic approach to improving economic conditions.

The prevalence of a significant percentage in the 'medium' income category aligns with findings from Kadam (2016) and Priyanka Ingale (2020), who reported similar trends of respondents falling into the medium income bracket. This consistency across studies highlights a noteworthy pattern within organic farming communities.

4.1.5 Experience in organic farming

Data pertaining to the number of years farmers have actively engaged in organic agriculture were collected, analyzed, and are presented in Table 6 and Figure 8.

Table 6: Distribution of the respondents based on their experience in organic farming.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low (up to 3 years)	22	14.67	2	37	10.32	7.26
2.	Medium (4 to 17 years)	108	72.00				
3.	High (18 years &above)	20	13.33				
Total		150	100.00				

As shown in Table 6, the majority of respondents (72.00 per cent) had 4 to 17 years of experience in organic farming, followed by 14.67 per cent with less experience (up to 3 years) and 13.33 per cent with more experience (18 years and above). This distribution suggests a predominant trend of farmers having a moderate level of experience in organic farming, as indicated by the significant percentage falling within the 'medium' category. These findings are consistent with those of Prasanth (2016) and Priyanka Ingale (2020), further supporting the incidence of a moderate range of experience among organic farmers. This pattern suggests a stable and evolving organic farming community, with a substantial number of farmers having acquired considerable yet manageable experience. This moderate level of experience may contribute to a balance between established organic practices and the incorporation of innovative and sustainable farming techniques.

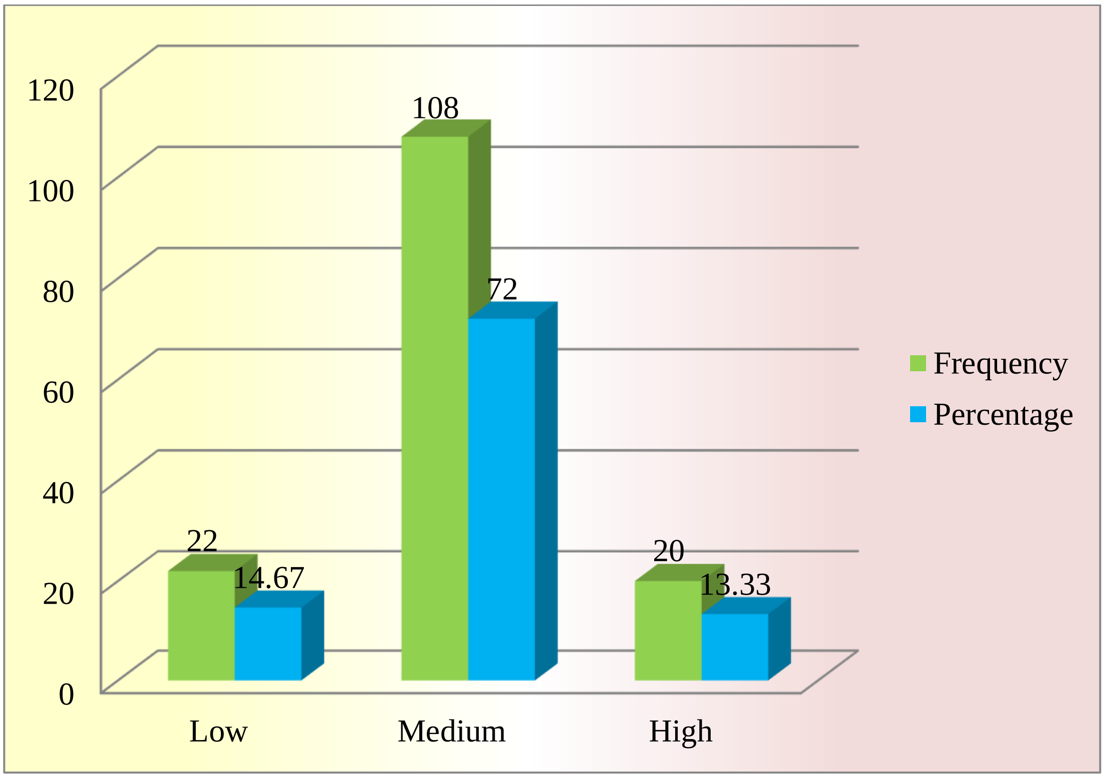


Figure 8: Distribution of the respondents according to their experience in organic farming

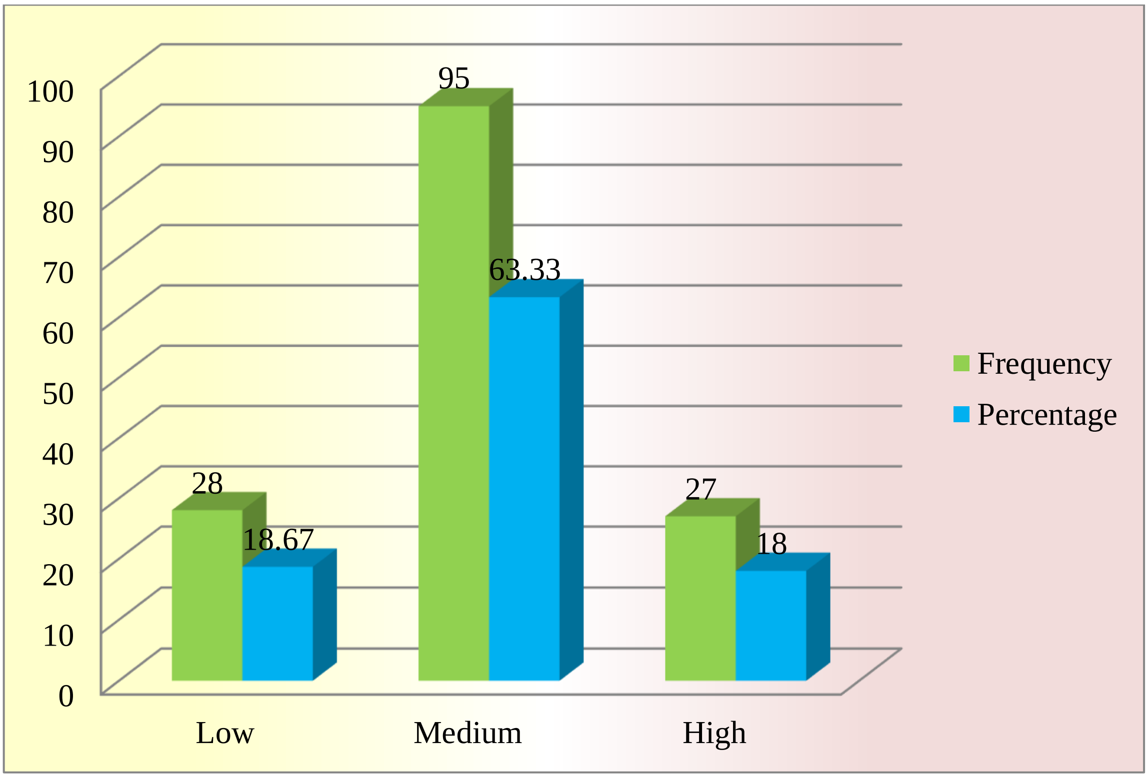


Figure 9: Distribution of the respondents according to their access to extension organisation

4.1.6 Access to extension organisation

It was expected that the respondents' access to various extension organizations encouraged them to adopt organic farming. The data on access to extension organisation is presented in Tables 7a, 7b and Figure 9.

Table 7a: Distribution of the respondents according to access to extension organisation.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low	28	18.67	0	8	3.83	2.37
2.	Medium	95	63.33				
3.	High	27	18.00				
Total		150	100.00				

The data presented in Table 7a highlights that a substantial percentage (63.33 per cent) of organic farmers fell within the 'medium' category concerning access to extension organizations, with 18.67 per cent and 18.00 per cent of respondents in the 'low' and 'high' categories, respectively. This suggests that the majority of organic farmers maintained a medium level of access to various extension organizations.

These findings align with those of Falola and Mukaila (2022), who also observed that a significant proportion of organic farmers had access to extension organizations. Djokoto *et.al.*, (2016) reported a parallel trend, revealing that 84 per cent of conventional cocoa farmers had access to extension services.

Table 7b: Distribution of respondents based on their frequency of access to various extension organizations.

Sl. No.	Extension organisation	Frequency (N=150)	Percentage
1.	ICAR research institutes	11	7.33
2.	State Agricultural University (SAU)	87	58.00
3.	Krishi Vigyan Kendra (KVK)	78	52.00
4.	Agriculture Technology Information Centre (ATIC)	27	18.00
5.	State Department of Agriculture	85	56.67
6.	Panchayat Raj Institutes (PRI)	91	60.67
7.	Agriculture Technology Management Agency(ATMA)	139	92.67
8.	Non-government organizations (NGOs)	52	34.67

**Figures in parentheses indicates percentage.*

In the context of this study, the 'medium' access levels indicate a balanced and widespread dissemination of information and support through extension services among organic farmers. This balanced distribution may contribute to the effective adoption and implementation of organic farming practices because farmers with medium access levels are likely to receive a well-rounded spectrum of guidance and knowledge.

Table 7b presents data on the accessibility of agricultural institutions among the respondents. It is noteworthy that the majority (92.67 per cent) of respondents reported having access to the Agriculture Technology Management Agency (ATMA), indicating the widespread utilization of this resource. Close behind were Panchayat Raj Institutes (PRIs), with 60.67 per cent of the respondents reported access. More than half of the respondents reported access to State Agricultural University (58.00 per cent), State Department of Agriculture (56.67 per cent), and Krishi Vigyan Kendra (52.00 per cent). Approximately one-third of the respondents had access to non-governmental organizations, and 18.00 per cent and 7.33 per cent of farmers were reported access to the Agricultural Technology Information Centre (ATIC) and ICAR research institutes, respectively.

The frequency of access to these institutions suggests a significant level of engagement among the organic farmers with diverse agricultural resources. The high percentage of access to ATMA and PRIs indicates significant reliance on line departments. The substantial access to State Agricultural University, State Department of Agriculture, and Krishi Vigyan Kendra underscores the importance of academic and frontline extension services in supporting organic farming practices.

4.1.7 Credit accessibility

This indicates the availability of credit to organic farmers from institutional credit agencies. Agricultural credit serves as a vital financial support mechanism that facilitates effective management of organic farms. Data on access to crop loans were collected, analyzed, and are presented in Table 8 and Figure 10.

Table 8: Distribution of the respondents according to their credit accessibility.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Yes	96	64.00	0.00	1.00	0.64	0.48
2.	No	54	36.00				
Total		150	100.00				

The data presented in Table 8 reveal that a significant proportion of respondents (64.00 percent) had obtained crop loans, while the remaining 36.00 percent did not.

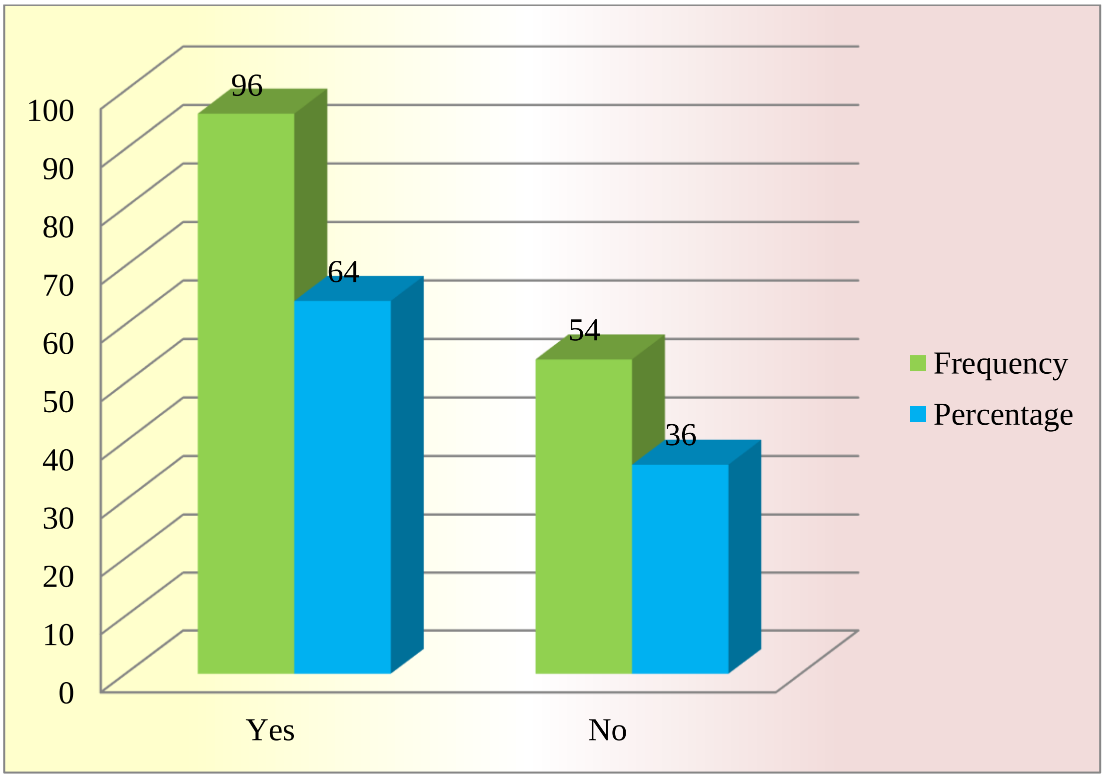


Figure 10: Distribution of the respondents according to their credit accessibility

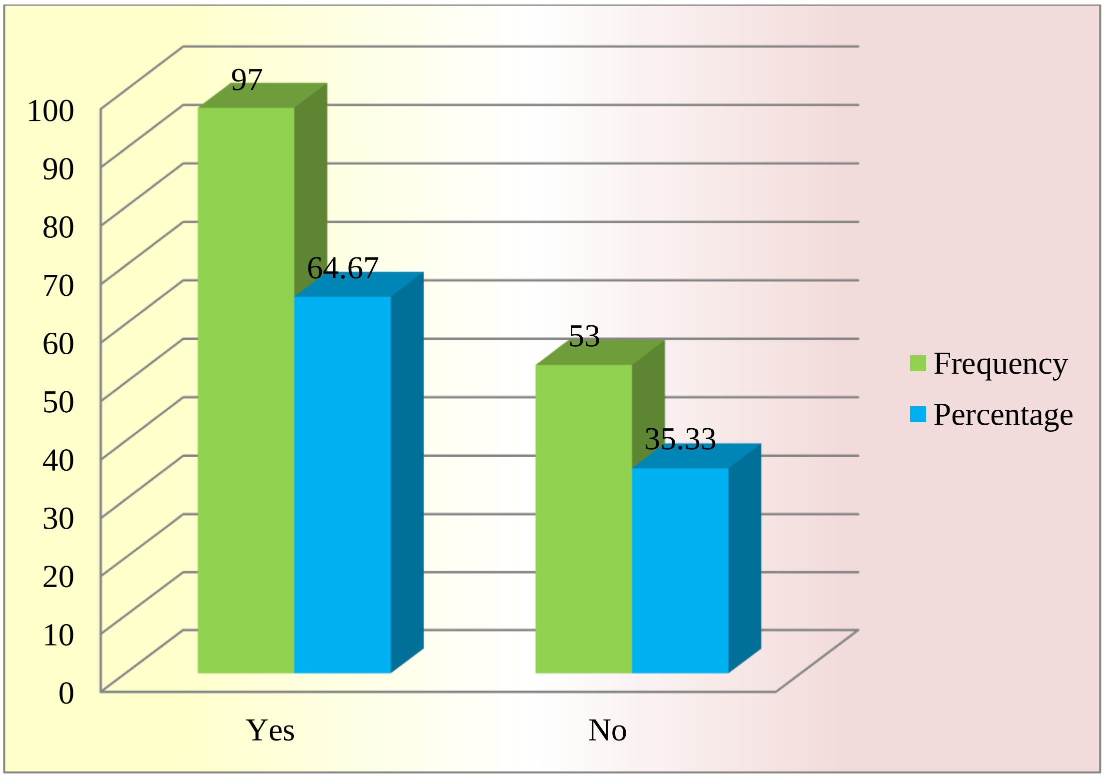


Figure 11: Distribution of the respondents according to their access to crop insurance

The primary sources of these crop loans were national and cooperative banks, indicating their accessibility and reliance on institutional credit. This finding highlights the crucial role that formal financial institutions play in supporting agricultural activities. These results are consistent with those of Jagtap (2022), who reported that 79.16 percent of respondents had secured crop loans.

4.1.8 Access to crop insurance

The accessibility of Pradhan Mantri Fasal Bhima Yojana (PMFBY) to organic farmers has been the subject of investigation. The data collected from crop insurance coverage were analyzed and are presented in Table 9 and Figure 11.

Table 9: Distribution of respondents according to their access to crop insurance.

<table>
<tr><th>Sl. No.</th><th>Category</th><th>Frequency (N=150)</th><th>Percentage</th><th>Min.</th><th>Max.</th><th>Mean</th><th>SD</th></tr>
<tr><td>1.</td><td>Yes</td><td>97</td><td>64.67</td><td rowspan="3">0</td><td rowspan="3">1</td><td rowspan="3">0.65</td><td rowspan="3">0.48</td></tr>
<tr><td>2.</td><td>No</td><td>53</td><td>35.33</td></tr>
<tr><td colspan="2">Total</td><td>150</td><td>100.00</td></tr>
</table>

Table 9 indicates that a greater proportion (64.67 per cent) of respondents had access to Pradhan Mantri Fasal Bhima Yojana (PMFBY), which offers crop insurance, compared to the remaining 35.33 per cent who did not have access (PMFBY). The limited adoption of crop insurance can be linked to factors such as insufficient awareness among farmers, delays in claim settlement, inadequate dissemination channels, and limited knowledge of risk management. These results align with findings of Jagtap (2022) emphasized that majority of respondents had access to Pradhan Mantri Fasal Bhima Yojana. This highlights the extensive accessibility of the scheme while also highlighting the existing obstacles that hinder its effective utilization. Addressing these obstacles through intensified awareness campaigns and streamlined administrative processes could contribute to higher adoption of crop insurance, leading to better risk management for farmers in the study region.

4.1.9 Social media accessibility

The data in Table 10a revealed that a considerable proportion of organic farmers (42.0 per cent) fall within the 'medium' category with respect to social media accessibility. In contrast, 29.3 per cent and 28.67 per cent of respondents were categorized into the 'low' and 'high' accessibility groups, respectively. This distribution suggests that the majority of the respondents had a moderate level of access to various social media platforms. Notably, this outcome aligns with the results of previous studies conducted by Rana and Singh (2014), Soni (2016), and Jagtap (2022), who reported that a considerable number of respondents had access to social media. This moderate accessibility to social media platforms among organic farmers indicates balanced exposure to digital information and communication channels. This could potentially impact the dissemination of information on organic farming practices, market trends, and innovations within the agricultural sector. The convergence of these findings with previous studies strengthens the reliability of the current research, emphasizing a consistent pattern of social media usage within the organic farming community.

Table 10a: Distribution of respondents according to social media accessibility.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low	44	29.33	7	18	10.79	3.05
2.	Medium	63	42.00				
3.	High	43	28.67				
Total		150	100.00				

The data depicted in Table 10b and Figure 12 provide valuable insights into the digital media usage patterns of respondents. It is worth noting that the majority (36.67 per cent) of the respondents consistently accessed WhatsApp, followed by YouTube (26.00 per cent), and Facebook (12.00 per cent). Conversely, 22.67 per cent of the respondents occasionally accessed Instagram. LinkedIn and Twitter were rarely used, with 89.33 per cent of respondents indicating that they had never accessed these platforms. Additionally, a substantial majority (77.33 per cent) reported never using an agricultural app.

Table 10b: Distribution of respondents according to frequency of social media accessibility.

Sl. No.	Social media	Accessibility frequency (N=150)		
		Always	Sometimes	Never
1.	WhatsApp	55 (36.67)	14 (9.33)	81 (54.00)
2.	Facebook	18 (12.00)	22 (14.67)	110 (73.33)
3.	Instagram	0 (0.00)	34 (22.67)	116 (77.33)
4.	Linked In	00 (0.00)	16 (10.67)	134 (89.33)
5.	You tube	39 (26.00)	24 (16.00)	87 (58.00)
6.	Twitter	00 (0.00)	16 (10.67)	134 (89.33)
7.	Agri tools/Apps	11 (7.33)	23 (15.33)	116 (77.33)

**Figures in parentheses indicates percentage*

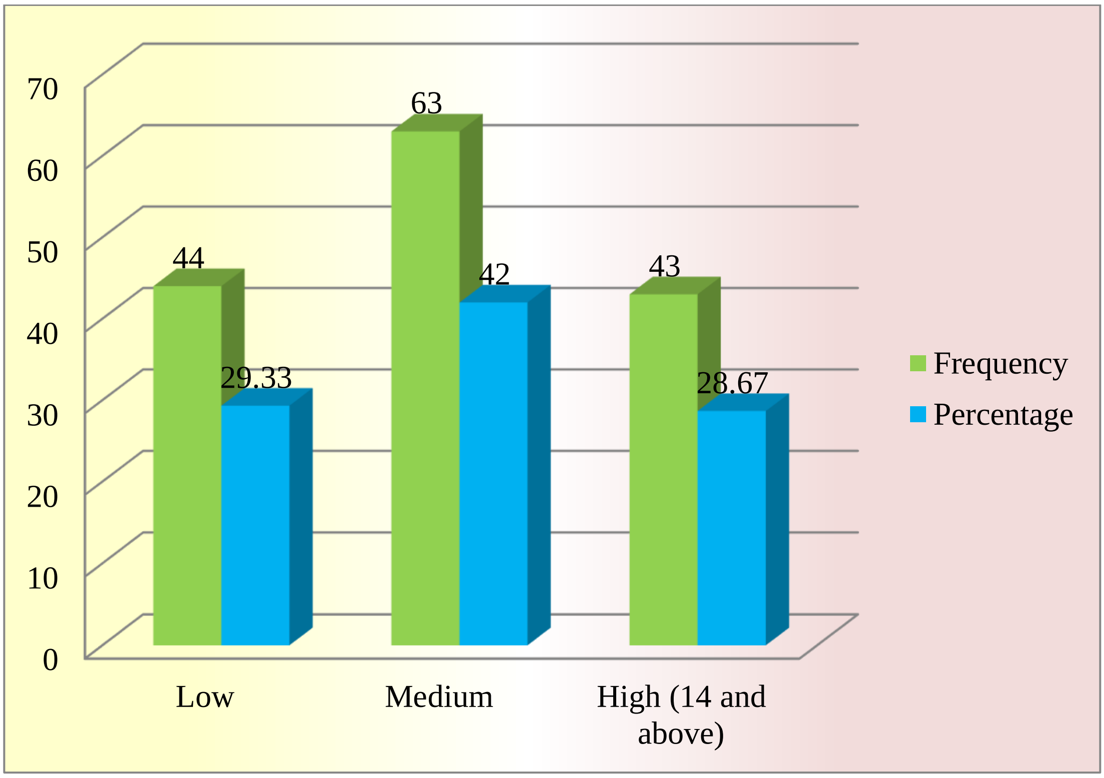


Figure 12: Distribution of the respondents according to their social media accessibility

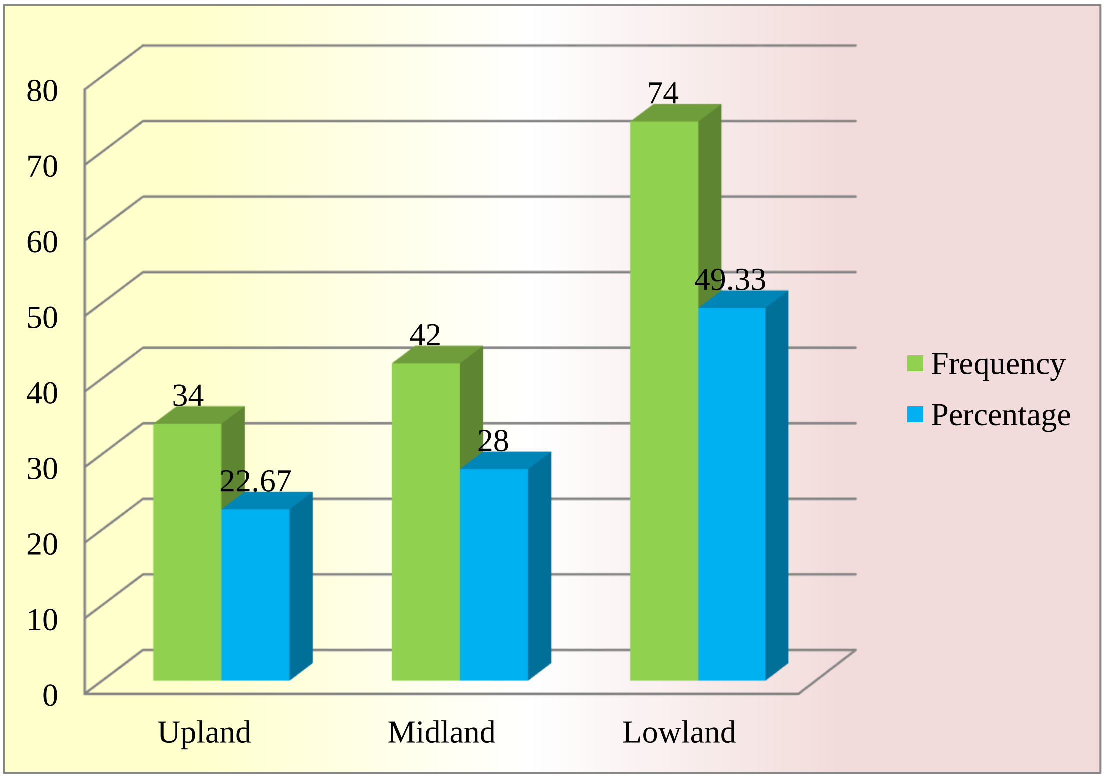


Figure 13: Distribution of the respondents according to their topography of land

These findings emphasize the prevalence of WhatsApp as a prominent social media among organic farmers, indicating its potential as an effective platform for information dissemination and knowledge sharing within the community. The usage of YouTube and Facebook further highlights the importance of multimedia platforms for reaching and engaging with this demographic. The infrequent use of Instagram, LinkedIn, and Twitter suggests a more selective usage of social media platforms within this farming community. Furthermore, the significant percentage (77.33 per cent) of respondents who reported never using agricultural apps suggests a potential gap in the integration of digital applications for farm management. This could be attributed to factors such as limited awareness, accessibility, or the perceived relevance of these applications within the context of organic farming.

It is imperative to investigate the implications of digital media usage patterns on the transfer of knowledge, access to markets, and communication within the organic farming community. It is essential to explore strategies that capitalize on the widespread use of WhatsApp, YouTube, and Facebook to disseminate information and cultivate a sense of community. Furthermore, addressing the obstacles hindering the adoption of agricultural tools and mobile applications can bolster the technological proficiency of farmers, ultimately leading to enhanced agricultural practices and operational efficiency.

4.1.10 Topography

Topography pertains to the physical characteristics and positioning of the land where organic farming is practiced. The analysis considered the topographical features of the land on which organic farming was conducted, and the corresponding data are detailed in Table 11 and illustrated in Figure 13.

Table 11: Distribution of the respondents according to their topography

Sl. No.	Topography	Frequency (N=156)	Percentage	Min.	Max.	Mean	SD
1.	Upland	34	22.67	01.00	03.00	1.946	00.71
2.	Midland	42	28.00				
3.	Lowland	74	49.33				
Total		150	100.00				

Table 11 reveals a prevailing pattern in the topographical preferences of organic farmers, with a substantial majority (49.33 per cent) opted for 'lowland' terrains. This was trailed by 28.00 per cent and 22.67 per cent of farmers engaged in organic farming on 'midland' and 'upland' topography, respectively. These findings harmonize with similar observations made by Ambali *et.al.* (2021) and Xiaoling Li and Xianrong Wu (2021).

The preference for 'lowland' topography might be ascribed to its potentially advantageous conditions for organic farming practices, such as better water availability and nutrient retention.

The convergence of these results with previous studies solidifies the consistency of this pattern within the organic farming landscape. In the larger scheme of things, comprehending the relationship between topography and organic farming practices is essential for effective agricultural planning and sustainable land utilization.

4.1.11 Soil type

The data pertaining to the type of soil on which various rice-based cropping systems were adopted were collected, analyzed, and are presented in Table 12 and Figure 14.

Table 12: Distribution of the respondents according to their soil type

Sl. No.	Soil type	Frequency (N=150)	Percentage	Min.	Max.	Mean	S.D.
1.	Medium black	53	35.33	2.00	4.00	3.30	0.55
2.	Lateritic	90	60.00				
3.	Coastal alluvial	7	4.67				
Total		150	100.00				

It is evident from Table 12 that the predominant soil type for organic farming practices was lateritic, constituting 60.00 per cent of the respondents. In addition, 35.33 per cent of organic farmers was used 'medium black' soil and 'coastal alluvial' soil by 4.67 per cent. This distribution sheds light on the soil preferences of the organic farmers in the study area.

The acceptance of 'lateritic' soil as the primary choice for organic farming may be attributed to its specific characteristics, such as good drainage and fertility, which are favorable for organic cultivation. The considerable percentage on 'medium black' soil suggests its suitability for organic practices as well. The relatively lower percentage on 'coastal alluvial' soil could be due to specific limitations associated with this type of soil in the context of organic farming.

4.1.12 Age of organic farm

The age of an organic farm directly influences its productivity, subsequently impacting farm income. In light of this, data concerning the age of organic farms was collected, analyzed, and presented in Table 13. The corresponding visual presentation is depicted in Figure 15.

Table 13: Distribution of respondents according to the age of the organic farm.

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	S.D.
1.	New farms	28	18.66	2	30	9.46	6.41
2.	Middle age farms	103	68.67				
3.	Old age farms	19	12.67				
Total		150	100.00				

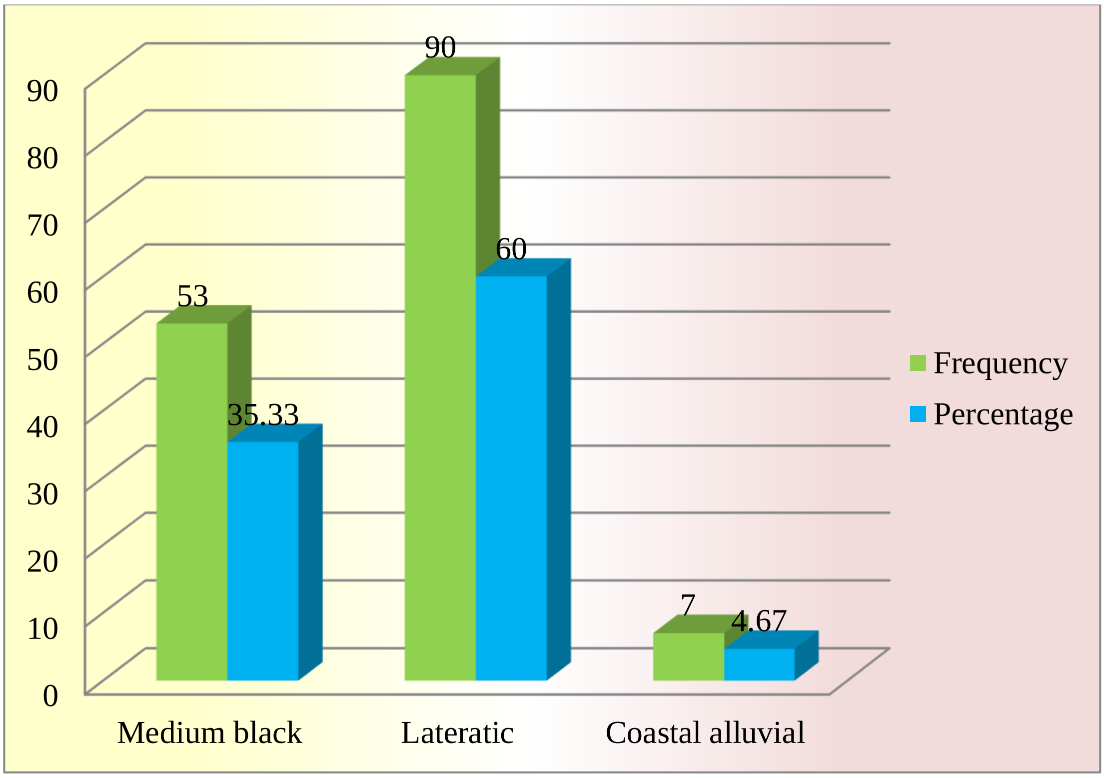


Figure 14: Distribution of the respondents according to their soil type

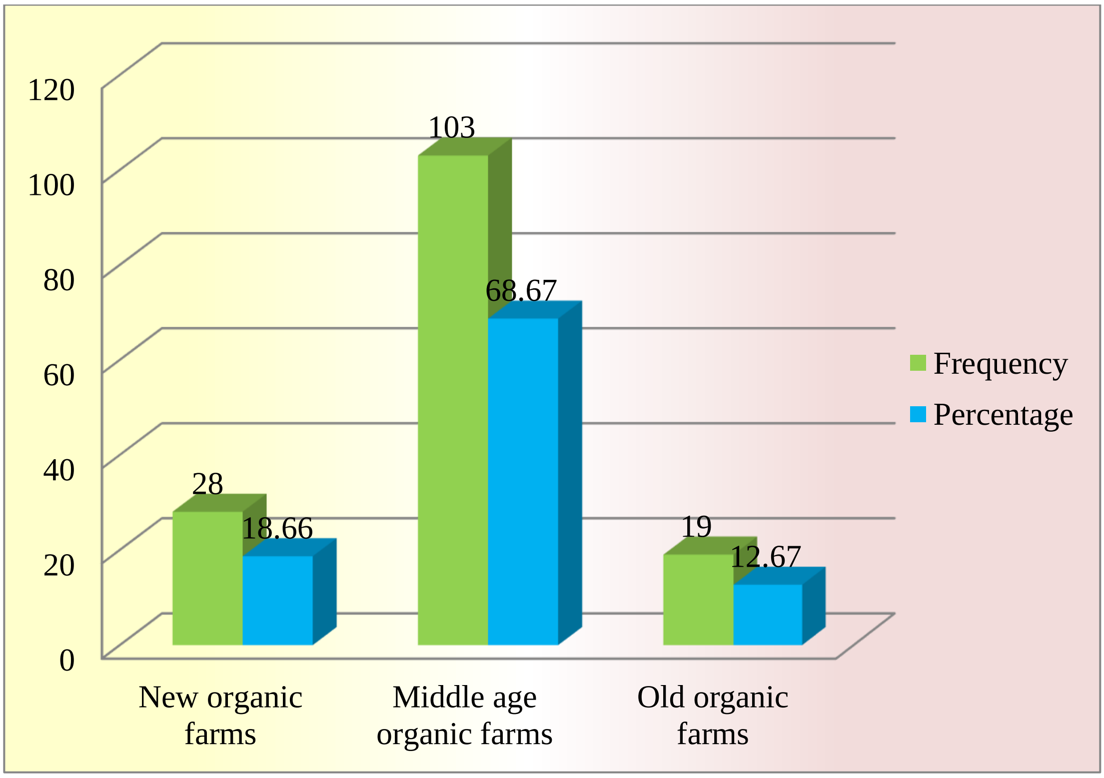


Figure 15: Distribution of the respondents according to their age of organic farm

The results presented in Table 10 indicate that the majority (68.67 per cent) of organic farms fall within the 'middle' age category, with 18.66 per cent categorized as 'new organic farms' and 12.67 per cent as 'old organic farms.' The minimum age recorded for organic farms was two years, the maximum was 30 years, and the average age of organic farms was 9.46 years. These data underscore the prevalence of middle-aged organic farms in the study context.

The observation by Taayler*et.al.*, (2022) supports the current findings, emphasizing that a substantial proportion of organic farms tend to be in the middle-aged category. The age distribution of organic farms is a critical factor in understanding the sustainability of organic farming practices over time.

4.1.13 On site input production

Numerous inputs are utilized in organic farming, and many farmers produce several inputs directly in their fields. To capture this aspect, data on on-site input production were collected, and are presented in Table 14a.

Table 14a: Distribution of the respondents according to their onsite input production.

Sl. No.	Source of inputs	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low (Up to 2)	41	27.33	2.00	7.00	3.86	1.64
2.	Medium (3-5)	78	52.00				
3.	High (6 and above)	31	20.67				
Total		150	100.00				

Table 14a reveal that the majority (52.00 per cent) of organic farmers exhibited a "medium" level of on-site organic input production. Following this, 27.33 per cent of the respondents demonstrated a "low" level, while 20.67 per cent demonstrated a "high" level of on-site organic input production. Farmers reported producing a minimum of two organic inputs and a maximum of seven inputs on their farms.

Table 14b: Distribution of respondents based on different organic input produced by them

Sl. No	Organic inputs	Frequency	Percentage	Preparation Procedure
1)	**Manure**			
i.	FYM	129	86.00	It involves collecting and decomposing farm residues, such as crop straw, animal excreta, and other organic wastes, in a pit or composting unit.
ii.	Poultry litter	72	48.00	Collecting and composting waste from poultry include bedding materials, feathers, manure, and spilled feed.
iii.	Fish meal	16	10.66	It is prepared by grinding and drying the flesh of fish.
iv.	Vermicompost	57	38.00	It is created through vermicomposting, where earthworms decompose organic matter into nutrient-rich compost.
2)	**Green manures**			
i.	Glyricidia	109	72.67	Cultivating Glyricidia plants and integrating them into the soil prior to flowering is a sustainable agricultural practice with multifaceted benefits. Glyricidia, a nitrogen-fixing leguminous plant, enriches the soil by fixing atmospheric nitrogen, enhancing soil fertility, and promoting overall soil health.
3)	**Beejamrut**	61	40.66	• Take 5 kg of indigenous cow dung in a cloth and hang it in 20 liters of water for 12 hours. • Squeeze the bundle of cow dung in water three times to extract material. • Add soil from undisturbed bunds or forest to the solution. • Add 5 liters of indigenous cow urine. • Separately take one liter of water and add 50 g lime in it, keep overnight. Add the lime water to the solution and stir it well

Sl. No	Organic inputs	Frequency	Percentage	Preparation Procedure
4)	**Jeevamrut**	108	72.00	• Mix 10 kg cow dung, 10 liters cow urine, 2 kg pulse flour, 2 kg jaggery, and 150 g soil from undisturbed field bunds. • Stir the mixture for 5-10 minutes twice a day, and it is ready after 7-10 days.
5)	**Panchgavya**	39	26.00	• Combine 5 kg fresh cow dung, 1 kg cow ghee, 3 liters cow urine, 2 liters cow's milk, dozen ripe bananas or any rotting and ripe fruit, 2 kg jaggery, and 2 liters water. • Stir the mixture twice a day, and it is ready after 15-30 days.
6)	**Bio-pesticides**			
i.	Dashaparni ark	43	28.66	• Neem leaves–5 kg, Vitex negundo leaves-2 kg, Aristolochia leaves - 2 kg, Papaya leaves-2 kg, Tinospora cordifolia leaves- 2kg, Custard apple leaves-2 kg, Karanj leaves-2 kg, Castor leaves- 2 kg, Nerium indicum- 2 kg, Calotropis procera leaves-2 kg, Green chili paste-2 kg, Garlic paste-250 g, Cow dung-3 kg, Cow urine-5 lit, Water-200 lit. • Crush all in 500 lit water tank and ferment them for 1 month
ii.	Garlic-Chilli-Butter Milk (*Lamita*) extract	37	24.66	• Crush or grind garlic cloves and green chilies, Mix the paste with buttermilk • Allow the mixture to settle and filter it.

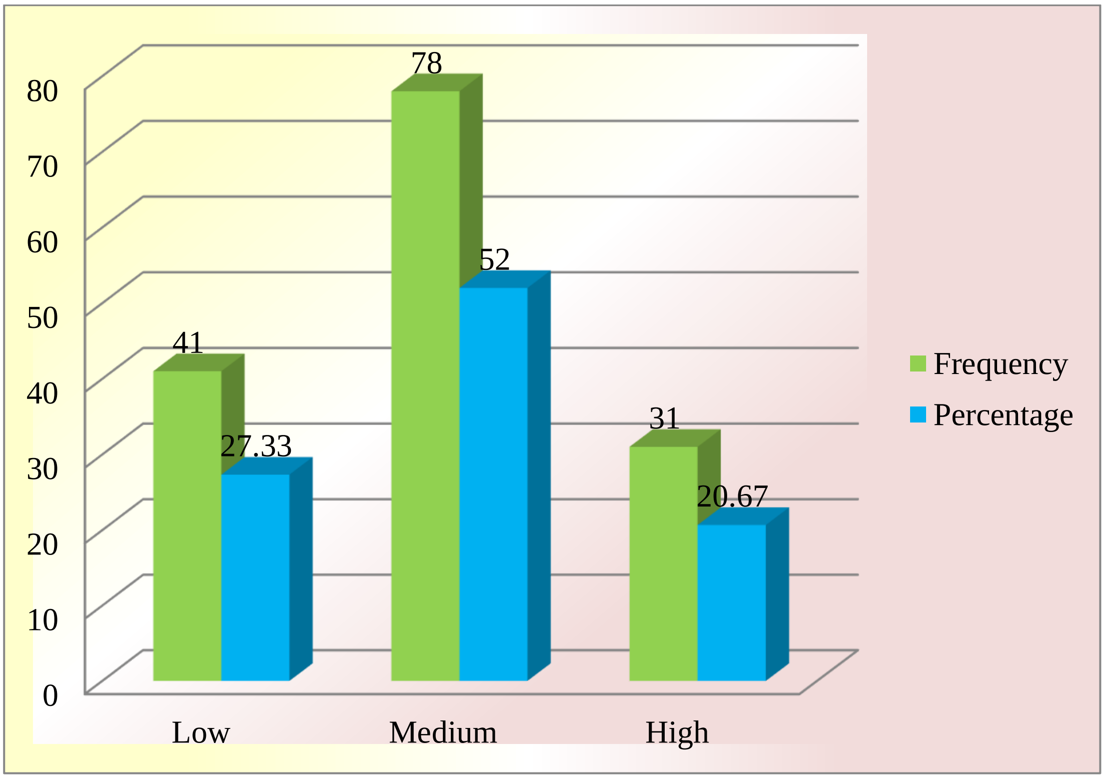


Figure 16: Distribution of the respondents according to their on site input production

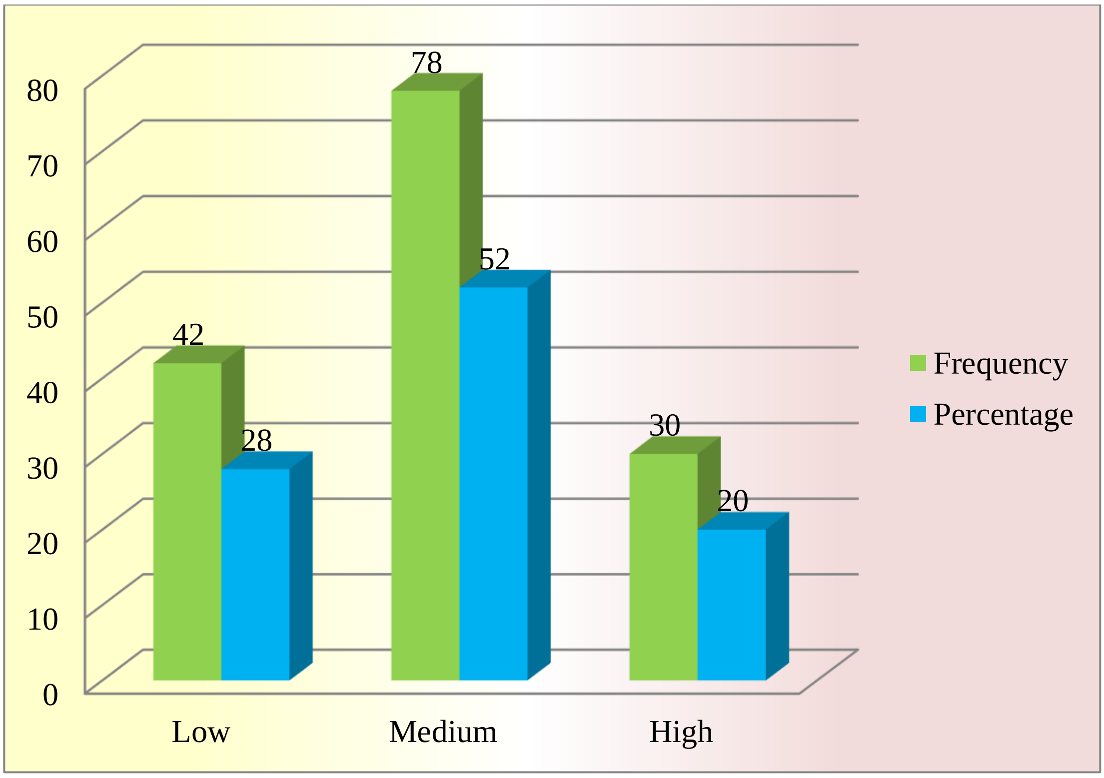


Figure 17: Distribution of the respondents according to their livestock possession

Table 14 b presents a comprehensive overview of on-site organic input production by farmers, showing the frequency and percentage distribution of various inputs. Manure, constituting 86 per cent of on-site production, includes farmyard manure (FYM), poultry litter, fish meal, and vermicompost. FYM, which is derived from decomposed farm residues, is the most prevalent, whereas poultry litter involves composting waste from poultry operations. Fish meal and vermicompost are produced less frequently, each contributing to nutrient-rich soil amendments. Green manure, particularly Glyricidia, dominates on-site production at 72.67 per cent, underscoring its vital role in enhancing soil fertility through nitrogen fixation. Additionally, the table highlights the production frequencies of key on-site inputs, such as Beejamrut, Jeevamrut, Panchgavya, and Bio-pesticides. Among the biopesticides, Dashaparni ark and Garlic-Chilli-Butter Milk (*Lamita*) extracts stood out at 28.66per cent and 24.66per cent, respectively. The detailed preparation procedures provided for each input signify farmers' commitment to adopting scientifically informed and sustainable agricultural practices, contributing to soil health and overall agricultural sustainability.

4.1.14Livestock possession

This refers to the number of animals owned by the farmers. The information regarding livestock possession is depicted in Table 15 and figure 17.

Table 15: Distribution of the orchards according to livestock possessed by farmer

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	S.D.
1.	Low (Up to 3)	42	28.00	0	107	5.66	2.364
2.	Medium (4 to 7)	78	52.00				
3.	High (8 and above)	30	20.00				
Total		150	100.00				

The data in Table 15 highlight that a predominant portion (52.00 per cent) of respondents possessed a medium-sized livestock inventory. Subsequently, 28.00 per cent had small livestock possession, while 20.00 per cent reported more livestock possession. The range of livestock varied from a minimum of 0 to a maximum of 107, including poultry, with average livestock possession of 6. Notably, the constraints on available resources for Konkan farmers may explain their tendency to maintain limited livestock, a crucial component of organic farming.

These findings match those of Monikha (2016) reported that a substantial majority of the respondents had a medium livestock possession. This consistency suggests a prevailing trend in the region, emphasizing the significance of understanding livestock possession as integral facets of organic farming.

4.2 Adoption

Adoption in the context of this study refers to the implementation of significant technological interventions in organic farming by farmers, while upholding the core principles of organic agriculture. Farmers engage in a variety of organic practices on their farms. Consequently, data pertaining to the adoption of organic practices were systematically collected, analyzed, and illustrated in Table 16a and Figure 18.

Table 16a: Distribution of the farmers according to adoption of organic farming practices

Sl. No.	Category	Frequency (N=150)	Percentage	Min.	Max.	Mean	SD
1.	Low (Up to 3.0)	41	27.33	1.0	8.0	5.16	1.89
2.	Medium (4 to 6)	62	41.34				
3.	High (7and above)	47	31.33				
Total		150	100.00				

The data presented in Table 16 reveals that 41.34 per cent of farmers fall within the 'medium' adoption category, followed by 31.33 per cent and 27.33 per cent in the 'high' and 'low' adoption categories, respectively. The adoption spectrum ranged from a minimum of one to a maximum of eight organic practices, with an average adoption rate of 5.16 practices. These findings align with previous studies by Masud Parvez *et.al.* (2018) and Malviya *et.al.* (2020), corroborating the consistency of adoption patterns observed in this study with existing research.

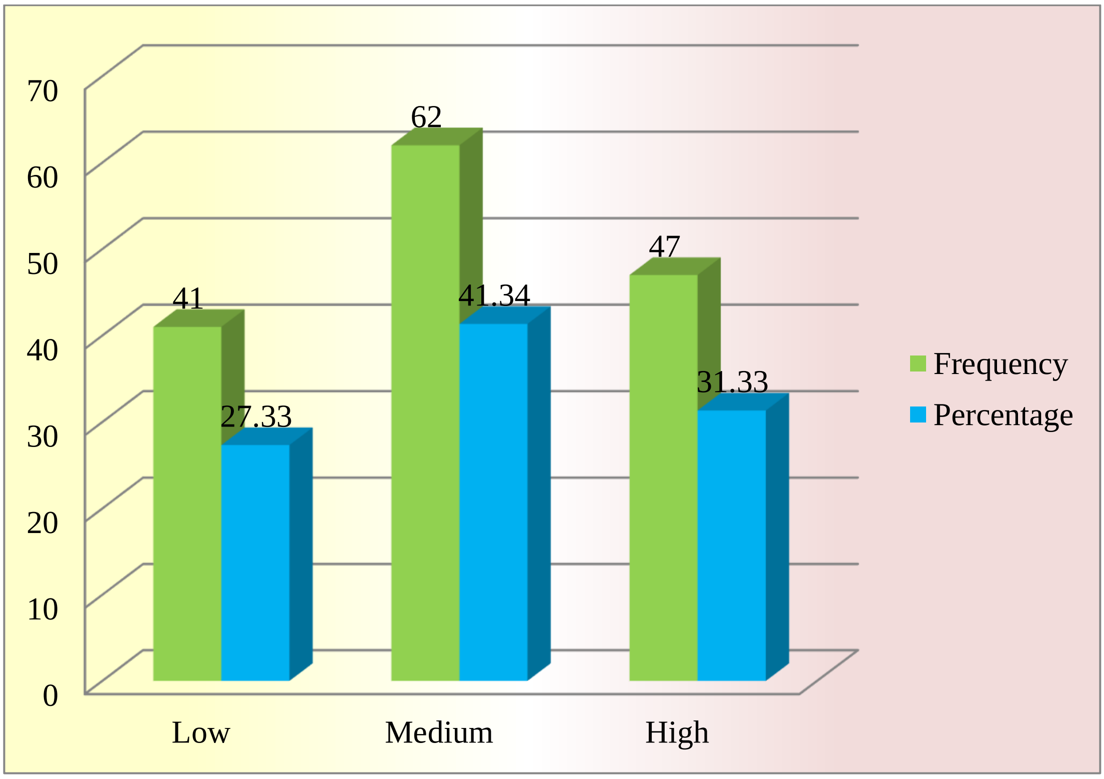


Figure 18: Distribution of the respondents according to their adoption of organic farming practices

Table 16b: Distribution of the farmers according to adoption of organic farming practices

Sr. No.	Organic farming practices	Cropping systems					Overall (N=150)	
		Rice-Fallow land (n=30)	***Rice-Rice (n=30)***	***Rice-Pulses (n=30)***	***Rice-Oilseeds (n=30)***	***Rice-Vegetables (n=30)***	*Frequency*	*Percentage*
1	Minimum /Zero tillage	00 (0.00)	3 (10.00)	7 **(23.33)**	9 **(30.00)**	15 (15.00)	34	22.67
2	Manuring	30 **(100.00)**	30 **(100.00)**	30 **(100.00)**	30 **(100.00)**	30 **(100.00)**	150	**100.00**
3	*Beej Sanskar*/Seed treatment	9 (30.00)	13 (43.33)	9 (30.00)	19 **(63.33)**	23 **(76.67)**	78	**52.00**
4	Bio-mulching	0 (0.00)	7 (23.33)	12 **(40.00)**	18 **(60.00)**	24 **(80.00)**	61	40.67
5	Nutrient management	8 (26.67)	17 (56.67)	19 **(63.33)**	19 **(63.33)**	26 **(86.67)**	89	**59.33**
6	Biopesticides	17 **(56.67)**	18 **(60.00)**	23 **(76.67)**	27 **(90.00)**	29 **(96.66)**	114	**76.00**
7	Inter-cropping / Trap crop	16 **(53.33)**	22 **(73.33)**	23 **(76.67)**	86 **(86.67)**	28 **(93.33)**	115	**76.67**
8	Crop rotation	0 (0.00)	0 (0.00)	30 **(100.00)**	30 **(100.00)**	30 **(100.00)**	90	**60.00**

**Figure in parentheses indicates percentage*

The following section provides an overview of the outcomes associated with the adoption of organic farming methods across different rice-based cropping systems.

Rice-Fallow Land:

In the Rice-Fallow land system, all farmers (100 per cent) universally adopted manuring, as they acknowledged the vital role of nutrient replenishment during the fallow period. The absence of Minimum/Zero Tillage practices in this system (0.00 per cent) can be attributed to the prevailing practice of allowing the land to lie fallow where tillage practices may be limited. A significant proportion of farmers (56.67 per cent) utilized biopesticides, reflecting a substantial inclination towards eco-friendly pest management techniques during the cultivation and fallow phases.

Rice-Rice:

Within the Rice-Rice system, a substantial number of farmers (43.33 per cent) adopted the Beej Sanskar/Seed Treatment, indicating a keen interest in enhancing seed quality and crop resilience in subsequent rice cycles. Bio-mulching practices were observed in 23.33 per cent of the cases, suggesting selective adoption, possibly influenced by weed suppression and moisture conservation.

***Rice-Pulses**:*

It is noteworthy that 23.33 per cent of farmers opted for Minimum/Zero Tillage, which reflects their awareness of the importance of soil conservation practices, especially relevant for pulse cultivation. Additionally, 76.67 per cent of the farmers embraced inter-cropping/trap crop practices, which demonstrates a strategic approach to pest management within a diversified cropping system that involves pulses.

Rice-Oilseed:

It was observed that 40.00 per cent of farmers had adopted bio-mulching, which indicates their recognition of the benefits of this practice for weed control and moisture retention, particularly in the context of oilseed cultivation. Furthermore, all farmers (100.00 per cent) adopted crop rotation practices, which highlights the universal understanding of the importance of this practice in breaking pest cycles and enhancing soil health.

Rice-Vegetables:

A high adoption rate (76.67 per cent) of Beej Sanskar/Seed Treatment suggests that farmers collectively recognize the positive impact of this practice on germination and disease resistance in vegetable crops. Additionally, 86.67 per cent of farmers adopted nutrient management practices, which are essential for meeting the high nutrient demands associated with vegetable cultivation.

The results of the study indicate that manuring practices have been universally adopted across all cropping systems, highlighting their crucial role in enriching the soil and promoting crop nutrition in organic farming. A substantial majority of farmers have also embraced the use of biopesticides, demonstrating a shift towards sustainable practices for pest management. Additionally, crop rotation practices have been adopted by 60.00 per cent of farmers, particularly in the rice–oilseed system, showcasing a recognized strategy for breaking pest cycles and enhancing soil health. Overall, these results reflect a commitment to essential organic farming practices with a balance between universally acknowledged methods and context-specific preferences tailored to diverse cropping systems.

The findings of this study agree with previous research on organic farming practices. Adesope*et.al.* (2012) and Naik *et.al.* (2012) previously identified practices such as crop rotation, mixed cropping, intercropping, and the use of organic materials like compost and leaves, which align with the results of present study. Motiwale (2017) and Mahant *et.al.* (2018) also reported varying adoption levels, which is consistent with the current findings. Ahmed (2019) and Masud Parvez *et.al.* (2018) similarly emphasized the diverse adoption scenarios within the organic farming community. Studies by Malviya *et.al.* (2020), Nisha Yadav (2020), and Bakar *et.al.* (2021) further support the prevalence of medium adoption, which aligns with this study's identification of a significant proportion of farmers falling into this category. However, Sahoo *et.al.* (2021) contrasted this trend by focusing specifically on the adoption levels of biofertilizers and biopesticides, indicating higher medium-level adoption percentages compared to other practices. This contrast underscores the nuanced nature of adoption across different facets of organic farming practices and highlights the importance of considering specific practices when assessing the overall adoption patterns.

4.3 Theory of planned behaviour (TPB): Analysing Behavioural Constructs

Data gathered on the various constructs of the extended theory of planned behavior were obtained. These data were then analyzed and are presented in Table 17. As shown in Table 17, the majority (63.81 per cent) of organic farmers belonged to the 'medium' category of intention, followed by 18.42 per cent in the 'high' category and 16.67 per cent in the 'low' category. Additionally, 69.33 per cent of respondents were found in the "neutral" category of attitude, with 16.00 per cent in the "favourable" category and 14.67 per cent in the 'unfavourable' category.

Table 17: Distribution of the respondents according to their response to constructsunder extended TPB

Sl. No	Particular	Frequency	Percentage
a.	**Intention (I)**		
i.	Low (Up to12)	25	16.67
ii.	Medium (13 to 17)	97	63.81
iii.	High (18 and above)	28	18.42
	Mean= 15.18 Max= 20	Min= 5	SD=3.53
b.	**Attitude (A)**		
i.	Unfavourable (Up to 11)	22	14.67
ii.	Neutral (12 to 17)	104	69.33
iii.	Favourable (18 and above)	24	16.00
	Mean=14.42 Max= 20	Min=4	SD=3.52
c.	**Subjective Norms (SN)**		
i.	Average (Up to 10)	30	20.00
ii.	Good (11 to 16)	104	69.33
iii.	Very good (17 and above)	16	10.66
	Mean= 13.06 Max= 20	Min= 4	SD=3.51
d.	**Perceived behavioural control (PBC)**		
i.	Average (Up to 11)	19	12.67
ii.	Good (12 to 17)	110	73.33
iii.	Very good (18 and above)	21	14.00
	Mean= 14.44 Max= 20	Min= 5	SD=3.40
e.	**Health Consciousness (HC)**		
i.	Low (Up to 11)	25	16.67
ii.	Medium (12 to 18)	87	58.00
iii.	High (19 and above)	38	25.33
	Mean= 15.10 Max= 20	Min= 4	SD=3.88
f.	**Food Security Concerns (FSC)**		
i.	Low (Up to 11)	21	14.00
ii.	Medium (12 to 17)	114	76.00
iii.	High (18 and above)	15	10.00
	Mean= 14.05 Max= 20	Min= 4	SD=3.17
g.	**Marketability(M)**		
i.	Low (Up to 11)	25	16.67
ii.	Medium (12 to 17)	108	72.00
iii.	High (18 and above)	17	11.33
	Mean= 14.14 Max= 20	Min= 4	SD=3.5

In terms of subjective norms, a significant (69.33 per cent) of the respondents were classified in the 'good' category, followed by 20.00 per cent and 10.67 per cent in the 'average' and 'very good' categories, respectively. In the domain of perceived behavioral control, 73.33 per cent of the respondents fell into the 'good' category, with 14.00 per cent and 12.67 per cent found in the 'very good' and 'average' categories, respectively, concerning the adoption of organic farming. Likewise, 58.00 per cent of respondents exhibited a 'medium' level of response to health consciousness, with 25.33 per cent and 16.67 per cent expressing 'high' and 'low' levels of health consciousness, respectively.

Concerning food security, 76.00 per cent of respondents reported a 'medium' level of food security concerns. In contrast, 14.00 per cent and 10.00 per cent acknowledged 'low' and 'high' levels of food security concerns, respectively. Moving on to marketability as a determinant for adopting organic farming, the majority (72.00 per cent) of respondents provided a 'medium' response, while 16.67 per cent and 11.33 per cent expressed 'low' and 'high' responses, respectively.

This indicates that farmers generally exhibit a moderate to positive inclination and attitude toward the adoption of organic farming. Subjective norms, perceived behavioral control, health consciousness, food security concerns, and marketability exert diverse yet substantial influences on their decision-making processes.

4.4 Partial Least Square- Structural equation modelling using SMART-PLS

In this segment, the outcomes of the PLS-SEM analysis are presented and elaborated upon under the following subheadings.

4.4.1 Rationale for Employing the Partial Least Squares Structural Equation Modeling (PLS-SEM) Approach

The utilization of Partial Least Squares Structural Equation Modeling (PLS-SEM) has garnered notable favour within the structural equation modeling domain owing to its distinctive attributes and adaptability. The decision to employ PLS-SEM as the primary modeling approach is underpinned by several compelling justifications. In contrast to its counterpart, Covariance-Based SEM (CB-SEM), PLS-SEM demonstrates particular efficacy in situations characterized by constrained sample sizes and intricate multivariate relationships among variables (Henseler, Ringle and Sarstedt, 2015). Its resilience in handling non-normally distributed data and outliers renders it an invaluable instrument for researchers confronted with real-world datasets that frequently diverge from the stringent assumptions of CB-SEM (Hair, Hult, Ringle and Sarstedt, 2017). Furthermore, PLS-SEM's emphasis on predictive accuracy positions it as the method of choice for predictive modeling, particularly in disciplines where forecasting and understanding latent relationships are paramount (Chin, 1998).

Moreover, PLS-SEM provides enhanced flexibility in dealing with formative constructs and imposes fewer exacting requirements on the measurement model (Diamantopoulos and Winklhofer 2001). This elucidation establishes the groundwork for comprehending the rationale behind selecting PLS-SEM as the preferred modeling approach, underscored by its adaptability and suitability in the current study.

4.4.2 Descriptive statistics of the latent variables under PLS-SEM

In the present study, we have identified seven constructs within the framework of the extended Theory of Planned Behavior (TPB) to evaluate farmers' behavioral intentions. Table 18 provides a comprehensive overview of the descriptive statistics of each latent construct. This table serves as a valuable resource for gaining insight into the fundamental characteristics and distributions of the chosen constructs, thereby illuminating the variables pivotal in predicting farmers' intentions and behaviors.

Table 18 depicts the measured values for each item, encompassing the minimum and maximum values along with the mean, median, standard deviation, kurtosis, and skewness. The respondents evaluated the items on a five-point scale ranging from strongly disagree to strongly agree, with corresponding scores ranging from 1 to 5. This score was reversed for negatively rated items. The minimum and maximum observed values for each item were 1 and 5, respectively.

With regard to the latent construct 'intention' (I), comprised of four items (Item code-I1 to I4), it is evident that the item 'I believe the adoption of organic agricultural practices improves the quality of farm produce' achieves the highest mean (4.1), suggesting a favorable view of the quality of organic produce attributable to the absence of chemical inputs. The item 'Health-related factors influence my decision to engage in organic agriculture" earned an average score of 4.0, emphasizing a dedication to adopting organic farming practices motivated by health and well-being considerations. Additionally, the items 'I think organic agriculture is the only way to preserve our culture and traditions' (mean=3.9) and 'I am sure that transitioning to organic agriculture means reducing your farm income' (mean=3.6) convey a strong commitment to cultural preservation through organic farming, despite recognizing a potential income reduction as a consequence.

Table 18: Descriptive statistics of latent variable under PLS-SEM

Sl. No	Construct	Item Code	Item	Mean	Med	Scale min	Scale max	Observed min	Observed max	SD	Excess kurtosis	Skew-ness	Cramér-von Mises p value
1	Intention	I1	I adopt organic agricultural practices to provide my family with toxin-free food.	3.9	4	1	5	1	5	0.9	1.968	-1.3	0
		I2	I believe the adoption of organic agricultural practices improves the quality of farm produce.	4.1	4	1	5	1	5	1.0	0.274	-1.0	0
		I3	I only practice organic agriculture because I want to reap the benefits of government schemes.	3.7	4	1	5	1	5	1.0	-0.101	-0.78	0
		I4	Health-related factors influence my decision to engage in organic agriculture.	4.0	4	1	5	1	5	0.9	1.032	-1.16	0
2.	Attitude	A1	Wherever I go, I emphasize the importance of practicing organic agriculture.	3.8	4	1	5	1	5	0.9	0.422	-0.87	0
		A2	I feel that transitioning from an 'inorganic farm' to an 'organic farm' is a waste of time. *	3.8	4	1	5	1	5	1.1	-0.457	-0.80	0
		A3	I think organic agriculture is an only way to preserve our cultureand traditions.	3.9	4	1	5	1	5	0.9	1.025	-0.98	0

Sl. No	Construct	Item Code	Item	Mean	Med	Scale min	Scale max	Observed min	Observed max	SD	Excess kurtosis	Skew-ness	Cramér-von Mises p value
		A4	I am sure that transitioning to organic agriculture means reducing your farm income*	3.6	4	1	5	1	5	1.1	-0.945	-0.55	0
3	Subjective norms	SN1	I respect the opinions of those who think organic agriculture is advantageous.	3.7	4	1	5	1	5	0.9	0.232	-0.86	0
		SN2	There is a continuous demand from my family to adopt organic agriculture.	3.3	4	1	5	1	5	1.0	-0.812	-0.41	0
		SN3	The concept of group farming has influenced me to adopt organic agriculture.	3.9	4	1	5	1	5	0.9	1.682	-1.36	0
		SN4	When I talk with fellow farmers about organic agriculture, I get positive responses.	3.5	4	1	5	1	5	0.9	-0.082	-0.54	0
4	Perceived behavioural control	PBC1	I am capable of managing my farm in accordance with the prescribed organic standards.	3.8	4	1	5	1	5	0.9	1.068	-1.11	0
		PBC2	I have a social network that supports successful engagement in organic agriculture.	3.3	4	1	5	1	5	1.0	0.160	-0.69	0
		PBC3	I believe that adopting organic agricultural practices is beyond my	3.3	3	1	5	1	5	1.0	-0.721	-0.13	0

Sl. No	Construct	Item Code	Item	Mean	Med	Scale min	Scale max	Observed min	Observed max	SD	Excess kurtosis	Skew-ness	Cramér-von Mises p value
			economic condition. *										
		PBC4	I have trust in my ability to overcome obstacles while adopting organic agriculture.	3.7	4	1	5	1	5	1.0	0.265	-0.80	0
5.	Health consciousness	HC1	My family can consume safe food if I practice organic agriculture.	4.0	4	1	5	1	5	1.0	0.957	-1.20	0
		HC2	I like to eat organic food due to its distinct taste.	3.7	4	1	5	1	5	1.0	-0.070	-0.74	0
		HC3	I believe that practicing organic agriculture is incompatible with my health-conscious lifestyle. *	3.5	4	1	5	1	5	1.8	-0.905	-0.37	0
		HC4	Our forefathers had long lives because they consumed organic food.	4.0	4	1	5	1	5	1.0	0.831	-1.16	0
6	Food security concerns	FSC1	I feel that engaging in organic agriculture has helped me enough food for my family.	3.7	4	1	5	1	5	0.8	1.031	-0.95	0
		FSC2	I think relying solely on organic agriculture could lead to food crises in the country. *	3.6	4	1	5	1	5	1.0	-0.286	-0.58	0
		FSC3	Promoting organic agriculture is essential to ensure food security for next-generations.	3.7	4	1	5	1	5	0.9	0.621	-0.95	0

Sl. No	Construct	Item Code	Item	Mean	Med	Scale min	Scale max	Observed min	Observed max	SD	Excess kurtosis	Skew-ness	Cramér-von Mises p value
		FSC4	Organic agriculture can enhance food security by fostering local food systems.	3.1	3	1	5	1	5	1.6	-1.181	-0.05	0
7	Marketability	M1	Consumers are willing to pay a premium for organically grown agricultural products.	3.9	4	1	5	1	5	1.9	0.340	-1.01	0
		M2	The rising market demand for organic products led me to adopt organic agriculture.	3.4	4	1	5	1	5	1.1	-0.281	-0.64	0
		M3	There is a high demand for organic agricultural products in food malls and supermarkets.	3.8	4	1	5	1	5	1.7	0.487	-0.88	0
		M4	Organic agricultural products have a competitive advantage over conventional products.	3.6	4	1	5	1	5	1.3	0.109	-0.81	0

* Indicates negative statements

In the context of subjective norms, the items 'The concept of group farming has influenced me to adopt organic agriculture' (mean=3.9) and 'When I talk with fellow farmers about organic agriculture, I get positive responses' (mean=3.6) indicate that the intention to adopt organic farming is likely influenced by a range of factors, including peer support, knowledge sharing, collective learning, risk-sharing, community values, and potential economic benefits. The item with a mean score of 3.8, 'I am capable of managing my farm in accordance with the prescribed organic standards,' suggests that specific skills are necessary for managing organic farming. Conversely, the statement 'I believe that adopting organic agricultural practices is beyond my economic condition' (mean=3.3) suggests that the perceived cost of organic certification and renewal exceeds the financial capacity of farmers.

Regarding health consciousness, the mean score of 4.0 for the item 'Health benefits and longevity associated with organic food' highlights the perceived positive health implications of consuming organic food. The item 'I feel that engaging in organic agriculture has helped me produce enough food for my family' (mean=3.7) indicates confidence in the sufficiency of yield from organic farming.

In evaluating the marketability of the item 'Consumers are willing to pay a premium for organically grown agricultural products,' the mean score obtained is 3.9. This finding suggests that the price of organic produce is higher than that of conventional farm produce.

4.2.2 Measurement model

The measurement model is of paramount significance in the examination of latent constructs and their corresponding indicators. In the realm of PLS-SEM, the measurement model functions as the initial step in assessing the validity and reliability of the measurement instrument utilized to operationalize constructs. It establishes the relationships between the observed indicators and their corresponding latent constructs, facilitating the evaluation of the measurement quality.

4.4.2.1 Exploratory factor analysis/Outer loadings

In conducting a Partial Least Squares Structural Equation Modeling (PLS-SEM) assessment using SMART-PLS, the present study aimed to elucidate the relationships between constructs and their corresponding indicator variables. To this end, seven reflective measurement constructs were employed. The measurement model was tasked with scrutinizing the outer loadings of the reflective indicators or items, as outlined in Table 19 and Figure 20. Outer loading signifies the degree to which each item or indicator in the correlation matrix correlates with the given principal component. This value can vary between -1.0 and +1.0, with higher absolute values indicating a stronger correlation of the item with the underlying factor (Pett *et.al.*, 2003). For a reflective indicator or item, the outer loading factor must be statistically significant, and the standard outer loading value should exceed 0.70 (Hair *et.al.*, 2016).

Table: 19. Outer loadings, multicollinearity, reliability, and validity of the constructs and reflective indicators

Construct	**Item Code**	**Factor/ Outer loadings**	**Variance Inflation Factor (VIF)**	**Reliability Analysis**		**Convergent validity – Average Variance Extracted (AVE)**
				Cronbach Alpha	**Composite Reliability (Rho_a)**	
Intention	I1	0.892	4.152	0.889	0.890	0.751
	I2	0.863	2.329			
	I3	0.804	1.842			
	I4	0.905	4.162			
Attitude	A1	0.849	2.546	0.860	0.875	0.706
	A2	0.884	2.565			
	A3	0.727	1.965			
	A4	0.890	2.978			
Subjective Norms	SN1	0.849	2.097	0.889	0.907	0.748
	SN2	0.818	2.316			
	SN3	0.871	2.322			
	SN4	0.917	3.767			
Perceived Behavioural Control	PBC1	0.853	2.678	0.905	0.922	0.780
	PBC2	0.936	4.370			
	PBC3	0.931	3.908			
	PBC4	0.807	2.413			
Health Conciousness	HC1	0.883	2.819	0.888	0.898	0.750
	HC2	0.864	2.388			
	HC3	0.781	1.823			
	HC4	0.930	3.861			
Food Security Concerns	FSC1	0.770	1.815	0.799	0.800	0.624
	FSC2	0.786	2.301			
	FSC3	0.779	2.059			
	FSC4	0.824	2.595			
Marketability	M1	0.854	2.388	0.827	0.830	0.659
	M2	0.765	1.637			
	M3	0.824	1.939			
	M4	0.803	1.941			

Initially comprising 40 indicators, the measurement model was refined by eliminating 12 reflective indicators with low outer-loading values (<0.70) for the corresponding construct. This strategic exclusion enhances the quality and predictive relevance of the structural models. Substantial improvements were observed in the internal consistency, convergent validity, and discriminant validity of the measurement constructs.

Consequently, the final structural model was constructed using indicators or items that exhibited an outer loading that exceeded 0.7. The ultimate model comprised 28 indicators distributed among attitude (A1 to A4) and intention (I1 to I4) constructs, subjective norms (SN1 to SN4), perceived behavioral control (PBC1 to PBC4), health consciousness (HC1 to HC4), food security concerns (FSC1 to FSC4), and marketability (M1 to M4). Notably, the outer loadings of all these indicators under their respective constructs surpass the 0.70 threshold, as detailed in Table 20 and Figure 21.

4.4.2.2 Multicollinearity Assessment in the Outer Model

The assessment of multicollinearity within the outer model of Partial Least Squares Structural Equation Modeling (PLS-SEM) constitutes a vital aspect of the analytical process. Multicollinearity occurs when indicators within a latent construct show high correlation, potentially complicating the interpretation of the model's outcomes. The Variance Inflation Factor (VIF) is widely employed as a metric to evaluate multicollinearity. According to Hair *et.al.* (2017), VIF values exceeding 5 or 10 suggest substantial variance inflation owing to correlated indicators, which may significantly impact the estimated regression coefficients. In contrast, tolerance, which is the reciprocal of the VIF, provides a complementary perspective. Tolerance values below 0.1 indicate pronounced multicollinearity. Moreover, correlations exceeding 0.8 between pairs of indicators raise concerns about multicollinearity within the construct.

Identifying and addressing multicollinearity is essential because it can distort the distinctiveness of each indicator's contribution to the latent construct, compromising the precision of parameter estimates and resulting in inflated standard errors.A critical look at Table 20 indicates that all VIF values for each indicator were below five, indicating a lack of strong correlation among the indicators and distinct relationships with the latent constructs.

4.4.2.3 Reliability analysis

In Partial Least Squares Structural Equation Modeling (PLS-SEM), reliability analysis holds foundational importance as it aims to assess the internal consistency and reliability of measurement constructs within the research model. This process entails an evaluation of the extent to which observed indicators accurately and consistently measure latent constructs, thereby ensuring the robustness of the measurement model. As emphasized by Henseler, Ringle, and Sarstedt (2015) that reliability is a key requirement of construct measurement, as measurement errors can substantially compromise the quality of PLS-SEM results.

Cronbach's alpha, a measure of internal consistency, provides valuable insights into the degree of association between the observed indicators within each construct. In Table 20, it is evident that all constructs exhibited strong internal consistency, with Cronbach's alpha values ranging from 0.799 to 0.905. These values surpassed the widely accepted threshold of 0.7, confirming that the indicators within each construct reliably measured the same underlying trait.

Composite reliability, as indicated by both rho_a and rho_c, served as an additional measure of internal consistency. The results in Table 20 demonstrate high levels of internal consistency with values ranging from 0.800 to 0.934. These values comfortably exceeded the recommended threshold of 0.7, providing robust evidence of the reliability of the constructs.

Average Variance Extracted (AVE) measures the proportion of variance captured by the observed indicators in relation to the total variance of the construct. In Table 20, AVE values ranging from 0.624 to 0.780 surpassed the widely accepted threshold of 0.5. This suggests that a substantial portion of the variance in the observed indicators is attributable to the underlying latent construct rather than measurement error.

To evaluate consistency among instrument items, internal consistency reliability was assessed using two widely employed methods: Cronbach alpha and composite reliability (Mark 1996). The values presented in Table 20 demonstrate that both Cronbach alpha and composite reliability exceed the required threshold of 0.70 (Hair *et.al.* 2011). Notably, the composite reliability statistic, ranging from 0.857 to 0.994, and Cronbach's alpha, ranging from 0.824 to 0.919 (refer to Table 20), collectively indicate that all constructs have established satisfactory internal consistency reliability.

4.4.2.4 Convergent validity

Convergent validity is crucial in the context of PLS-SEM, as it measures the extent to which observed indicators within a latent construct effectively assess the same underlying concept or construct. As highlighted by Hair, Hult, Ringle, and Sarstedt (2017), convergent validity is the degree to which multiple measures of the same construct are related. It is assumed that the valid measures of a concept should exhibit high covariance when multiple measures are used (Bagozzi *et.al.*, 1991).

The assessment of convergent validity commonly employs the Average Variance Extracted (AVE), where an AVE value equal to or greater than 0.50 indicates that the items effectively converge to measure the underlying construct, thereby establishing strong convergent validity (Fornell and Larcker, 1981). In this study, AVE values were computed using the PLS-SEM algorithm implemented in Smart-PLS. As shown in Table 20, the Average Variance Extracted (AVE) value for each construct exceeded the acceptable threshold of 0.5. Therefore, convergent validity was established (Henseler *et.al.*,, 2016).

4.4.2.5 Discriminant validity

As Hair *et.al.*, (2019) posit, discriminant validity refers to the extent to which concepts exhibit empirical distinctiveness within a structural model. The fundamental principle underlying this concept is that, if two or more concepts are distinct, their respective valid measures should not exhibit excessively high correlations (Bagozzi *et.al.*,, 1991). This study employs two methodologies, namely, the Fornell-Larcker criterion, cross loadings, and the Heterotrait Monotrait ratio (HTMT), to rigorously establish discriminant validity.

Fornell and Larcker criterion:

The current study employed the Fornell-Larcker criterion to assess discriminant validity. Following the guidelines set forth by Fornell and Larcker (1981), discriminant validity was established when the square root of the average variance extracted (AVE) for a construct surpassed its correlation with all other constructs. Upon scrutiny of Table 20, it is evident that the square root of AVE (highlighted in bold and italics) for each construct exceeded its correlation with the other constructs. This observation provides robust evidence that supports the confirmation of discriminant validity.

Table 20.AVE square roots (diagonal) and construct correlations for assessing the Fornell-Larcker criterion

Construct	A	FSC	HC	I	M	PBC	SN
A	**0.840**						
FSC	0.632	**0.790**					
HC	0.692	0.591	**0.866**				
I	0.795	0.692	0.767	**0.867**			
M	0.682	0.644	0.768	0.710	**0.812**		
PBC	0.726	0.635	0.675	0.796	0.701	**0.883**	
SN	0.593	0.781	0.637	0.775	0.596	0.730	**0.865**

Note: *Bold and Italics represent the square-root of AVE*

Cross loadings:

Discriminant validity is deemed appropriate when the outer loading value of a variable exceeds all loadings of the cross-loading values of other variables. In essence, cross-loadings aid in assessing whether an item associated with a specific construct exhibits robust loading onto its designated parent construct, as opposed to other constructs. As shown in Table 21, the bolded outer loadings for each variable consistently surpass their respective cross-loadings with the other variables (Wasko and Faraj, 2005). Hence, the evaluation of cross-loadings supports the assertion that discriminant validity was duly established in this study.

Table 21. Cross loadings of the items

Construct	A	FSC	HC	I	M	PBC	SN
A2	**0.849**	0.621	0.642	0.713	0.624	0.603	0.454
A3	**0.884**	0.570	0.630	0.762	0.583	0.611	0.588
A5	**0.727**	0.389	0.450	0.514	0.501	0.558	0.425
A7	**0.890**	0.512	0.579	0.652	0.573	0.670	0.518
FSC3	0.478	**0.770**	0.448	0.626	0.478	0.482	0.722
FSC5	0.508	**0.786**	0.385	0.450	0.503	0.482	0.579
FSC6	0.515	**0.779**	0.532	0.565	0.569	0.518	0.596
FSC8	0.497	**0.824**	0.493	0.531	0.484	0.524	0.558
HC1	0.568	0.532	**0.883**	0.708	0.663	0.583	0.581
HC5	0.543	0.536	**0.864**	0.653	0.621	0.547	0.540
HC6	0.667	0.476	**0.781**	0.563	0.658	0.607	0.467
HC8	0.638	0.505	**0.930**	0.720	0.721	0.609	0.606
I2	0.657	0.563	0.592	**0.892**	0.529	0.646	0.739
I3	0.666	0.561	0.738	**0.863**	0.683	0.704	0.617
I6	0.674	0.689	0.631	**0.804**	0.625	0.686	0.633
I9	0.755	0.584	0.690	**0.905**	0.617	0.718	0.698
M1	0.456	0.513	0.684	0.571	**0.854**	0.597	0.505
M4	0.557	0.396	0.608	0.522	**0.765**	0.536	0.414
M5	0.577	0.535	0.688	0.621	**0.824**	0.565	0.500
M7	0.613	0.631	0.518	0.585	**0.803**	0.576	0.508
PBC1	0.555	0.488	0.520	0.716	0.522	**0.853**	0.694
PBC3	0.655	0.558	0.646	0.718	0.696	**0.936**	0.670
PBC6	0.756	0.641	0.688	0.799	0.670	**0.931**	0.676
PBC8	0.584	0.560	0.509	0.547	0.585	**0.807**	0.518
SN10	0.580	0.729	0.657	0.732	0.597	0.665	**0.849**
SN2	0.432	0.688	0.367	0.519	0.339	0.505	**0.818**
SN3	0.592	0.648	0.627	0.784	0.559	0.688	**0.871**
SN5	0.396	0.637	0.474	0.574	0.504	0.624	**0.917**

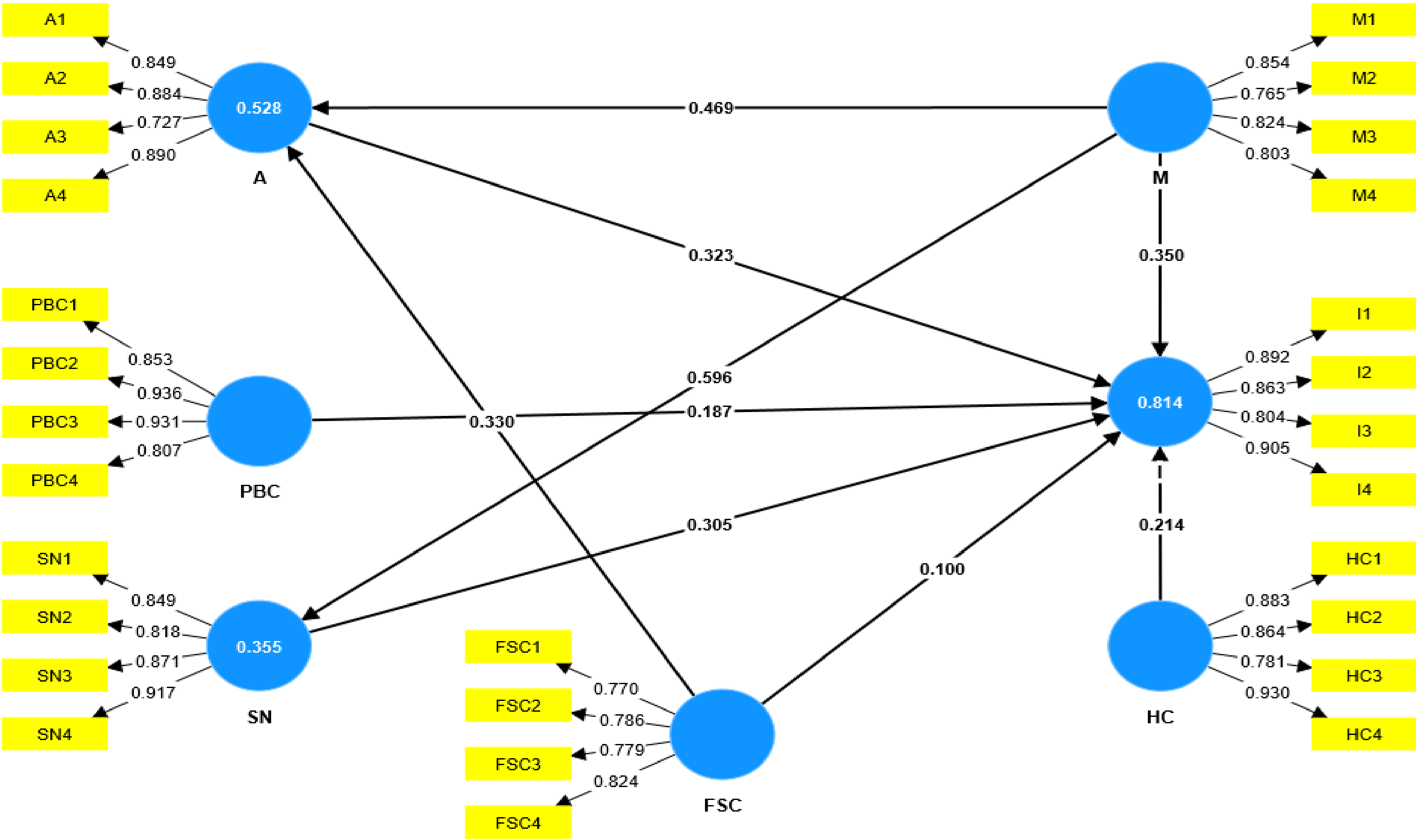


Figure 19. Structural model of PLS-SEM showing showing outer loadings

Heterotrait- Monotrait (HTMT) ratio:

Discriminant validity between two reflective constructs was deemed established when the heterotrait-monotrait (HTMT) value was below 0.90, as proposed by Henseler *et.al.,* (2015). The results of the HTMT analysis, presented in Table 22, indicate that the HTMT ratio is generally below the stipulated threshold of 0.90, except for the relationships 'M to HC' and 'SN to FSC.'

Table 22. Heterotrait-monotrait ratio (HTMT)

Construct	**A**	**FSC**	**HC**	**I**	**M**	**PBC**	**SN**
A							
FSC	**0.753**						
HC	**0.792**	**0.700**					
I	**0.899**	**0.815**	**0.859**				
M	**0.803**	**0.785**	0.900	**0.824**			
PBC	**0.822**	**0.748**	**0.752**	**0.877**	**0.810**		
SN	**0.660**	**0**.921	**0.688**	**0.849**	**0.671**	**0.794**	

Based on the Fornell-Larcker criterion, Cross-loading values, and HTMT ratio, it can be summarized that discriminant validity has been effectively established.

4.4.3 Structural Model Assessment

Once the reliability and validity of the exterior models' measurements have been established, efforts are directed towards the evaluation of the structural or inner models. This process involves scrutinizing the predictive capabilities of the model and examining the interrelationships among its components, as outlined by Hair *et.al.,* (2019). In essence, the evaluation of the structural model aims to empirically test the hypothesized relationships within the inner model. The measurement model, illustrated in Figure 22, incorporated independent, dependent, and mediating variables. The postulated relationships among constructs in the current analyses were assessed through three key criteria: the Coefficient of Determination (R2) of endogenous constructs, Effect Size ($f2$), and Path Coefficients.

4.4.3.1 Coefficient of determination (R^2)

The coefficient of determination, commonly referred to as R^2, is a measure of the extent to which an appropriate model captures the variation in dependent variables. Essentially, this determines the predictive ability of a model. A higher R^2 value indicated a stronger structural model for forecasting future outcomes. The primary objective of PLS-SEM is to improve R^2 as the aim is to explain the endogenous latent variable. As per Hair *et.al.,* (2019), the R^2 values ranged from 0 to 1, with values of 0.75, 0.50, and 0.25, indicating strong, moderate, and modest predictive accuracy, respectively. Table 23 presents the R^2 values for the endogenous constructs.

Table 23. Coefficient of determination (R^2)

Construct	R Square	R Square Adjusted	Effect
Attitude	0.528	0.522	Moderate
Intention	0.814	0.806	Strong
Subjective Norms	0.355	0.351	Small

The results depicted in Table 23 show that the R-squared value of 0.528 for the attitude construct indicates approximately 52.8 per cent of the variance in attitude. This suggests that the independent variables included in the model contribute significantly to predicting farmers' attitudes towards the adoption of organic farming. The adjusted R-squared value of 0.522 accounts for the complexity of the model and provides a slightly lower but still meaningful estimate.

The high R-squared value of 0.814 for the intention construct indicated that the regression model for intention explained a substantial proportion (approximately 81.4 per cent) of the variance in this construct. This suggests that the independent variables included in the model have a strong explanatory power in predicting farmers' intentions. The adjusted R-squared value of 0.806, which is slightly lower than the R-squared value, accounts for the model's complexity and reflects a robust level of explained variance. This indicates a strong relationship between the predictors and the intention construct.

The R-squared value of 0.355 for the Subjective Norms construct indicated that the regression model explained approximately 35.5 per cent of the variance in Subjective Norms. This suggests that the independent variables have limited explanatory power for predicting farmers' subjective norms. The adjusted R-squared value of 0.351, which is consistent with the R-squared value, maintained a small level of explained variance. It indicates a relatively weaker relationship between the predictors and farmers' subjective norms.

4.4.3.2 Effect size (f^2)

Furthermore, the R^2 values of every endogenic component and the effect size of a predictor latent construct at the structural level were studied to assess model fitness in the current work.

Table 24. The results for effect size (f^2)

Sl. No	Path	f-square	Effect
1.	Attitude →.Intention	0.205	Moderate
2.	Subjective Norms →Intention	0.140	Small
3.	Perceived Behavioural Control →Intention	0.057	Small
4.	Health Consciousness → Intention	0.081	Small
5.	Food Security Concerns → Intention	0.000	No effect
6.	Marketability →Intention	0.000	No effect
7.	Food Security Concerns-→Attitude	0.135	Small
8.	Marketability → Attitude	0.273	Moderate
9.	Marketability → Subjective Norms	0.550	Strong

The F-squared values within the structural model of PLS-SEM analysis offer valuable insights into the strength and impact of inter-construct relationships. First, the attitude construct elucidates approximately 20.5 per cent of the variance in farmers' intentions, indicative of a moderate level of influence, where farmers' attitudes play a meaningful role in shaping their intentions. Similarly, the Food Security Concerns construct, with an F-square of 0.135, moderately influenced farmers' attitudes, explaining approximately 13.5 per cent of the variance in attitudes. It is noteworthy that this construct did not significantly elucidate the variance in farmers' intentions (F-square = 0.000), suggesting a potentially weak predictive capacity for intentions.

Additionally, Health Consciousness moderately influenced farmers' intentions, explaining approximately 8.1 per cent of the variance. Conversely, Marketability significantly shapes farmers' attitudes, boasting an F-square of 0.273 and elucidating about 27.3 per cent of the variance in attitudes. However, Marketability did not emerge as a robust predictor of intention (F-square = 0.000).

By contrast, marketability exerts a substantial impact on Subjective Norms, explaining approximately 55 per cent of the variance, underscoring a robust relationship between marketability and farmers' Subjective Norms. Finally, Perceived Behavioral Control exhibits a relatively modest impact on predicting intentions, explaining approximately 5.7 per cent of the variance, whereas Subjective Norms moderately affects intentions, accounting for approximately 14 per cent of the variance.

These findings collectively elucidate the varying degrees of influence that different constructs exert on each other within the model, providing a nuanced understanding of the relationships among these variables in the context of farmers' behavioral intentions.

4.4.3.3 Model fit

The Standardized Root Mean Square Residual (SRMR) criterion was employed to verify the absence of misspecification in the mixed model incorporating reflective and formative constructs. SRMR evaluates the disparities between the observed correlation matrix derived from the sample and the anticipated correlation matrix predicted by the model. The SRMR value of 0.079 in the saturated model exceeded the established threshold of 0.080, indicating a commendable fit of the model according to the criteria established by Henseler *et.al.,* (2016). Furthermore, all model fitness indicators, including the Normed Fit Index (NFI) and chi-square, exhibited values deemed acceptable in comparison to the established cutoff values.

Table 25. Model fit

Particulars	Appropriate	Saturated model	Estimated model
SRMR	<0.080	0.076	0.080
d_ULS		2.462	2.833
d_G		0.21	0.28
NFI	>0.90	0.96	0.98
Chi square		960.36	989.52

The Standardized Root Mean Square Residual (SRMR) is a vital metric for evaluating the disparity between the observed correlations and those anticipated by the model. For both the estimated model (SRMR = 0.080) and saturated model (SRMR = 0.076), the SRMR values fell below the generally accepted threshold of 0.080. This indicates a commendable fit for both models, signifying their ability to accurately depict inherent relationships within the data.

Dunn's scaled index (d_ULS), a measure of model fit in which smaller values denote superior performance, highlights the superiority of the saturated model. The saturated model exhibits a lower d_ULS value (2.462) than the estimated model (2.833), suggesting a slightly more favorable fit according to this index.

Similarly, the Geodesic Discrepancy Index (d_G), another indicator of fit, favored the saturated model (d_G = 0.21) over the estimated model (d_G = 0.28), implying a marginally better fit for the saturated model.

The Normed Fit Index (NFI), which assesses the extent to which the model fits the data compared to a null model, demonstrates strong performance for both the estimated model (NFI

= 0.98) and saturated model (NFI = 0.96), surpassing the recommended threshold of 0.90. This underscores the robust fit of both the models in effectively capturing the underlying relationships within the data.

The present analysis includes the chi-square statistic (χ^2) for contextual reference; however, its relevance is diminished in the context of PLS-SEM, especially when dealing with non-normally distributed data. Specifically, the Chi-square values for the saturated model and estimated model are 960.36 and 989.52, respectively. Nevertheless, in PLS-SEM, the Chi-square statistic is of secondary importance for determining the fit of a model.

Considering the fit indices presented, both the saturated and estimated models showed noteworthy consistency with the data. The SRMR, d_ULS, d_G, and NFI values collectively reflect a strong concordance between the models and the observed data. Although the Chi-square statistic is considered, its utility in evaluating the model fit in PLS-SEM is relatively limited.

4.4.3.4 Path Coefficients

PLS-SEM employs the path coefficient to assess the magnitude and importance of anticipated connections between latent constructs. The structural model connections were determined using standardized values ranging between −1 and +1. Values closer to +1 indicate a robust positive association, whereas coefficients closer to −1 suggest a strong negative relationship.

4.4.3.4.1 Hypothesis testing

The significance and relevance of the relationships in the structural model were evaluated using a bootstrapping process. Hair *et.al.*, (2017) stipulated that the typically utilized critical values for two-tailed tests are 1.96 (significance level = 5 per cent) and 2.57 (significance level = 1 per cent). When an empirical t-value surpasses the critical value, it is concluded that the coefficient is statistically significant for a specific error probability. The results in Table 26 and Figure 21 depict the path coefficients of the respective constructs, along with their corresponding levels of significance, to validate certain hypotheses. The path coefficient ($\beta = 0.323$) for attitude and intention was reported with a t-value of 2.708, which exceeded the threshold of 2.57. The reported p-value was 0.00, which was considered significant ($p < 0.05$). Consequently, the hypothesis 'Attitude may have a positive influence on intention to engage in organic farming' (H1 Hypothesis) is deemed acceptable. This finding is consistent with those of prior research conducted by Ashari *et.al.,* (2018) and Li *et.al.,* (2020), Buyinza *et.al.,* (2020), and Imani *et.al.,* (2021), all of which also established that farmers' attitudes significantly impact their intentions to adopt organic farming practices.

Table 26. Result of direct relationship between hypothesis testing

Hypothesis	Corresponding Path	Path Coefficient (β)	Standard Deviation (SD)	*T* Statistics	*P* Value	Confidence of Interval		Result?
						2.5 %	97.5 %	
H1	Attitude → Intention	0.323	0.119	2.708	0.007	0.088	0.552	Accepted
H2	Subjective Norms → Intention	0.305	0.072	4.238	0.000	0.172	0.450	Accepted
H3	Perceived Behavioural Control →Intention	0.187	0.091	2.051	0.041	0.031	0.383	Accepted
H4	Health Consciousness → Intention	0.214	0.093	2.297	0.022	0.042	0.404	Accepted
H5	Food Security Concerns → Intention	0.330	0.069	0.091	0.928	-0.155	0.120	Rejected
H6	Marketability →Intention	0.017	0.068	0.245	0.807	-0.137	0.137	Rejected
H7	Food Security Concerns-→Attitude	0.330	0.080	4.120	0.000	0.177	0.487	Accepted
H8	Marketability → Attitude	0.469	0.100	4.673	0.000	0.265	0.645	Accepted
H9	Marketability → Subjective Norms	0.596	0.088	6.774	0.000	0.406	0.737	Accepted

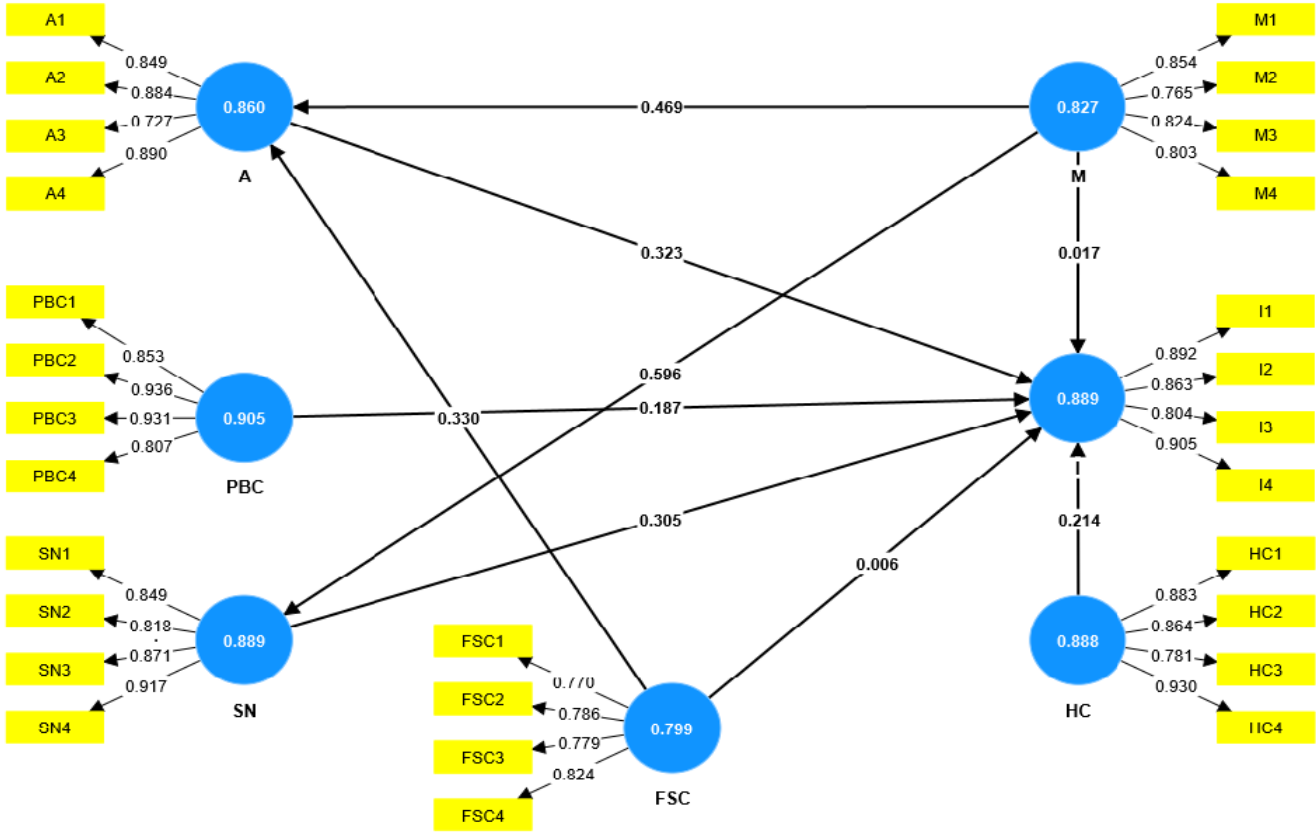


Figure 20. Structural model of PLS-SEM showing path coefficients of inner model

The path coefficient (β) of 0.305, in conjunction with a significantly elevated t-value of 4.238 (well surpassing the critical threshold of 1.96 for conventional significance at $p < 0.05$) and a p-value of 0.000, attests to the robust statistical significance of the observed relationship between subjective norms and intention. This outcome indicates a substantial impact of subjective norms on farmers' intentions to embrace a specific behavior, particularly within the context of adopting organic farming practices. Consequently, this study supports Hypothesis H2. This is consistent with the findings of Buyinza *et.al.,* (2020), Imani *et.al.,* (2021), and Zhllima*et.al.,* (2021) reiterate the positive influence of subjective norms on the intention to adopt organic farming.

Furthermore, the path coefficient (β) of 0.187, accompanied by a statistically significant t-value of 2.051 (exceeding the critical threshold of 1.96, $p < 0.05$) and a p-value of 0.041, underscores the existence of a statistically significant relationship between perceived behavioral control and intention in the context of organic farming adoption. This indicates that as farmers' perceptions of their capability and control over adopting organic farming practices increase, their intention to engage in such practices also experiences significant augmentation. Consequently, Hypothesis H3, positing a positive influence of Perceived Behavioral Control (PBC) on farmers' intentions regarding the adoption of organic agricultural practices, is supported. This finding aligns with similar results reported by Manideep and Reddy (2020), Phaibun Yanakittkul and ChuenjitAungvaravong (2021), and Zhllima*et.al.,* (2021), all of which highlight the positive impact of perceived behavioral control on the intention to adopt organic farming.

The hypothesis positing that health consciousness significantly influences intention is upheld, as evidenced by the statistically significant path coefficient of 0.214 (p-value = 0.022). This indicates a positive correlation between health consciousness and intention, suggesting that individuals with heightened health consciousness are more inclined to have stronger intentions toward the adoption of organic farming. This finding aligns with the results of the studies conducted by Karki *et.al.,* (2011) and Asadollahpour*et.al.,* (2014), Cukur*et.al.,* (2019), and Balla and Goswami (2022), all of which report a significant influence of health consciousness on farmers' intentions to adopt organic farming.

In contrast, hypothesis (H5) proposes that Food Security Concerns (FSC) may positively influence farmers' intention to adopt organic agricultural practices. The non-significant path coefficient of 0.330 (p-value = 0.928) indicated the absence of a substantial relationship between food security concerns and intention. This result diverges from the findings of Meemken and Qaim (2018), who reported evidence supporting the positive influence of food security concerns on farmers' intention to adopt organic agriculture practices.

Regarding hypothesis (H6) suggests that marketability may positively influence farmers' intention to adopt organic agricultural practices, the path coefficient (β) of 0.017, coupled with a high p-value of 0.807, indicates a lack of statistical significance. Consequently, the hypothesis was rejected, implying no substantial relationship between marketability and intention. This result contradicts the findings of Alexopoulos *et.al.,* (2010).

In nutshell, the findings affirm a positive link between health consciousness and intention, challenges the notion that food security concerns positively impact intention, and rejects the idea that marketability contributes positively to farmers' intention to adopt organic agriculture practices. These results offer nuanced insights into the intricate factors that influence farmers' decisions regarding the adoption of organic farming practices.

The proposed hypothesis (H7), asserting that 'food security concerns may positively influence farmers' attitudes toward the adoption of organic agricultural practices,' is substantiated in the present study. Compelling evidence supporting H7 is evident in the significant t-value of 4.120 and p-value of 0.00. Similarly, Hypothesis H8, positing that 'marketability may have a positive influence on farmers' attitudes regarding the adoption of organic agriculture practices,' is also validated. The significant t-value (4.673) and p-value (0.00) underscore the robust relationship between marketability and attitude.

Furthermore, the study's notable t-value (6.774) and p-value (0.00), along with the path coefficient (β=0.596) of marketability and subjective norms, affirm Hypothesis H9, indicating that 'marketability may positively influence subjective norms regarding the adoption of organic agriculture practices.'

These outcomes collectively signify that the Theory of Planned Behavior (TPB) exerts a significant effect on farmers' intention to adopt organic farming. Specifically, attitude, subjective norms, perceived behavioral control, and health consciousness exhibited positive and statistically significant influences on the intention to adopt organic agriculture practices. Consequently, it can be inferred that farmers' behavioral intention to adopt organic agriculture is contingent upon their attitudes, subjective norms, perceived behavioral control, and health consciousness. However, this study reveals that food security concerns and marketability exhibit non-significant relationships with intention. Additionally, food security concerns and marketability significantly impact the attitude of organic farmers, with marketability establishing a positive relationship with subjective norms.

4.4.3.4.2 Analysis of effect of mediators

Mediation occurs when a third variable, referred to as the mediator, intervenes between two correlated constructs (Hair *et.al.*, 2017). Specifically, a change in the exogenous construct leads to a change in the mediator variable, which, in turn, causes a change in the endogenous construct within the PLS path model. Consequently, the mediator variable influences the nature of the relationship between the two constructs. In the second phase of the analysis, all indirect effects were computed and their significance was determined through bootstrapping. Mediators were assessed in the second stage to examine indirect effects. To determine the relevance of the indirect path, 1000 rounds of bootstrapping rounds were conducted.

The indirect coefficient for the path Food Security Concerns → Attitude → Intention was 0.107. The associated t-value was 2.153, with a p-value of 0.009, providing supporting evidence for hypothesis (H10), suggesting that 'attitude may act as a mediator in the relationship between food security concerns and intention.'

For the path marketability → attitude → intention, the indirect coefficient (β=0.152) yielded a significant t-value of 2.609 and a p-value of 0.038, surpassing the required threshold. This underscores the significance of hypothesis (H110) that posits 'attitude may act as a mediator in the relationship between marketability and intention.'

The subsequent indirect path, marketability → Subjective Norms → intention, revealed a path coefficient of 0.182, along with a significant t-value of 3.536 and a p-value of 0.00. This robustly supports Hypothesis (H12) in the study, suggesting that 'subjective norms may act as a mediator in the relationship between marketability and intention.'

Importance-Performance Matrix Analysis (IPMA) is a valuable complement to standard Partial Least Squares Structural Equation Modeling (PLS-SEM) estimations, as it provides a graphical representation of the total effects of latent variables on a target variable in relation to their latent variable scores. This enabled the identification of critical areas for attention and action.

In IPMA, the total effects of the structural model on a specific target construct, such as intention, are compared with the average latent variable scores of its predecessors, including attitude, perceived behavioral control, subjective norms, health consciousness, food security concerns, and marketability. The total effects indicate the importance of predecessor constructs in shaping behavioral intention, whereas the average latent variable scores represent their performance. The objective is to identify predecessors with high importance but relatively low performance who then become potential targets for improvement.

Table 27. Types of mediating effects

Hypothesis	Corresponding path	Path Coefficient (β)	SD (STDEV)	T statistics	Confidence of Interval		P values	Result
					2.5%	97.5%		
H10	Food Security Concerns→ Attitude→Intention	0.107	0.049	2.153	0.024	0.213	0.032	Accepted
H11	Marketability→Attitude→Intention	0.152	0.058	2.609	0.038	0.268	0.009	Accepted
H12	Marketability→ Subjective Norms →Intention	0.182	0.051	3.536	0.088	0.284	0.000	Accepted

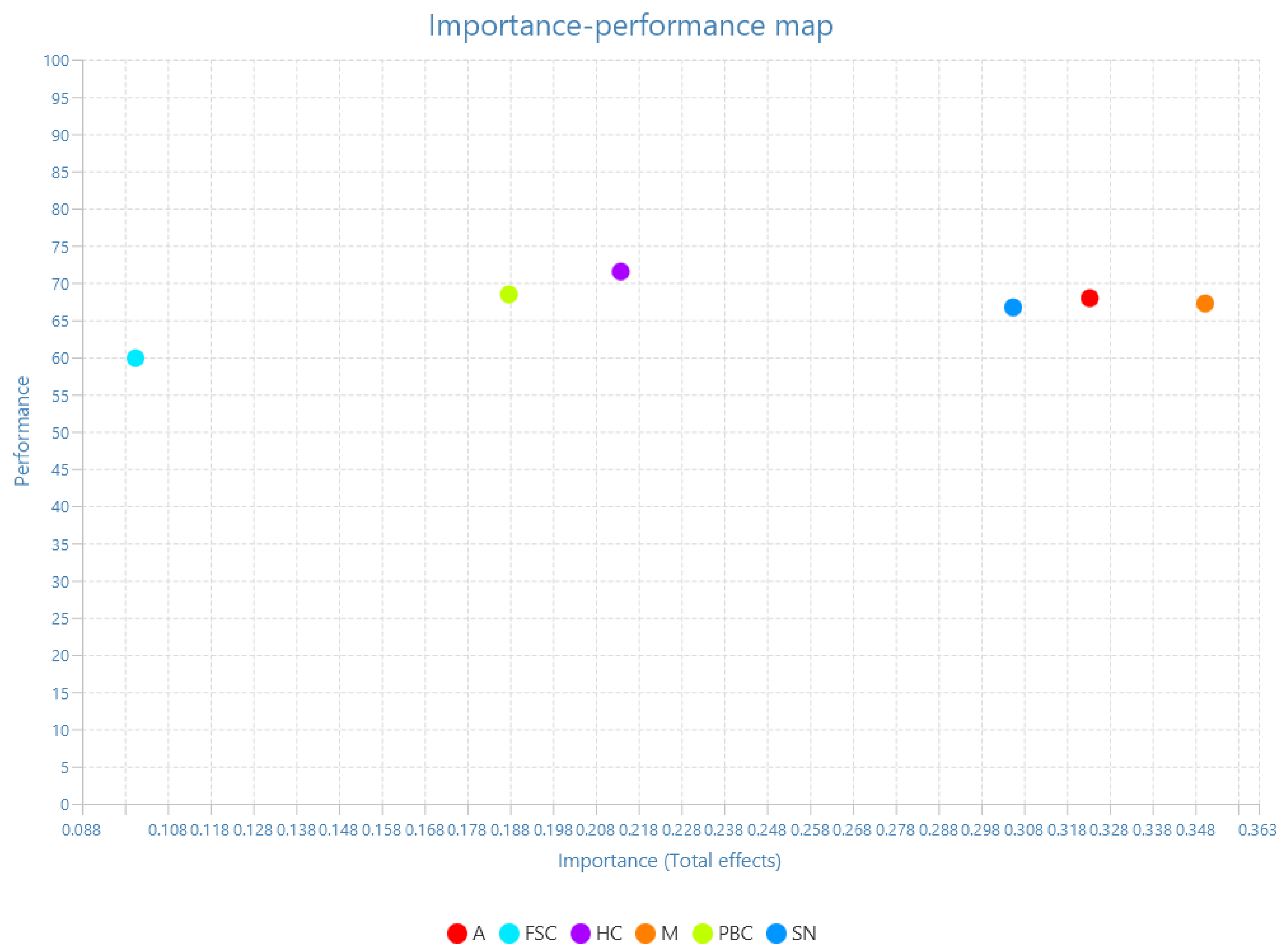


Figure 21. Importance performance map

The resulting IPMA data enable the creation of an Importance-Performance Map, as depicted in Figure 22. The X-axis represents the (unstandardized) total effects of attitude, perceived behavioral control, subjective norms, health consciousness, food security concerns, and marketability on the target construct (intention), while the y-axis represents the average rescaled (unstandardized) latent variable scores of attitudes, perceived behavioral control, subjective norms, health consciousness, food security concerns, and marketability.

Based on the analysis shown in Figure 22, attitude and marketability emerged as the two most crucial determinants in predicting farmers' behavioral intentions toward adopting organic farming. Additionally, subjective norms and health consciousness play pivotal roles in farmers' decisions to adopt organic farming practices. Conversely, perceived behavioral control and food security concerns were identified as the least important factors in this context. This nuanced understanding can guide interventions and strategies to enhance the adoption of organic farming practices by farmers.

4.5 Marketing channel

Marketing channels constitute conduits that facilitate the flow of products from producers to consumers, and their extent can exert a substantial impact on price differentialsamong organic farmers who have adopted an array of marketing channels to advertise and sell their organically grown produce, as shown in Table 28.

Table 28: Distribution of the farmers according to market intermediaries used to sell organic produce.

Sl. No.	Marketing channel (Intermediaries)	Frequency (N=150)	Percentage
1.	Directly to consumer	120	80.00
2.	Retailer	37	24.67
3.	Wholeseller	76	50.66
4.	Village trader	60	40.00
5.	Co-operatives	54	36.00

Table 28 provides a comprehensive overview of the diverse marketing channels adopted by organic farmers to sell their produce. Notably, 80.00 per cent of respondents used the direct selling approach to customers, establishing it as the most prevalent and effective marketing channel. This method is advantageous because it eliminates intermediaries, thereby minimizing price spreads and maximizing the producer's share of the consumer rupee.

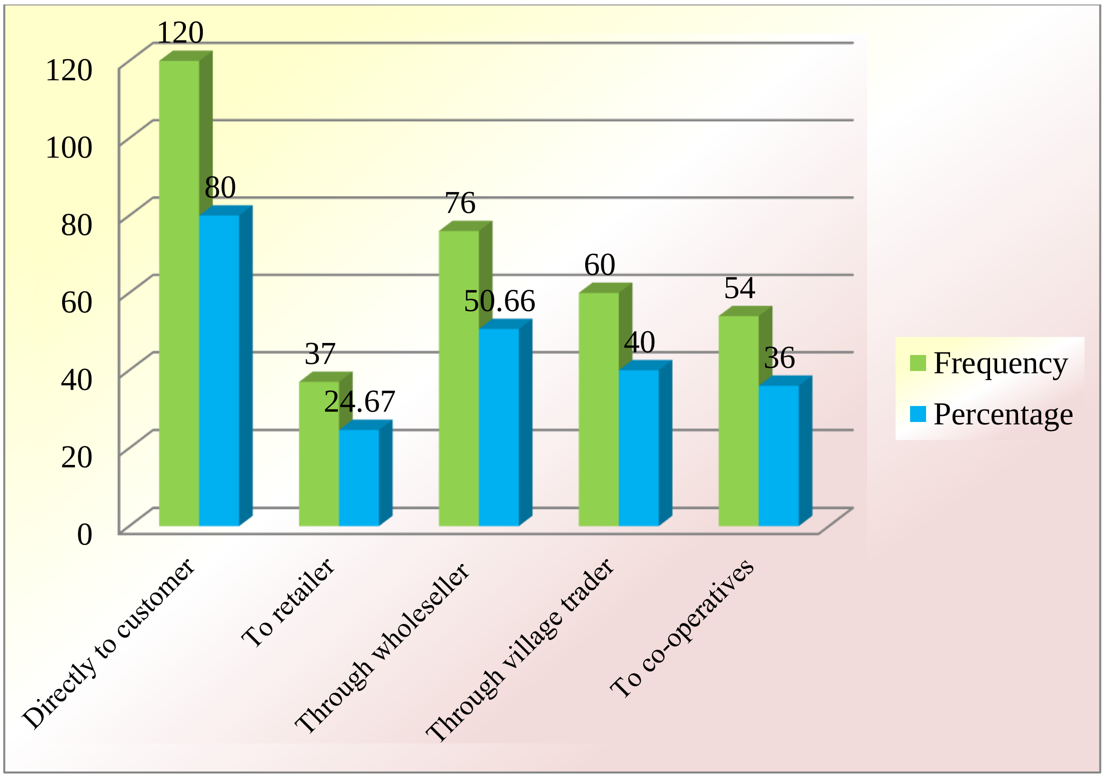


Figure 22: Distribution of the respondents according to the marketing channel used to sell organic produce

Approximately 50.67 per cent of the farmers chose wholesalers as their preferred channel. The rationale behind this choice is that pragmatic wholesalers visit farmers' fields to collect produce and make immediate payments during exchanges. This not only reduces the risk associated with transportation for farmers, but also allows them to concentrate on production aspects for subsequent crops.Furthermore, 40.00 per cent of the farmers opted for village traders, 36.00 per cent for cooperatives, and 24.67 per cent for retailers. The 36.00 per cent who engaged with cooperatives showcased a commendable collective approach to marketing organically grown produce. By pooling their resources, organic farmer associations attract the interest of various entities, including organic outlets and corporate companies. This group-based marketing strategy enhances farmers' bargaining power, while buyers benefit from conveniently obtaining high-quality produce, reducing overall transportation costs.Essentially, the data underscore the strategic decisions made by organic farmers in selecting their marketing channels, reflecting a nuanced understanding of the advantages and trade-offs associated with each approach.

The current study aligns with past research findings, indicating a prevalent preference among organic farmers for direct selling to consumers (80.00 per cent). This echoes patterns observed in previous studies, including those by Azam and Banumathi (2015), Raahinipriya and Jansi Rani (2018), Ruaykijakarn*et.al.*, (2018), Sivaraj *et.al.*, (2018), and Ahmed (2019). The collective evidence underscores the effectiveness of this approach in reducing intermediary interference, minimizing price spreads, and maximizing the producer's share in the consumer rupee.The data indicate a diverse range of marketing channel preferences among the organic farmers. Although a substantial portion opt for direct-to-consumer sales, other channels, including wholesalers, village traders, retailers, and cooperatives, also hold significant importance. The selection of a marketing channel appears to be influenced by risk management, convenience, and the quest for collective bargaining power.

4.6.1 Constraints face by farmers in adoption of organic farming

To enhance the adoption of organic farming practices among farmers, it is crucial to identify and address the various constraints they face in this regard. In order to gain insights into these challenges, respondents were surveyed and asked to articulate the obstacles they encounter in adopting organic cultivation practices. The frequency and percentage of each constraint were systematically calculated. This information serves as a foundation for implementing targeted corrective measures to overcome these hindrances and promote the widespread adoption of organic farming.The data in this regard are presented inTable 29.

Table 29: Constraints faced by the respondents in adoption of organic agricultural practices.

Sl.No	Constraints	Frequency	Percentage
1.	Certification cost is higher	141	94.00
2.	Lack of technical advisory services related to organic farming	77	51.33
3.	Reduced yield during transition period	133	88.66
4.	Inadequate availability of organic inputs	68	45.33
5.	No exclusive market	106	70.66

Table 29 delineates various constraints encountered in organic cultivation, presenting the frequency and percentage of each challenge. A predominant limitation highlighted is the high cost of certification, acknowledged by 94.00 per cent of respondents, constituting a significant hurdle to the widespread adoption of organic farming. Another prevalent issue is the reduced yield during the conversion period, impacting 88.66per cent of surveyed individuals, indicating a transitional challenge in the adoption of organic farming practices. Additionally, the absence of technical advisory services related to organic farming emerges as a noteworthy constraint, affecting 51.33 per cent of respondents, potentially hindering guidance, and support for farmers in this domain. The inadequate availability of organic inputs is identified by 45.33 per cent of participants, underscoring challenges in accessing essential resources for organic farming practices. Moreover, the absence of an exclusive market for organic produce is a notable constraint, affecting 70.66 per cent of those surveyed, potentially influencing sales and distribution channels.

These findings underscore critical areas of concern within organic cultivation, particularly concerning certification costs, yield fluctuations, access to guidance, input availability, and market accessibility. The identified constraints emphasize the necessity for targeted interventions to address these challenges and create a more supportive environment for organic farming initiatives.

4.6.2 Suggestions offered by the organic farmers

Table 30 outlines suggestions provided by organic farmers aimed at enhancing the landscape of organic cultivation, displaying the frequency and percentage of each proposal. The respondents, drawing on their experiences and insights, have offered valuable recommendations to improve the status of organic farming. These suggestions serve as constructive insights for stakeholders and policymakers seeking to support and promote organic cultivation. The table provides a comprehensive view of the priorities and ideas expressed by organic farmers, indicating potential areas for intervention and enhancement within the organic farming sector.

Table 30: Suggestions offered by the organic farmers

Sl.No	Suggestion	Frequency	Percentage
1.	Assured Minimum Premium Price for organic products	118	78.66
2.	Exclusive market for organic produce	121	80.66
3.	Reducing the certification and renewal cost	109	72.66
4.	Special assistance from government during conversion period	67	44.66
5.	Assured supply of organic inputs at subsidized rates	57	38.00

The most prevalent recommendation, articulated by 78.66 per cent of participants, emphasizes the implementation of a minimum premium price for organic products. This widespread endorsement suggests a collective desire among organic farmers for fair compensation within the organic market. Additionally, significant support is expressed for the establishment of an exclusive market for organic produce, with 80.66 per cent of respondents advocating for this approach. This underscores a perceived need for a dedicated platform to facilitate the sale and distribution of organic goods.

Reducing certification and renewal costs emerges as another prominent suggestion, with 72.66 per cent of participants endorsing this proposal. This indicates a strong call for measures to enhance the affordability and accessibility of the certification process, thereby facilitating broader participation in organic farming. Furthermore, the notion of governmental support during the conversion period is highlighted by 44.66 per cent of respondents, signaling a desire for targeted assistance to navigate challenges during the transition to organic farming practices.

Lastly, ensuring a steady supply of organic inputs at subsidized rates is suggested by 38.00 per cent of those surveyed. This underscores the importance of both affordability and availability of essential resources for organic farming, recognizing the role of accessible inputs in promoting sustainable agricultural practices.

These suggestions collectively underscore the aspirations of stakeholders within the organic cultivation sector, emphasizing the significance of fair pricing, market accessibility, cost reduction, governmental assistance, and resource availability to foster a more conducive environment for organic farming practices.

SUMMARY AND CONCLUSIONS

CHAPTER V

SUMMARY AND CONCLUSIONS

The Green Revolution in India has undeniably transformed the country from a food deficit to a food surplus economy, but it has come at the cost of environmental degradation due to its oversight of ecological principles. In response to this, there is growing emphasis on identifying ecologically sound and sustainable farming systems that are adaptable to diverse soils and agro-climatic conditions. Among these alternatives, organic farming has gained traction and is becoming an increasingly viable option for farmers. The Government of India and various state governments have initiated numerous programs to promote organic farming, recognizing the need for a more sustainable agricultural approach.

However, the success of these initiatives hinges on understanding and addressing farmers' adoption of organic farming. Without a fundamental understanding of these factors, the planning, distribution, and execution of organic farming promotions may be hindered. To bridge this gap, the theory of planned behavior (TPB) was employed to scrutinize the motivations behind farmers' decisions to adopt organic farming. The TPB, historically applied across scientific fields to characterize purpose-related human behavior, provides a structured framework for understanding the psychological factors influencing adoption decisions. This study specifically focuses on investigating the determinants of farmers' intention to adopt organic farming in the Konkan region. The Konkan region, with its unique agroclimatic conditions, presents a context-specific scenario that can offer insights applicable to similar regions. By identifying the variables that influence farmers' intentions, this study aims to provide valuable information for extension services, policymakers, and agricultural planners. This understanding can then be utilized to develop a comprehensive framework for promoting organic farming tailored to the needs and concerns of farmers in the Konkan region.

Despite the crucial role of farmers' adoption behavior in shaping sustainable farming practices, these challenges have often received insufficient attention in India. Recognizing this gap, the expanded theory of planned behavior is adopted as the foundation for understanding farmers' intentions to adopt organic farming in the Konkan region. This framework incorporates factors such as perceived behavioral control, subjective norms, and attitudes, providing a more comprehensive understanding of the decision-making process. The findings of this study are expected to contribute to the development of effective and targeted strategies for promoting organic farming, thereby fostering a more sustainable and environmentally friendly agricultural landscape in the Konkan region and beyond.

5.1 Objectives

5. To study socio-economic, institutional and agro ecological characteristics of the organic farmers,
6. To study the adoption of prevailing organic agricultural practices in rice-based cropping systems,
7. To explore the determinants of farmers intention towards adoption of organic agricultural practices in rice-based cropping system,
8. To study the marketing channels utilized by the farmers while selling their organic farm produce.

The present study aimed to investigate the adoption behavior and intentions of organic farmers in the Konkan region, specifically focusing on two districts representing different agroclimatic zones: Ratnagiri in the south Konkan zone and Raigad in the north Konkan zone. For a comprehensive understanding, 30 groups of organic farmers were identified in each district based on their cropping systems. Subsequently, five members were randomly selected from each group, resulting in a total sample size of 150 organic farmers, with 75 farmers in each district.The data collection method employed in this study involved personal interviews with the selected respondents. This approach allows for in-depth exploration of farmers' attitudes, motivations, and challenges related to organic farming. Following data collection, both descriptive statistics and the Partial Least Squares Structural Equation Modeling (PSL-SEM) model were applied to analyze the gathered data. The combination of these methods enables a thorough examination of the factors influencing farmers' intentions to adopt organic farming, and provides insights into the relationships among these variables.

5.2 Socio-economic, institutional and agroecologicalcharacteristics of the organic farmers

- The findings of this study suggest that the largest proportion (54.00 per cent) of organic farmers belonged to the middle-aged group. This suggests that individuals within this age bracket are motivated by the desire for a healthier lifestyle and respond to the increasing demand for organic produce. The adoption of organic farming in this age group could be attributed to the convergence of personal health consciousness and market-driven factors.
- Additionally, the majority of respondents (36.67 per cent) had an education level up to the secondary level, indicating that a significant proportion of organic farmers possess basic

educational qualifications. This could enhance their understanding and acceptance of sustainable agricultural techniques, potentially contributing to improved communication and effectiveness of extension services.

- Most organic farmers cultivate a marginal area of 1.38 hectares, which is attributed to the progressive subdivision of ancestral lands, resulting in smaller individual landholdings. This trend underscores the need for strategies to optimize productivity on limited land.
- Moreover, the average farming income of organic farmers was Rs. 72,017/-. The majority of respondents fell into the medium category of farming income, indicating a strategic approach to maximize earnings from available land. This underscores the economic viability of organic farming as a sustainable agricultural practise.
- It is evident from the data that a sizable proportion (72.00 per cent) of organic farmers possess a moderate level of expertise in organic farming. This suggests a thriving and progressive organic farming community, with a substantial number of farmers attaining a reasonable yet manageable level of expertise.
- A substantial portion (63.33 per cent) of organic farmers had a 'medium' level of connection with extension organizations, indicating a well-balanced and expansive dissemination of information and support. The high level (92.67 per cent) of access to the Agriculture Technology Management Agency (ATMA) and Krishi Vigyan Kendra indicates efficient utilization of these resources.
- A significant number (64.00 per cent) of the respondents reported availing crop loans from national and cooperative banks, suggesting accessibility and reliance on institutional credit. However, the limited adoption (35.33 per cent) of Pradhan Mantri Fasal Bima Yojana (crop insurance) may be attributed to factors such as inadequate awareness and delays in claim settlement.
- The study indicates that the majority of respondents (42.00 per cent) fell within the medium category of social media accessibility. This indicates a balanced exposure to digital information and communication channels, highlighting the prevalence of WhatsApp as a prominent social media platform among organic farmers. This suggests its potential as an effective platform for information dissemination and knowledge sharing within a community. The use of YouTube and Facebook further emphasizes the importance of multimedia platforms for reaching and engaging with this demographic. However, the infrequent use of Instagram, LinkedIn, and Twitter suggests a more selective usage of social media platforms within this farming community.

- It is observed that the majority of organic farms, comprising 68.67 per cent, fall within the 'middle' age category. Furthermore, 18.66 per cent are categorized as 'new organic farms', while 12.67 per cent are 'old organic farms'.
- The preference for 'lowland' terrains is evident, with 49.33 per cent of respondents expressing a preference for such areas, which offer favorable conditions for organic farming practices, including better water availability and nutrient retention. Additionally, most farmers (60.00 per cent) practiced organic cultivation on lateritic soil, which is known for its fertility and drainage advantages.
- A significant proportion of respondents, amounting to 52.00 per cent, exhibit a 'medium' level of on-site organic input production. The presence of medium-sized livestock inventories, comprising 52.00 per cent of the respondents, suggests a balanced approach, likely due to constraints on available resources, emphasizing the importance of livestock in organic farming practices. Manure, constituting 86 per cent of on-site production, includes farmyard manure (FYM), poultry litter, fish meal, and vermicompost. The study also highlights the production frequencies of key on-site inputs, such as Beejamrut, Jeevamrut, Panchgavya, and Bio-pesticides.

5.3. Adoption of organic agricultural practices in rice-based cropping systems

A study has found that a significant proportion of farmers, approximately 41.34%, fall within the 'medium' adoption category. The study's results indicate that manuring practices have been universally adopted across all cropping systems, underscoring their critical role in enriching the soil and promoting crop nutrition in organic farming. Furthermore, a substantial majority of farmers have also embraced the use of biopesticides, indicating a shift towards sustainable practices for pest management. Additionally, crop rotation practices have been adopted by 60.00% of farmers, particularly in the rice-oilseed system, demonstrating a recognized strategy for breaking pest cycles and enhancing soil health. Overall, these results suggest a commitment to essential organic farming practices, balancing universally acknowledged methods with context-specific preferences tailored to diverse cropping systems.

5.4Theory of planned behaviour (TPB): Analysing Behavioural Constructs

- The findings of this study indicate that the majority of organic farmers exhibit a medium-to-high level of intention to adopt organic farming practices. Their attitude towards the adoption of organic farming is characterized as neutral to favourable. Moreover, these farmers have a high level of health consciousness. Subjective norms significantly influence the decision-making processes.

- In terms of perceived behavioral control, the majority of organic farmers reported a medium level of control over adopting organic farming practices. They also expressed "medium" levels of concern for food security when transitioning to organic farming. However, they perceived marketability to be a medium to low determinant of their intention to adopt organic farming practices.

5.5 Partial Least Square- Structural equation modelling

- The present study found that the proposed extended theory of planned behavior is supported by the results obtained using PLS-SEM. The measurement model exhibited appropriate factor loadings for the latent variables under the selected constructs of TPB and also showed sufficient reliability and validity, as well as a good fit to the data. The model also demonstrated predictive power, with R2 values of 81.4 per cent for intention, 52.8 per cent for attitude, and 35.5 per cent for subjective norms.
- The structural inner model of PLS-SEM revealed that the TPB had a significant impact on farmers' intention to adopt organic farming. Specifically, attitude, subjective norms, perceived behavioral control, and health consciousness were found to have a positive and significant influence on the intention to adopt organic farming and were identified as determinants of the extended theory of planned behavior. Therefore, it can be inferred that farmers' behavioral intention to adopt organic farming is influenced by their attitude, subjective norms, perceived behavioral control, and health consciousness. However, food security concerns and marketability showed no significant relationship with intention.
- Moreover, the study found that food security concerns and marketability had a significant impact on the attitudes of organic farmers, and marketability established a positive relationship with subjective norms. Additionally, mediation analysis revealed that attitude mediates the relationship between food security concerns and intention and between marketability and intention. Furthermore, subjective norms mediate the relationship between marketability and intentions.
- The IPMA analysis of PLS-SEM showed that attitude and marketability were the most important determinants in predicting the behavioral intention of farmers to adopt organic farming. Subjective norms and health consciousness were also found to be crucial in determining farmers’ intention to use pesticides. In contrast, perceived behavioral control and food security concerns were found to be the least important factors.

5.6Marketing channels utilized by farmers

- This study undertakes a comprehensive examination of the diverse marketing channels used by organic farmers to sell their products. Notably, a substantial proportion (80.00 per cent) of the respondents preferred the direct selling approach to customers, rendering it the most widely adopted and efficacious marketing channel. Nearly half (50.67 per cent) of the farmers opted for wholesalers as their preferred marketing avenue motivated by practical considerations. Wholesalers often visit farmers' fields to collect produce and make immediate payments during exchanges, thereby mitigating transportation-related risks for farmers and allowing them to concentrate on production aspects for subsequent crops. Additionally, 40.00 per cent of the farmers selected village traders, 36.00 per cent chose cooperatives, and 24.67 per cent opted for retailers as their marketing channels. The 36.00 per cent engagement with cooperatives signifies a commendable collective approach to marketing organically grown products.

IMPLICATIONS

CHAPTER VI

IMPLICATIONS

The study entitled ‘Determining Farmers' Intentions to Adopt Organic Agricultural Practices using Structural Equation Modeling (SEM)' aimed to identify the factors influencing farmers' intentions towards pesticide application. The investigation has yielded significant findings. Drawing from the key results and conclusions, the following implications are highlighted to provide insights for policymakers, technocrats, extension professionals, administrators, and research scholars.

1 The most significant implication of this study pertains to the substantial representation of middle-aged organic farmers, comprising 54.00 per cent of the respondents. Considering the convergence of personal health awareness and market-driven factors in this age group, it is essential to design targeted educational campaigns that highlight the health benefits associated with organic farming. Policymakers should develop appropriate policies to assist middle-aged farmers by providing financial incentives and implementing capacity building programmes. Community engagement and productivity can be enhanced by promoting collaborative initiatives and integrating technology into farming practices. These findings emphasize the importance of ongoing research to adapt support mechanisms to the evolving needs of this demographic, ultimately fostering a flourishing and sustainable organic-farming community in the region.

2 The finding that a substantial portion of respondents (36.67 per cent) in the study have completed their education up to the secondary level has considerable implications for the organic farming sector. This fundamental educational background of organic farmers indicates a possible receptiveness to sustainable agricultural techniques. Farmers with a basic education are more likely to comprehend and adopt eco-friendly practices, thereby facilitating more effective communication and extension services. This finding emphasizes the significance of designing educational programs to cater to diverse audiences and presents an opportunity for policymakers and extension services to capitalize on this educational foundation for specific interventions. By doing so, the organic farming community can enhance its practices, promote sustainability, and facilitate informed decision making for both farmers and the environment.

3 The widespread cultivation of a marginal area of 1.38 hectares among organic farmers, as a result of the subdivision of ancestral lands, underscores the pressing need for strategies aimed at optimizing productivity on limited land. Given smaller individual landholdings,

there is a critical implication for introducing sustainable and high-yield organic farming practices. It is imperative that policymakers focus on providing institutional support, including access to advanced technologies,credit,and market facilities, to empower farmers to overcome the challenges associated with limited land size. Addressing this imperative is vital for enhancing the economic viability of organic farming and ensuring the long-term sustainability of agricultural practices in light of the diminishing land resources.

4 The finding that organic farmers earn Rs. 72, 017/- per year on average, with the majority falling within the medium-income category, has significant implications for the economic feasibility of organic farming. The fact that many farmers strategically maximize their earnings from available land underscores the potential of organic farming to serve as a sustainable form of agriculture. This finding indicates that organic farming not only contributes to environmental sustainability but also provides a financially viable option for farmers by fostering a balance between economic success and ecological responsibility. Policymakers and stakeholders in the agricultural sector can draw on these findings to further promote and support organic farming as a means of achieving both economic and environmental sustainability.

5 A significant proportion (72.00 per cent) of organic farmers demonstrated a moderate level of expertise in organic farming, signifying a thriving and progressive community within the organic farming sector. This moderate expertise level suggests harmony between accumulated knowledge and continuous learning, indicating a dynamic policy environment in which farmers are persistently adapting to new techniques and innovations. The implication is that the organic farming community is well equipped to promote sustainable agricultural practices, as farmers with a moderate level of expertise are likely to be receptive to advancements in organic farming methods. This adaptability is essential for the community's resilience and capacity to navigate the evolving landscape of organic agriculture, contributing to the long-term success and viability of organic farming practices.

6 The fact that 63.33 per cent of organic farmers with a 'medium' level of connection to extension organizations reflects a well-balanced and extensive distribution of information and assistance, indicating that extension services have successfully reached a considerable segment of the organic farming community. This facilitates the exchange of knowledge and the provision of technology support. Furthermore, high access (92.67 per cent) to critical resources such as the Agriculture Technology Management Agency (ATMA) and Krishi Vigyan Kendra (KVK) underscores the efficient utilization of these resources, emphasizing the importance of continued collaboration with such agricultural institutions for the development and sustainability of organic farming practices.

7 The significant reliance (64.00 per cent) on crop loans from national and cooperative banks reflects the accessibility of institutional credit, which provides crucial financial support to organic farmers. On the other hand, the limited adoption (35.33 per cent) of PradhanMantriFasalBimaYojana (PMFBY) signals a need for increased awareness and streamlined processes to enhance farmers' trust and participation in crop insurance, ensuring a more comprehensive risk management framework for agricultural sustainability.

8 The study revealed that 42.00 per cent of the respondents fell within the medium category of social media accessibility, highlighting the balanced exposure of organic farmers to digital media. The prevalence of WhatsApp as a prominent social media platform suggests its potential as an effective tool for community-based information dissemination and knowledge-sharing. While YouTube and Facebook play significant roles, the rare use of Instagram, LinkedIn, and Twitter (X) indicates a more selective adoption of social media platforms within the farming community, emphasizing the need for targeted and platform-specific communication strategies.

9 The predominant categorization of organic farms in the 'middle' age category (68.67 per cent) highlights the need for targeted support and incentives to sustain the momentum of established organic farming practices. The significant preference for 'lowland' terrains (49.33 per cent) suggests that policies promoting organic farming in such areas could harness the inherent advantages of better water management and nutrient retention, thereby fostering a conducive environment for sustainable agriculture. Moreover, the prevalent use of lateritic soil (60.00 per cent) emphasizes the importance of preserving and enhancing soil fertility, thereby emphasizing the potential benefits of organic farming on soils with natural drainage advantages.

10 The notable presence of a 'medium' level of on-site organic input production among 52.00 per cent of respondents underlines a sensible approach in organic farming practices, possibly driven by resource constraints. This emphasizes the critical role of livestock, with 52.00 per cent maintaining medium-sized inventories to sustain on-site organic input production. The dominance of manure, comprising 86 per cent, including FYM, poultry litter, fish meal, and vermicompost, signifies reliance on organic, farm-generated inputs, contributing to soil health and overall sustainability.

11 The finding that 41.34 per cent of farmers fall within the 'medium' adoption category suggests a considerable adoption of organic farming practices. The adoption of manuring practices and widespread use of biopesticides across all cropping systems accentuates a collective commitment to sustainable and eco-friendly methods. The significant uptake of crop rotation, particularly in the rice-oilseed system and rice-vegetables, signals the

recognition of context-specific strategies for pest control and soil health enhancement, reinforcing the agricultural sector's dedication to holistic organic farming practices.

12 The findings of this study suggest that organic farmers generally hold a positive attitude and notable level of health consciousness towards adopting organic farming practices. The influence of subjective norms on decision making emphasizes the importance of social factors in shaping adoption intentions. However, the perceived medium level of control over adoption and various concerns regarding food security and marketability underline the need for extension interventions and support mechanisms to address specific challenges and uncertainties in the transition to organic farming.

13 The robust support for the extended Theory of Planned Behavior (TPB) in the present study, validated through Partial Least Squares Structural Equation Modeling (PLS-SEM), has significant implications at the national, regional, and global scale. Understanding the determinants of farmers' intention to adopt organic farming, particularly the positive influences of attitude, subjective norms, perceived behavioral control, and health consciousness, provides a foundation for demand-driven agricultural policies and extension programs. Regionally, recognizing the impact of food security concerns and marketability on farmers' attitudes underscores the need for regional strategies that address these factors to promote and sustain organic farming. Globally, acknowledging the mediating roles of attitude and subjective norms in the relationships between food security concerns, marketability, and intention contributes to a more nuanced understanding of cross-cultural variations in organic farming adoption. The importance performance matrix analysis (IPMA) further emphasizes the importance of attitude and marketability in predicting farmers' behavioral intentions, guiding the development of global initiatives that prioritize these determinants for successful organic farming adoption.

14 One implication of this study's findings on the diverse marketing channels used by organic farmers is the significance of recognizing and supporting the predominant preference for direct selling. A substantial proportion (80.00 per cent) of respondents favouring direct selling indicated a strong inclination to establish direct connections with consumers. Policymakers, agricultural extension services, and market facilitators should consider initiatives that empower and enhance farmers' capacity to engage in direct selling. This may involve providing training on marketing strategies, promoting producers' organizations, creating platforms for farmers to connect directly with consumers, and facilitating logistical support to streamline the direct-selling process. Acknowledging and fostering this preference can contribute to the sustainability of organic farming by strengthening farmers' control over

their product marketing, fostering consumer trust, and promoting a more resilient and equitable agricultural ecosystem.

15 Future research in the domain of organic farming adoption could explore longitudinal studies to track the temporal evolution of farmers' attitudes and intentions, thus providing insights into the dynamic nature of adoption behavior. Cross-cultural comparisons across diverse regions may shed light on the contextual factors influencing organic farming decisions, while an in-depth analysis of the non-significant relationships identified in this study, such as those related to food security concerns and marketability, could deepen our understanding of potential barriers. Additionally, research can focus on testing and validating specific strategies, integrating technological innovations, and assessing the impact of existing policies on organic farming adoption. Exploring the role of organic farming in climate change resilience and conducting social network analyses to understand community dynamics could provide valuable insights into adoption behavior. Ultimately, future research endeavors have the potential to refine strategies, inform policies, and contribute to the sustainable transformation of agri-food system.

LITERATURE CITED

CHAPTE VII

LITERATURE CITED

Abdulai, S., Zakariah, A.andDonkoh, S. A. (2018). Adoption of rice cultivation technologies and its effect on technical efficiency in Sagnarigu District of Ghana. *Cogent Food and Agriculture*, *4*(1): 1424296.

Adesope, O. M., Matthews-Njoku, E. C., Oguzor, N. S. andUgwuja, V. C. (2012).Effect of on their adoption of organic farming practices. *Crop production technologies*: 210-220.

Ahmed, T. (2019). Sustainability and Adoption of Organic Farming Practices in Southern Karnataka. Ph.D. (Agri) Thesis, University of Agricultural Sciences, Bengaluru.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. *In Action control .Springer*: 11-39.

Ajzen, I. (1991). The theory of planned behaviour.*Organizational behaviour and human decision processes*, 50 (2): 179-211.

Ajzen, I. (2015). Consumer attitudes and behavior: the theory of planned behavior applied to food consumption decisions. *Italian Review of Agricultural Economics*, *70*(2): 121-138.

Ajzen, Icek and Fishbein, M..(1980). Understanding Attitudes and Predicting Social Behavior.*Journal of Experimental Social Psychology:* 278.

AkkamahadeviNaik, (2015). Knowledge and adoption of organic farming practices in red gram in dryland areas of Karnataka, *M.Sc. (Ag.) Thesis.*College of agriculture Rajendranagr, Hyderabad, India.

Alexopoulos, G., Koutsouris, A., andTzouramani, I. (2010). Should I stay or should I go? Factors affecting farmers’ decision to convert to organic farming as well as to abandon it.In *9th European IFSA Symposium, Vienna (Austria)* (pp. 1083-1093).

Alzaidi, A. A., Baig, M. B., andElhag, E. A. (2013).An investigation into the farmers’ attitudes towards organic farming in Riyadh Region–Kingdom of Saudi Arabia. *Bulgarian journal of agricultural science*, *19*(3), 426-431.

Ambali, O. I., Areal, F. J. and Georgantzis, N. (2021). Improved rice technology adoption: The role of spatially-dependent risk preference. *Agriculture*, *11*(8): 691.

Ankrah, D. A., Kwapong, N. A., Eghan, D., Adarkwah, F.andBoateng-Gyambiby, D. (2021). Agricultural insurance access and acceptability: examining the case of smallholder farmers in Ghana. *Agriculture and Food Security*, *10*(1): 1-14.

Asadollahpour, A.; Najafabadi, M.O.; Hosseini, S.J. Modeling behavior pattern of Iranian organic paddy farmers. *Paddy Water Environ.* 2016, *14*, 221–229.

Ashari, J.S., Mohammed Zainal, A., Terano, R., 2016. Rice farmers' perception and attitude toward organic farming adoption. Agro Economic Journal 34, 35–46.

Ashari, N., Sharifuddin, J., Mohammed, Z. A., and Terano, R. (2018).Paddy farmer's perception and factors influencing attitude and intention on adoption of organic rice farming. *International Food Research Journal.*, *25*(Suppl. 2), S135–S145.

Azam, M. S., and Banumathi, M. J. I. J. (2015). The role of demographic factors in adopting organic farming: A logistic model approach. *Int. J. Adv. Res*, *3*, 713-720.

Azam, M. S., and Shaheen, M. (2019). Decisional factors driving farmers to adopt organic farming in India: a cross-sectional study. *International Journal of Social Economics*, *46*(4), 562-580.

Bakar, T. A., Shukri, N. A. S. M., Liew, J. Y., Zakaria, S., Mahshar, M., andRosli, F. (2021, May). Factors impinging fruit farmers adoption of organic farming practices in Johor, Malaysia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 756, No. 1, p. 012045).

Balla, J. and Goswami, K. (2022).Understanding the constraints and reasons to adopt natural farming-a study on rice growing farmers of Andhra Pradesh, India. *International Journal of Agricultural Sustainability*: 1-16.

Bhatiya Rajesh (2015). Farmers knowledge and organic paddy farming practices in Haryana.Ph.D.*(Ag.) Thesis*, CCS Haryana Agricultural University, Hisar.

Borges, J. A. R., Tauer, L. W., and Lansink, A. G. O. (2016).Using the theory of planned behavior to identify key beliefs underlying Brazilian cattle farmers' intention to use improved natural grassland: A MIMIC modelling approach. *Land Use Policy*. *55*: 193-203.

Bui, H. T. M., and Nguyen, H. T. T. (2021).Factors influencing farmers' decision to convert to organic tea cultivation in the mountainous areas of northern Vietnam. *Organic Agriculture*, *11*, 51-61.

Buyinza, J., Nuberg, I. K., Muthuri, C. W., and Denton, M. D. (2020). Psychological factors influencing farmers' intention to adopt agroforestry: a structural equation modeling approach. *Journal of Sustainable Forestry*, *39*(8), 854-865.

Cavite, H. J., Kerdsriserm, C., Llones, C., Direksri, N., and Suwanmaneepong, S. (2023). Farmers' perception of consumer information and adoption intention towards organic rice farming: Evidence from community enterprise in rural Thailand. *Outlook on Agriculture*, *52*(1), 79-88.

Chand, P. B., Joshi, K., Thapa, R., Lamsal, A.andChauhan, B. (2022). Factors Affecting the Adoption of Organic Farming in Farwestern Hill, Darchula District of Nepal. Tropical Agroecosystems, 3(1): 16-22.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, *295*(2), 295-336.

Codex Alimentarius Commission. (2007). Organically produced foods, World Health Organization (WHO)/Food and Agriculture Organization (FAO) of the United Nations, Rome, 3: 51.

Çukur, T., Kızılaslan, N., and Kızılaslan, H. (2019). Analysis of the factors affecting the adoption of organic farming in Turkey: The case of Samsun Province.

Dang, H. L., Li, E., Nuberg, I., and Bruwer, J. (2014). Understanding farmers' adaptation intention to climate change: A structural equation modeling study in the Mekong Delta, Vietnam. Environmental Science and Policy, 41, 11e22.

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, Massachusetts Institute of Technology).

Deng, J., Sun, P., Zhao, F., Han, X., Yang, G., and Feng, Y. (2016). Analysis of the ecological conservation behavior of farmers in payment for ecosystem service programs in eco-environmentally fragile areas using social psychology models. *Science of the Total Environment*. *550*: 382-390.

Dey, K., and Maitra, D. (2017). Agriculture Insurance in India: Promise, Pitfalls, and the way forward. *Economic and Political Weekly*, 88-96.

Diamantopoulos, A., and Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of marketing research*, *38*(2), 269-277.

Djokoto, J. G., Owusu, V., and Awunyo-Vitor, D. (2016). Adoption of organic agriculture: Evidence from cocoa farming in Ghana. *Cogent Food and Agriculture*, *2*(1), 1242181.

Doanh, N. K., Quynh, N. N., and Pham, T. T. L. (2022). Going organic or staying traditionalistic? The role of agriculture information system. *International Journal of Social Economics*, *49*(10), 1458-1478.

Edwards, A. L. (1946). A critique of “neutral” items in attitude scales constructed by the method of equal appearing intervals.*Psychological Review*, 53: 159–169.

Falola, A., andMukaila, R. (2022). Organic maize farming practices in Nigeria: Drivers and barriers. *Mediterranean Agricultural Sciences*, *35*(3), 147-154.

FiBL and IFOAM, (2022).The world of organic agriculture statistics and emerging trends.Research Institute of Organic Agriculture, FiBL and IFOAM Organics International.Retrieved from.https://shop.fibl.org.

Fielding, K. S., Terry, D. J., Masser, B. M., and Hogg, M. A. (2008).Integrating social identity theory and the theory of planned behaviour to explain decisions to engage in sustainable agricultural practices. *British journal of social psychology*, *47*(1): 23-48.

Ghosh, M. K., Sohel, M. H., Ara, N., Zahara, F. T., Nur, S. B., and Hasan, M. M. (2019).Farmers attitude towards organic farming: a case study in Chapainawabganj District. *Asian Journal of Advances in Agricultural Research*, *10*(2), 1-7.

Hair Jr, J., Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., andSarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

Hair, J. F., Anderson, R. E., Babin, B. J., and Black, W. C. (2010). Multivariate data analysis: A global perspective (7).

Hair, J. F., Hult, G. T. M., Ringle, C. M., and Sarstedt, M. (2016). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). 2nd edition. Thousand Oaks, CA: Sage.

Hall, K., and Rhoades, E. (2010). Influence of subjective norms and communication preferences on grain farmers' attitudes toward organic and non-organic farming. *Journal of Applied Communications*, *94*(3-4):51-65.

Hattam, C. (2006). *Adopting organic agriculture: An investigation using the Theory of Planned Behaviour* (1004-2016-78538).

Hattam, C. E., and Holloway, G. J. (2005). Adoption of certified organic production: Evidence from Mexico. Retrieved from.http://orgprints.org/4367/

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015).A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43(1)*, 115-135.

Imani, B., Allahyari, M. S., Bondori, A., Emami, N. and El Bilali, H. (2021). Adoption of organic potato production in Ardabil Plain, Iran: an application of the extended theory of planned behaviour. *Potato Research*, *64*(2): 177-195.

Issa, I. and Hamm, U. (2017).Adoption of organic farming as an opportunity for Syrian farmers of fresh fruit and vegetables: An application of the theory of planned behaviour and structural equation modelling. *Sustainability*, *9*(11): 2024.

Jagtap, A.B (2022). Modelling Farmers Intention Regarding Pesticides Application in Mango: An Empirical Analysis With Extended Theory Of Planned Behaviour (TPB). *M.Sc. (Agri.) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharashtra.

Jones, P. J., Sok, J., Tranter, R. B., Blanco-Penedo, I., Fall, N., Fourichon, C., ...andSundrum, A. (2016). Assessing, and understanding, European organic dairy farmers' intentions to improve herd health. *Preventive Veterinary Medicine*, *133*: 84-96.

Kadam P. (2016) Attitude of the farmers towards integrated pest management technology programme in Parbhani district. *M.Sc. (Agri) Thesis*, MAU.Parbhani.

Kafle, B. (2011). Factors affecting adoption of organic vegetable farming in Chitwan District, Nepal. *World Journal of Agricultural Sciences*, *7*(5), 604-606.

Karki, L., Schleenbecker, R., and Hamm, U. (2011).Factors influencing a conversion to organic farming in Nepalese tea farms. *Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS)*, *112*(2), 113-123.

Läpple, D., and Kelley, H. (2013). Understanding the uptake of organic farming: Accounting for heterogeneities among Irish farmers. *Ecological Economics*, *88*: 11-19.

Le Dang, H., Li, E., Nuberg, I., and Bruwer, J. (2014). Understanding farmers' adaptation intention to climate change: A structural equation modelling study in the Mekong Delta, Vietnam. *Environmental Science and Policy*, *41*: 11-22.

Li, J., Feng, S., Luo, T., and Guan, Z. (2020). What drives the adoption of sustainable production technology? Evidence from the large scale farming sector in East China. *Journal of Cleaner Production*, *257*, 120611.

Li, J., Jiang, R., and Tang, X. (2022).Assessing psychological factors on farmers' intention to apply organic manure: an application of extended theory of planned behavior. *Environment, Development and Sustainability*, 1-25**.**

Li, X., and Wu, X. (2021). The impact of social norms on rice farmers' behavior of organic fertilizers application: Mediating effect of value perception and moderating effect of education level. *International Journal of Low-Carbon Technologies*, *16*(4), 1492-1503.

Likert, R., (1932). Technique for the measurement of attitudes.*Archive Psychology*, 140: 55.

Malviya, A., Verma, J. and Dawar, A. 2020. Adoption Level of Farmers Regarding Organic Farming Practices in Madhya Pradesh state of India. *International Journal of Current Microbiology and Applied Sciences*, 9: 3551-3555.

Manideep, A. S., and Reddy, M. S. K. (2019). Intention to Adopt Organic Farming: An Empirical Analysis.*International Journal of Advanced Science and Technology*, 29: 8115 – 8122.

MasudParvez, K. Z. H., and Kabir, M. H.(2018) Adoption extent of organic vegetable farming in Bogra district, Bangladesh.*International Journal of Science and Business, 2*: 61-72.

Meemken, E. M., andQaim, M. (2018).Organic agriculture, food security, and the environment. *Annual Review of Resource Economics*, *10*, 39-63.

Monikha, C. R. (2016). Determinants of Adoption of Organic Farming Practices in Western Zone of Tamil Nadu. Unpub.*M.Sc. (Ag.) Thesis*, TNAU, Coimbatore

Motiwale (2017). A study on knowledge and adoption of organic farming practices by farmers in Indore district of M.P. Unpub. *M.Sc (Ag).Thesis*, R.A.K. College of Agriculture Sehore (M.P).

Mzoughi, N. (2011). Farmers adoption of integrated crop protection and organic farming: Do moral and social concerns matter?. *Ecological Economics*, *70*(8), 1536-1545.

Naik, V. R., L. B. Kunnal, S. S. Patil and S. S. Guledgudd (2012).Organic and Inorganic Cultivation of Chili and its Marketing – An Economic Analysis.*Karnataka Journal of Agricultural Sciences*, 25(2): 203-207.

Nandwani, D., Jamarkattel, D., Dahal, K. R., Poudel, R., Giri, S., and Joshi, T. N. (2021).Attitudes of fruit and vegetable farmers towards organic farming in Kathmandu Valley, Nepal. *Sustainability*, *13*(7), 3888.

Nguyen, T. P. L., Doan, X. H., Nguyen, T. T., and Nguyen, T. M. (2021).Factors affecting Vietnamese farmers' intention toward organic agricultural production. *International Journal of Social Economics*, *48*(8), 1213-1228.

NishaYadav. (2020). Socio economic determinants of adopting organic and conventional farming in Haryana. M.Sc. (Agri.) Thesis, CCS Haryana Agricultural University, Hisar.

Nunoo, I. and Frimpong, B. N. (2015).Factors affecting adoption of organic cocoa farming in Ghana.In *Proc. Regional Conference on Marketing and Innovation in Organic Farming*.

Okon, U. E. and Idiong, I. C. (2016).Factors influencing adoption of organic vegetable farming among farm households in south-south region of Nigeria. *Am. Eurasian J. Agric. Environ. Sci*, *16:* 852-859.

Patel Chirag (2015). Awareness and attitude of organic farming followersof south Gujrat.,*M.Sc. (Ag.) Thesis*, Navsari Agricultural University, Navsari, Gujarat.

Patidar, S. and Patidar, H. (2015).A study of perception of farmers towards organic farming. *International Journal of Application or Innovation in Engineering and Management*, *4*(3): 269-277

Philippos, Karipidis.,Sotiria, Karypidou. (2021). Factors that Impact Farmers’ Organic Conversion Decisions. Sustainability, doi: 10.3390/SU13094715

Prasanth.S. (2016).A study on adoption of organic farming by farmers of Andaman and Nicobar Islands *M.Sc. (Ag.)Thesis.*College of agriculture Rajendranagr, Hyderabad, India.

Priyanka Ingle (2020). Study on farmers attitude, knowledge and practices related to organic farming in Ratnagiri district, *M.Sc. (Ag.) Thesis*, DrBalasahebSawantKonkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharashtra.

Raahinipriya, P., and Rani, R. J. (2018).Marketing Behaviour of Organic Farmers in Karur district of Tamil Nadu. *Journal of Extension Education*, *30*(4).

Rana, R. and Singh, N. (2014). The use of social networking in academics: benefit and opportunity. *International Journal of Science and Research*.3(6): 1336-1339.

Ratana, Sapbamrer.,Ajchamon, Thammachai. (2021). A Systematic Review of Factors Influencing Farmers' Adoption of Organic Farming. Sustainability, doi: 10.3390/SU13073842

Rogers, E.M. (1995). Diffusion of innovations. *The Free Press*.4:205

Rogers, E.M. (2003). Diffusion of Innovations (5th edn). Free Press, New York, NY 10020.

Ruaykijakarn, N., Suwanmaneepong, S.andKuhaswonvetch, S. (2018). Knowledge and attitudes towards marketing innovation of organic rice farmers in Sanam Chai Khet organic agriculture group, Chachoengsao province, Thailand. *Technology*, *14*(7): 1829-1842.

Samarpitha, A., Vasudev, N. and Suhasini, K. (2016).Socio-economic characteristics of rice farmers in the combined state of andhrapradesh. *Asian Journal of Agricultural Extension, Economics and Sociology*, *13*(1): 1-9.

Sarker, M. A. R., Alam, K., and Gow, J. (2013).Assessing the determinants of rice farmers' adaptation strategies to climate change in Bangladesh. *International Journal of Climate Change Strategies and Management*.DOI.http://dx.doi.org/10.1108/IJCCSM-06-2012-0033

Sasidharan, A. (2015). Adoption of Organic Farming Technologies in Banana and Vegetable Growers of Kasargod District.Unpub.*M.Sc. (Ag.) Thesis*, Kerala Agricultural University, Thrissur.

Shams, A., and Fard, Z. H. M. (2017).Factors Affecting Wheat Farmers' Attitudes toward Organic Farming. *Polish Journal of Environmental Studies*, *26*(5). 2207–2214.

Sharifuddin, J., Mohammed, Z. A., and Terano, R. (2016).Rice farmers' perception and attitude toward organic farming adoption.

Sharifuddin, J., Mohammed, Z. and Terano, R. (2019).Paddy farmer's perception and factors influencing attitude and intention on adoption of organic rice farming. *International Food Research Journal*, *26*(1): S135-S145.

Shigwan, A.S (2019) Knowledge and attitude of the Konkan farmers towards organic farming practices Ph.D.*(Ag.)Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharashtra.

Singh, Bhagwan and Sharma, Arun. (2020). Factors Affecting Adoption of Organic Farming Technology in Arid Zone.*Annals of arid zone*. 58: 1-5.

Singh, P., Choudhary, M.andLakhera, J. P. (2016). Knowledge and attitude farmers towards improved wheat production technology. *Indian Research Journal of Extension Education*, *14*(2): 54-59.

Sivaraj, P., Philip, H., Chinnadurai, M., Asokhan, M., and Sathyamoorthi, K. (2017).Constraints and suggestions of certified organic farmers in practicing organic farming in western zone of Tamil Nadu, India. *International Journal of Current Microbiology and Applied Sciences ISSN*, 1270-1277.

Sok, J., Hogeveen, H., Elbers, A. R. W., and Lansink, A. O. (2016).Using farmers' attitude and social pressures to design voluntary Bluetongue vaccination strategies. *Preventive Veterinary Medicine*, *133*: 114-119.

Soni.J, (2016).Utilization pattern of social media by the students for education.*M.Sc. (Agri.)* (Unpub.) *Thesis,* G. B. Pant University of agriculture and technology, Pant Nagar, Uttarakhand.

Suwanmaneepong, S., Kerdsriserm, C., Iyapunya, K., and Wongtragoon, U. (2020).Farmers' adoption of organic rice production in Chachoengsao Province, Thailand. *Journal of Agricultural Extension*, *24*(2), 71-79.

Swain, M. (2015). Performance of crop yield and rainfall insurance schemes in Odisha: Some empirical findings. Agricultural Economics Research Review, 28 (2): 201- 211.

Takagi, C., Purnomo, S. H., and Kim, M. K. (2021).Adopting smart agriculture among organic farmers in Taiwan. *Asian Journal of Technology Innovation*, *29*(2), 180-195.

Taylor, D. E., Farias, L. M., Kahan, L. M., Talamo, J., Surdoval, A., McCoy, E. D., andDaupan, S. M. (2022). Understanding the challenges faced by Michigan's family farmers: race/ethnicity and the impacts of a pandemic. *Agriculture and Human Values*, 1-20. Retrieve from. https://doi.org/10.1007/s10460-022-10305-6

Taylor, S., and Todd, P. (1995). Decomposition and crossover effects in the theory of planned behaviour: A study of consumer adoption intentions. *International Journal of Research in Marketing*.12(2): 137-155.

Tegegne, M. A., Tesfahun, A. and Melak, A. (2021).Rice production, Technologies adoption and its determining factors in Fogera-plain of North West Ethiopia. *Int. J. Adv. Multidiscip. Res*, *8*(4): 17-29

Tuncer, A. G., and Boz, I. (2017).Comparison of conventional and organic farmers on their socioeconomic characteristics and communication behaviors. *International Journal of Scientific Research and Management*, *5*(6), 5354-5262.

Uhunamure, S. E., Kom, Z., Shale, K., Nethengwe, N. S., and Steyn, J. (2021).Perceptions of smallholder farmers towards organic farming in South Africa. *Agriculture*, *11*(11), 1157.

Umar, S., Hali, M. R.andBunza, F. S. (2015). Factors influencing Adoption of improved Rice Production Technology (IRPT) Under Anchor Borrowers Programme (ABP) In Kebbi State. *Journal of Agriculture and Veterinary Science,*(12): 19-26.

Van Dijk, W. F., Lokhorst, A. M., Berendse, F., and De Snoo, G. R. (2016).Factors underlying farmers' intentions to perform unsubsidisedagri-environmental measures. *Land use policy*, *59*: 207-216.

Westaby, J. D. (2005). Behavioral reasoning theory: Identifying new linkages underlying intentions and behavior. *Organizational behavior and human decision processes*, *98*(2): 97-120.

Wijaya, T., Utama, A., and Rahmawaty, P. (2018).Motivation and barriers of organic agricultural production system adoption in Yogyakarta-Indonesia. *Delhi Business Review*, *19*(2), 15-22.

Yanakittkul, P. and Aungvaravong, C. (2020). A model of farmers intentions towards organic farming: A case study on rice farming in Thailand. *Heliyon*, 6 (1): 1-9.

Yanakittkul, P., and Aungvaravong, C. (2019).Proposed conceptual framework for studying the organic farmer behaviors. *Kasetsart Journal of Social Sciences*, *40*(2): 491-498.

Zhllima, E., Shahu, E., Xhoxhi, O.andGjika, I. (2021). Understanding farmers' intentions to adopt organic farming in Albania. *New Medit*, *20*(5): 97-111.

APPENDICES

APPENDIX I

List of selected villages for survey

Sl. No.	Village name	Tehsil	District
1.	Devade	Sangmeshar	Ratnagiri
2.	Kirbet		
3.	Sadaye		
4.	Bhovade		
5.	Katavali		
6.	Devale		
7.	Devrukh		
8.	Fansat		
9.	Khanu	Lanja	
10.	Anjani	Khed	
11.	Bhile	Chiplun	
12.	DhameliKond		
13.	Gane		
14.	Kelye	Ratnagiri	
15.	Barasgaon	Mahad	Raigarh
16.	Underi		
17.	Walang		
18.	Adiste		
19.	Temghar	Roha	
20.	Khambere		
21.	Deole	Poladpur	
22.	Lahulase		
23.	Mahalunge		
24.	Ranawadi Bk.		
25.	Shedashi	Pen	
26.	Kamarli		

APPENDIX II

List of organic farmers.

Sl. No.	Name of the respondents	Village	Tehsils	District
1	Dinesh DhonduVadaye	Devade	Sangmeshar	Ratnagiri
2	HariGovindDhumake	Devade	Sangmeshar	Ratnagiri
3	ChandrashekharShantaramBerde	Devade	Sangmeshwar	Ratnagiri
4	VitthalTukaramTalekar	Devade	Sangmeshwar	Ratnagiri
5	DnyandevMahadevShedage	Devade	Sangmeshwar	Ratnagiri
6	Suresh MahadevDhumak	Devade	Sangmeshwar	Ratnagiri
7	LaxmanSitaramDhumak	Devade	Sangmeshwar	Ratnagiri
8	SubhashGanpatShedage	Devade	Sangmeshwar	Ratnagiri
9	SiddharthGanpatKabale	Devade	Sangmeshwar	Ratnagiri
10	SharadRaghunathBerde	Devade	Sangmeshwar	Ratnagiri
11	ShubhashJayramKambale	Devade	Sangmeshwar	Ratnagiri
12	GangaramPandurangTalekar	Devade	Sangmeshwar	Ratnagiri
13	GanpatBhagaChinchavalkar	Kirbet	Sangmeshwar	Ratnagiri
14	Vijay Vilas Jangam	Kirbet	Sangmeshwar	Ratnagiri
15	EknathRajabhauShedage	Kirbet	Sangmeshwar	Ratnagiri
16	HariGovindDhumak	Kirbet	Sangmeshwar	Ratnagiri
17	DattaramJayramChinchavalkar	Kirbet	Sangmeshwar	Ratnagiri
18	Vilas TukaramVadaye	Bhovade	Sangmeshwar	Ratnagiri
19	MahendraKeshavAkhan	Bhovade	Sangmeshwar	Ratnagiri
20	Suresh ShivramBaing	Bhovade	Sangmeshwar	Ratnagiri
21	KashiramLaxmanChache	Bhovade	Sangmeshwar	Ratnagiri
22	ChandanSakharamAnkushraav	Bhovade	Sangmeshwar	Ratnagiri
23	SudhakarTukaramGhag	Katavali	Sangmeshwar	Ratnagiri
24	Vijay Narayan Purohit	Katavali	Sangmeshwar	Ratnagiri
25	Mahesh HantaramGhaag	Katavali	Sangmeshwar	Ratnagiri
26	YogeshShashikantPendharkar	Katavali	Sangmeshwar	Ratnagiri
27	PurshottamDattatrayPendharkar	Katavali	Sangmeshwar	Ratnagiri
28	Ashok Narayan Gandhi	Devale	Sangmeshwar	Ratnagiri
29	Sanjay DattaramChavhna	Devale	Sangmeshwar	Ratnagiri
30	MangeshRamchandraRane	Devale	Sangmeshwar	Ratnagiri
31	ChandrakantVitthalPanchal	Devale	Sangmeshwar	Ratnagiri
32	ShivajiKeruRahate	Devale	Sangmeshwar	Ratnagiri
33	Vijay VamanPanchal	Devale	Sangmeshwar	Ratnagiri
34	ShreeramKeruRahate	Devale	Sangmeshwar	Ratnagiri
35	PandurangJayramKadam	Devrukh	Sangmeshwar	Ratnagiri
36	Narayan GunajiBotake	Devrukh	Sangmeshwar	Ratnagiri
37	VithobaGangaramMundekar	Devrukh	Sangmeshwar	Ratnagiri
38	SantoshKisanPadye	Devrukh	Sangmeshwar	Ratnagiri
39	AnantDoulatPatade	Devrukh	Sangmeshwar	Ratnagiri
40	GanpatWamanKhamkar	Fansat	Sangmeshwar	Ratnagiri
41	Mangesh Vital Khamkar	Fansat	Sangmeshwar	Ratnagiri
42	Sanjay ChandrakantKhamkar	Fansat	Sangmeshwar	Ratnagiri

Sl. No.	Name of the respondents	Village	Tehsils	District
43	KrushnaChandrakantKhamkar	Fansat	Sangmeshwar	Ratnagiri
44	Mangesh Shankar Shitap	Fansat	Sangmeshwar	Ratnagiri
45	Milind Suresh Malvankar	Khanu	Lanja	Ratnagiri
46	AnantSinde	Khanu	Lanja	Ratnagiri
47	SunilChavan	Khanu	Lanja	Ratnagiri
48	Santosh Joshi	Khanu	Lanja	Ratnagiri
49	GajananTukaramPaar	Khanu	Lanja	Ratnagiri
50	SuryakantKhatkul	Khanu	Lanja	Ratnagiri
51	AnkitaAnantSuare	Khanu	Lanja	Ratnagiri
52	Dashrath Rama Bhovad	Khanu	Lanja	Ratnagiri
53	Sunil HariBhalekar	Anjani	Khed	Ratnagiri
54	DipakHarichandraKamble	Anjani	Khed	Ratnagiri
55	Narayan BabuKambale	Anjani	Khed	Ratnagiri
56	Narayan PandurangKamble	Anjani	Khed	Ratnagiri
57	Ashok KashiramTambe	Anjani	Khed	Ratnagiri
58	Sunil HariBhalekar	Anjani	Khed	Ratnagiri
59	DipakHarichandraKamble	Anjani	Khed	Ratnagiri
60	Suresh LaxmanGudekar	Bhile	Chiplun	Ratnagiri
61	PrataprаoDattaramThasale	Bhile	Chiplun	Ratnagiri
62	HarishchandraLaxmanGudekar	Bhile	Chiplun	Ratnagiri
63	AravindShrikrushnKetkar	Bhile	Chiplun	Ratnagiri
64	TukaramPandurangGudekar	Bhile	Chiplun	Ratnagiri
65	RamchandraSakharamBhuran	DhameliKond	Chiplun	Ratnagiri
66	KiranArjunKasar	DhameliKond	Chiplun	Ratnagiri
67	GangaramRamjiThasale	DhameliKond	Chiplun	Ratnagiri
68	NandkumarBhagojiKamble	Gane	Chiplun	Ratnagiri
69	Shankar KashiramBhuvad	Gane	Chiplun	Ratnagiri
70	Sanjay GajananKanhere	Gane	Chiplun	Ratnagiri
71	AnantGanapatAayare	Gane	Chiplun	Ratnagiri
72	AnantDagaduDalvi	Gane	Chiplun	Ratnagiri
73	ShrihariVitthal Desai	Kelye	Ratnagiri	Ratnagiri
74	Vijay DattatraySahastrabuddhe	Kelye	Ratnagiri	Ratnagiri
75	Sunil HariSahastrabuddhe	Kelye	Ratnagiri	Ratnagiri
76	VinayakKeshavVakankar	Kelye	Ratnagiri	Ratnagiri
77	SwarupShrihari Desai	Kelye	Ratnagiri	Ratnagiri
78	MadhukarBaburaoZanje	Barasgaon	Mahad	Raigarh
79	Bhagoji Shankar Zanje	Barasgaon	Mahad	Raigarh
80	Sakharam Narayan Jadhav	Barasgaon	Mahad	Raigarh
81	Madhukar Genu Zanje	Barasgaon	Mahad	Raigarh
82	LakshmanSadashivJadhav	Barasgaon	Mahad	Raigarh
83	ShivramTukaramJhanje	Underi	Mahad	Raigarh
84	ShaileshNathuramUtekar	Underi	Mahad	Raigarh
85	SantoshHanumantJadhav	Underi	Mahad	Raigarh
86	Sanjay MarutiZanje	Underi	Mahad	Raigarh
87	KisanSakharamZanje	Underi	Mahad	Raigarh
88	Sanjay BaliramWadkar	Walang	Mahad	Raigarh
89	SubhashRambhauWadkar	Walang	Mahad	Raigarh

Sl. No.	Name of the respondents	Village	Tehsils	District
90	DilipMahadevSalavi	Walang	Mahad	Raigarh
91	RavindraBanushethSagvekar	Walang	Mahad	Raigarh
92	AnkushShantaramMhamunkar	Walang	Mahad	Raigarh
93	RoshanMadhukarPandirkar	Adiste	Mahad	Raigarh
94	EknathRambhauWadkar	Adiste	Mahad	Raigarh
95	MangeshDattaramDhadave	Adiste	Mahad	Raigarh
96	Prakash Narayan Kolate	Adiste	Mahad	Raigarh
97	VasantKeshavJadhav	Adiste	Mahad	Raigarh
98	KiranDattaramJadhav	Temghar	Roha	Raigarh
99	AbhimanyuAnantBhoir	Temghar	Roha	Raigarh
100	Narayan MahadevGhanekar	Temghar	Roha	Raigarh
101	Vittal Ganesh More	Temghar	Roha	Raigarh
102	YashvantDagduJogde	Temghar	Roha	Raigarh
103	Ashok KanuSode	Khambere	Roha	Raigarh
104	SakharamMahadevPalaskar	Khambere	Roha	Raigarh
105	Mahesh BaluSode	Khambere	Roha	Raigarh
106	ChandrakantGovindSalvi	Khambere	Roha	Raigarh
107	PandurangJanu More	Khambere	Roha	Raigarh
108	ShridharDagduPadwal	Temghar	Roha	Raigarh
109	BalaramDagduBenare	Temghar	Roha	Raigarh
110	Vijay Ganesh More	Temghar	Roha	Raigarh
111	VithobaMahadevBhuvad	Temghar	Roha	Raigarh
112	MukundSakharamShinde	Temghar	Roha	Raigarh
113	DattaramBhiwaGhadage	Temghar	Roha	Raigarh
114	ChandrashekharShantaramBerde	Temghar	Roha	Raigarh
115	VitthalTukaramTalekar	Temghar	Roha	Raigarh
116	Vikram Shankar Kesarkar	Deole	Poladpur	Raigarh
117	RamchandraBhikuGhadge	Deole	Poladpur	Raigarh
118	Vishnu Raghu Parte	Deole	Poladpur	Raigarh
119	DhondiramPandurangUtekar	Deole	Poladpur	Raigarh
120	GautamAmrutaJadhav	Deole	Poladpur	Raigarh
121	Genu RayabaGhadge	Deole	Poladpur	Raigarh
122	ChandruTukaramGhadge	Deole	Poladpur	Raigarh
123	DhondiramGangaramRinge	Lahulase	Poladpur	Raigarh
124	VitthalDagadu Parte	Lahulase	Poladpur	Raigarh
125	DagaduGanpat Parte	Lahulase	Poladpur	Raigarh
126	PradeepVithobaKesarkar	Lahulase	Poladpur	Raigarh
127	RavindraRaghunathKesarkar	Lahulase	Poladpur	Raigarh
128	RamchandraRakhmajiDhavale	Mahalunge	Poladpur	Raigarh
129	VithalPandurang Sane	Mahalunge	Poladpur	Raigarh
130	GovindBhivaUtekar	Mahalunge	Poladpur	Raigarh
131	BaliramRayabaUtekar	Mahalunge	Poladpur	Raigarh
132	MahadevTataybaUtekar	Mahalunge	Poladpur	Raigarh
133	NathuramBhagoji More	Ranawadi Bk.	Poladpur	Raigarh
134	MahipatiBabuUtekar	Ranawadi Bk.	Poladpur	Raigarh
135	AvindraPandurangUtekar	Ranawadi Bk.	Poladpur	Raigarh
136	PandurangKondibaVandre	Ranawadi Bk.	Poladpur	Raigarh

Sl. No.	Name of the respondents	Village	Tehsils	District
137	VikasParakashNalavade	Ranawadi Bk.	Poladpur	Raigarh
138	Yashwant Narayan Waghmare	Shedashi	Pen	Raigarh
139	NaguMahaduWagh	Shedashi	Pen	Raigarh
140	MhaduGomaShid	Shedashi	Pen	Raigarh
141	RahiNaguBhala	Shedashi	Pen	Raigarh
142	Narayan KanuWagh	Shedashi	Pen	Raigarh
143	NathuHariWaghmare	Kamarli	Pen	Raigarh
144	MhaduAambuBhala	Kamarli	Pen	Raigarh
145	MahaduKhanduWargude	Kamarli	Pen	Raigarh
146	BundhyaAmbajiLendi	Kamarli	Pen	Raigarh
147	KushaSakhya Dore	Kamarli	Pen	Raigarh
148	PadyaMahaduParadhi	Kamarli	Pen	Raigarh
149	NamdeoKhanduWarguda	Kamarli	Pen	Raigarh
150	KashyaLaxmanShid	Kamarli	Pen	Raigarh

APPENDIX III

Dr.BalasahebSawantKonkanKrishiVidyapeeth

Department of Extension Education

College of Agriculture, Dapoli-415712, District: Ratnagiri

Determining Farmers Intention towards Adoption of Organic Agricultural Practices using Structural Equation Modeling (SEM)

INTERVIEW SCHEDULE

GENERAL INFORMATION

Respondent Code: RF / RR / RP / RO / RV. Respondent No: ………………………….

Name of the Respondent:

…………………………………………...…......................................

Name of the Village: ………………………………Mobile No:

....

Taluka:…………………………….………District: …………..……………………

Date of Interview…………………………Place of Interview……..………...…………

PART A

A. Socioeconomic, institutional and agroecological characteristics of the farmers

1) What is your current age in completed years?...

2) Have you received any formal education? Yes/No.If'Yes,' please specify (Std)……………

3) How many hectares of land do you currently use for organic farming?..................................

4) What is your total annual income from farming activities?Rs..

5) How many years have you been actively involved in organic farming?..................................

6) Have you ever interacted with an extension organization?Yes/No. If 'Yes' Which of the following extension organizations have you accessed? Please share your response.

Sl. No	Extension organizations	Response	
		Yes	No
a.	*Frontline extension organizations*		
i.	ICAR research institutes		
ii.	State Agricultural University		
iii.	KrishiVigyan Kendra (KVK)		

iv.	Agriculture Technology Information Centre (ATIC)		
b.	*Main extension organizations*		
v.	State Department of Agriculture		
vi.	Panchayat Raj Institutes (*Gram Panchayat, PanchayatSamitee, ZillaParishad*)		
vii.	Agriculture Technology Management Agency (ATMA)		
c.	*Other extension organizations*		
viii.	Private extension organizations		
ix.	Non-government organizations (NGOs)		

7) Access to credit

a) Have you accessed crop loans in the past for agricultural purposes? Yes/No.

b) If 'Yes'Please provide the specific loan amount

Rs……………………………………………

8) Access to crop insurance

a) Are you enrolled to the PradhanMantriFasalBimaYojana? Yes/No.

b) If you are enrolled in the PradhanMantriFasalBimaYojana, how much premium amount have you paid? Rs…………………………………………………………………………

c) Have you been compensated under the PradhanMantriFasalBimaYojana for any crop losses? Yes/No.

d) If 'Yes,' could you please specify the amount you received?Rs…………………………...

e) Have you faced any difficulties in accessing crop insurance? Yes/No.

f) Please share the difficulties you have encountered.

…………………………………………………………………………………………...………

……………………………………………………………………………………………

9) Which social media platforms do you primarily use to access agricultural information? Please share your response.

Sl. No	**Social media**	**Response**		**Usage frequency**		
		Yes	**No**	**Always**	**Sometimes**	**Never**
i.	WhatsApp					
ii.	Facebook					

iii.	LinkedIn					
iv.	You Tube					
v.	Twitter					
vi.	Agricultural App (Please specify names, if any)					
	i.					
	ii.					
	iii.					

10) What is the topography of the land where you practice rice-based organic farming?Please respond with options: Upland ☐ Midland ☐ Lowland ☐

11) What type of soil do you have in your organic farm?

a) Medium black ☐

b) Lateritic ☐

c) Coastal alluvial ☐

d) Coastal saline ☐

12) What is the age of your organic farm in years?...

13) Do you currently possess any livestock? Yes/No. If yes, please specify the number of livestock you have for each category listed below:

Sl. No	**Type of livestock**	**Number of livestock**		
		Local	**Improved/ Crossbreed**	**Total**
i.	Bullocks			
ii.	Cows			
iii.	Buffaloes			
iv.	Goat			
v.	Poultry			

14) Which of the following organic inputs do you produce on your farm? Please provide details for each of the organic inputs you produce:

Sl. No	Organic input	Response		Ingredients used	Production quantity (Kg/Litre/Ton)
		Yes	No		
7)	Manure				
v.	FYM				
vi.	Poultry litter				
vii.	Fish meal				
viii.	Vermicompost				
ix.	Vermiwash				
x.	Cow dung				
xi.	Cow Urine				
8)	Green manures				
ii.	Glyricidia				
iii.	Cow pea				
iv.	Dhencha				
9)	*Beejamrut*				
10)	*Jeevamrut*				
11)	*Panchgavya*				
12)	Bio-pesticides				
iii.	*Dashaparni ark*				
iv.	Garlic-Chilli-Butter Milk(*Lamita*)extract				
v.	Neem extract				
13)	Other (Please, specify)				

15) Which of the following rice-based cropping systems have you adopted on your organic farm?

a) Rice-Fallow ☐

b) Rice-Rice ☐

c) Rice-Pulses ☐

d) Rice-Oilseeds ☐

e) Rice-Vegetable ☐

16) Adoption of organic agricultural practices

Which organic agricultural practices have you adopted in your rice-based cropping systems? Please give your response as ‘yes’ or ‘no’.

Sl. No.	Organic agriculture practices	Rice-based cropping systems									
		Rice-Fallow		Rice-Rice		Rice-Pulses		Rice-Oilseeds		Rice-Vegetables	
		Adopted	Not-adopted	Adopted	Not-adopted	Adopted	Not-adopted	Adopted	Not-adopted	Adopted	Not-adopted
1)	Minimum /Zero tillage										
2)	Manuring (FYM/Green manure/Vermicompost / Neemcake)										
3)	*BeejSanskar*/Seed treatment (Beejamrut/Biofertilizers)										
4)	Bio-mulching (Rice straw/ Glyricidia leaves)										
5)	Nutrient management (*Jeevamrut / Panchgavya /* Cow Urine / Vermiwash)										
6)	Biopesticides (*Dashaparni ark* / Garlic-Chilli-Butter Milk extract / Neem extract)										
7)	Inter-cropping / Trap crop										
8)	Crop rotation										

17) Yield and income

Please provide details regarding the yield and income obtained from your existing rice-based cropping system during the last season.

Sl. No	**Cropping system**	***Kharif* season**			***Rabi* season**		
		Area (ha)	**Yield (Q/ha)**	**Gross Income (Rs)**	**Area (ha)**	**Yield (Q/ha)**	**Gross Income (Rs)**
1)	Rice-Fallow						
2)	Rice-Rice						
3)	Rice-Pulses						
4)	Rice-Oilseeds						
5)	Rice-Vegetable						

18) To whom do you sell your organic farm produce?

Sl. No	**Particular**	**Type of farm produce**			
		Rice	**Pulses**	**Oilseeds**	**Vegetables**
1)	Consumers				
2)	Village traders				
3)	Cooperative society				
4)	Retailers				
5)	Wholesalers				

PART B

19) **Extended Theory of Planned Behaviour (TPB)**

19.1) Intention

What is your intention behind adopting organic agricultural practices? Please rate your responses to the statements regarding intention. In this scale,strongly agree (SA)= 5, agree (A)= 4, undecided (UD)= 3, disagree (DA)= 2 and,strongly disagree (SDA)= 1.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	I have adopted organic agricultural practices to achieve sustainability on my farm.					
2	I adopt organic agricultural practices to provide my family with toxin-free food.					
3	I believe the adoption of organic agricultural practices improves the quality of farm produce.					
4	I have adopted organic agricultural practices simply because others have done so. *					
5	My intention to adopt organic agricultural practices is driven by the relative economic advantages associated with it.					
6	I only practice organic agriculture because I want to reap the benefits of government schemes. *					
7	I adopt organic agricultural practices because I am concerned about soil health.					
8	I can demonstrate the value of organic agricultural practices by adopting them.					
9	Health-related factors influence my decisionto engage in organic agriculture.					
10	I intend to adopt organic agricultural practices consistently in the near future.					

19.2) Attitude

What motivates you to adopt organic agriculture practices? Please provide your responses to the following itemsrepresenting attitude towards organic agriculture.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	Wherever I go, I emphasize the importance of practicing organic agriculture.					
2	I feel that transitioning from an ‘inorganic farm’ to an ‘organic farm’ is a waste of time. *					
3	I think organic agriculture is an only way to preserve our cultureand traditions.					
4	I assure that the adoption of organic agriculture practices requires additional manpower. *					
5	I am confident that organic agricultural practices reduce the production cost.					
6	Exclusive adoption of organic agricultural practices in commercial farming is impossible. *					
7	I am sure that transitioning to organic agriculture means reducing your farm income*					
8	I recognize organic agricultural practices to foster their widespread adoption.					
9	Merely adopting organic practices is unlikely to produce nutritious food. *					

19.3) Subjective norms

What factors influences you for adopting organic agricultural practices? Please rate your responsesto the statements regarding subjective norms.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	I experience peer pressure from my neighbourhood to practice organic agriculture.					
2	There is a continuous demand from my family to adopt organic agriculture.					
3	The concept of group farming has influenced me to adopt organic agriculture.					
4	The social media and public discourse often exaggerate the benefits of organic agriculture. *					
5	When I talk with fellow farmers about organic agriculture,					

	I get positive responses.					
6	Important people in my life criticize me for adopting organic agriculture. *					
7	I am being persuaded by progressive farmers from my village to adopt organic agriculture.					
8	I think that the government's policies to promote organic agriculture are inadequate. *					
9	I am witnessing a growing number of organic farmers in my area.					
10	I respect the opinions of those who think organic agriculture is advantageous.					

19.4) Perceived behavioural control

Kindlyprovide your responses to the statements regarding perceived behavioral control in adopting organic agricultural practices.

Sl. No.	**Items/Statements**	**Response**				
		SA	**A**	**UD**	**DA**	**SDA**
1	I am capable of managing my farm in accordance with the prescribed organic standards.					
2	I believe that adopting organic agricultural practices is beyond my economic condition. *					
3	I exercise control over the judicious use of farm inputs in organic agriculture.					
4	I have the necessary farm resources to adopt organic agricultural practices.					
5	Occasionally, I find myself in favour of secretly using inorganic inputs in organic agriculture. *					
6	I have trust in my ability to overcome obstacles while adopting organic agriculture.					
7	I believe that only individuals with specialized skills can successfully adopt organic agricultural practices. *					
8	I perceive that my autonomy in adopting organic agricultural practices is limited. *					
9	I do organic agriculture with enough dedication and time.					
10	I have a social network that supports successful engagement in organic agriculture.					

19.5) **Health consciousness**

What factors motivate you to adopt organic agriculture? Kindly give your responsestothe items related to health consciousness.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	My family can consume safe foodIf I practice organic agriculture.					
2	I am conscious of the potential nutrition benefits associated with organic food.					
3	Consuming organic food contributes to better physical fitness of an individual.					
4	People unnecessarily over-exaggerate the health benefits of organic food. *					
5	I like to eat organic food due to its distinct taste.					
6	I believe that practicing organic agriculture is incompatible with my health-conscious lifestyle. *					
7	Organic agriculture brings me peace of mind while actively contributing to creating a healthier society.					
8	Our forefathers had long lives because they consumed organic food.					

19.6) Food security concerns

Please provide your ratings to following statements indicating food security concerns.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	I feel that engaging in organic agriculture has helped me enough food for my family.					
2	I think relying solely on organic agriculture could lead to food crises in the country. *					
3	I think that organic agriculture can increase the resilience of our food system.					
4	Attaining the goal of national food security only through organic agriculture is impossible. *					
5	I believe that promoting organic agriculture leads to an increased dependence on exotic food. *					
6	Promoting organic agriculture is essential to ensure food security for next-generations.					
7	People around me consider that the organic farming system can produce sustainable food.					
8	Organic agriculture can enhance food security by fostering local food systems.					

19.7) Marketability

What marketing attributes motivate you for adoption of organic agricultural practices? Kindly give your responses to a series of items regarding marketability of organic products.

Sl. No.	Items/Statements	Response				
		SA	A	UD	DA	SDA
1	Consumers are willing to pay a premium for organically grown agricultural products.					
2	The rising market demand for organic products led me to adopt organic agriculture.					
3	The market for organic products is merely restricted to the rich class. *					
4	Exporting organic farm produce to the global market is easily achievable.					
5	There is a high demand for organic agricultural products in food malls and supermarkets.					
6	Selling organic farm products in a local market is difficult for me. *					
7	Organic agricultural products have a competitive advantage over conventional products.					

PART C

20) What constraints do you face when it comes to adopting organic agricultural practices?

What constraints do you encounter in the marketing of organic farm produce?

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21) What suggestions do you offer to encourage the adoption of organic agricultural practices?

What suggestions do you have for enhancing the marketing of organic farm produce?

Observations of the researcher, if any

Thank you!!

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ABSTRACT

The Green Revolution in India has transformed the nation into a food surplus economy, yet its associated environmental degradation necessitates a shift towards sustainable farming. Organic farming has emerged as a viable alternative, prompting government initiatives to promote its adoption. This study employs the Theory of Planned Behavior (TPB) to investigate the factors that influence farmers' intentions to adopt organic farming in the Konkan region, focusing on socioeconomic, institutional, and agroecological aspects. Two districts, Ratnagiri, and Raigad, representing distinct agroclimatic zones were studied, encompassing 150 organic farmers. The study found that middle-aged farmers dominate the landscape, motivated by health

awareness and market demand. Education up to the secondary level is prevalent, which enhances the acceptance of sustainable practices. Limited landholdings necessitate strategies for optimal productivity. Despite these challenges, organic farming is economically viable with a moderate level of farmer expertise. Extension services have effectively reached farmers with a notable reliance on institutional credit. The TPB analysis revealed a positive attitude among farmers, influenced by subjective norms and health consciousness. Perceived behavioral control and concerns over food security and marketability impact adoption intentions. Structural equation modeling validates the extended TPB, highlighting the significant role of attitude and marketability in predicting farmers' intentions. Direct selling has emerged as the preferred marketing channel, emphasizing the need for supportive policies. This study's implications stress the importance of targeted extension educational campaigns, support for farmers with critical inputs, strategies for optimizing limited land, and policies fostering economic and environmental sustainability. These findings contribute to a comprehensive understanding of organic farming adoption, providing valuable insights for policymakers, extension services, and agricultural planners in fostering a sustainable and environmentally friendly agricultural landscape. Future research opportunities include longitudinal studies, cross-cultural comparisons, and in-depth analyses of non-significant relationships to refine strategies and inform policies for the transformative journey towards sustainable agriculture.Exploring the role of organic farming in climate change resilience and conducting social network analyses can contribute valuable insights for the sustainable transformation of the agri-food system.

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