

Challenges and Prospects in Organic Farming with Special Reference to the State of Sikkim

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ABSTRACT

The concept of organic farming has been developed over time by practitioners and calls for a great deal of understanding. The concept of organic farming originated in India. Crop rotation, mixed farming, and mixed cropping are examples of environmentally beneficial farming methods that are credited to ancient Indian farmers. The main problems with organic farming today include yield reduction while switching to organic farming, improving soil fertility, integrating animals, certification challenges, environment, marketing, and policy support. The agriculture community in the state of Sikkim has long practised organic farming. The study examined the development of organic farming in Sikkim, where over 80% of the population still relies on farming and related professions. By adopting 100% organic farming, the state has become the first organic state, protecting its rich natural resources, including its diverse flora and fauna, healthy ecology, and fertile soil with a high organic content matter. In recent years, it has emerged as a significant exporter of fruits, flowers, spices, and vegetables. This paper has reviewed the Indian and Sikkim scenario concerning organic farming. It also describes the different stages of organic farming in Sikkim, India, the stakeholders involved, the infrastructure, as well as the financial and marketing constraints for higher output and income realisation. This study aims to explore the challenges faced by Sikkim in organic farming and their respective causes and solutions. It further explores the development prospects in organic farming in Sikkim and the benefits of its organic farmers. This study describes the various phases of organic farming in Sikkim, associated stakeholders and constraints in terms of infrastructure particularly irrigation, financial and marketing constraints for higher output and income realization.

Key Words: Organic Farming, Sustainable Development, Organic Mission, Conventional Farming System, Alternative Farming Practices.

1. Introduction

India has the second-largest population on the entire planet. The amount of arable land available is decreasing daily due to population growth, and demand for land from other industries is also rising steadily. Furthermore, better agricultural land productivity and soil health are required to meet the rising population's demands for food, fibre, fuel, fodder, and other necessities. The green revolution of the post-independence era provided developing nations with a roadmap for achieving food self-sufficiency, but maintaining agricultural output in the face of limited and depleting natural resource bases necessitated switching from "resource degrading" chemical agriculture to "resource protective" biological or organic agriculture.

For the majority of the time, the production output has increased thanks to green revolution technologies

including increased use of fertilisers and pesticides, adoption of nutrient-responsive, high-yielding crop varieties, increased exploitation of irrigation potentials, etc. The constant and indiscriminate use of these large energy inputs, however, resulted in a loss in crop yield and productivity as well as in the health of the soil and the ecosystem.

In India, approximately 30% of the total cultivable area is fertilised where irrigation facilities are available, and only a small amount of fertiliser is applied to the remaining 70% of arable land, which is primarily rainfed. Farmers in these regions employ organic manure as a source of readily accessible nutrients on their farms or in their communities. Due to the low use of chemical inputs, India's North Eastern Region (NER) and its numerous backward tribal hilly areas provide significant

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opportunities for organic farming. The Northeast region is thought to have 18 million hectares of such terrain that might be used for organic farming.

A significant portion of the native population of Sikkim depends on agriculture for their livelihood and financial stability. Abiotic and biotic conditions, however, have limited the expansion. To ensure their economic, dietary, and food security, it is estimated that more than 80% of rural residents depend on agriculture and related industries. The Sikkim agricultural practices are a result of years of farmer innovation and integration with the local ecosystems. With the implementation of contemporary technologies, farmers' lifestyles have only slightly improved.

The state of Sikkim has numerous inherent advantages that mostly favour organic farming. In line with our natural resources, the policies and programmes on organic farming aim to transform Sikkim into a model organic state.

A significant departmental intervention has resulted from the move toward organic farming. The Agriculture and Horticulture departments have undertaken a significant number of initiatives.

1.1 An Overview of Organic Farming

Organic farming is not a novel idea; it has a long history and tradition in our Indian farming system. By avoiding the use of various synthetic chemicals or gene-editing techniques, organic farming has its system for preventing pests and diseases from spreading while cultivating crops and livestock. Different organic agricultural practices are used in the country's varied climate, and by default, forest products come into this group. Due to its favourable effects on the ecosystem, organic farming is becoming more popular among all types of farming systems. Additionally, because organic farming requires a lot of labour, it boosts rural employment and long-term improvements in resource quality.

"Organic agriculture is a holistic production management method that maintains and increases the health of the agro-ecosystem, including biodiversity, biological cycles, and soil biological activity. While taking into account the regional conditions that necessitate regionally adapted systems, it emphasizes the employment of management strategies over the usage of off-farm inputs. This is accomplished by synthetic materials to fulfill any given systemic function." (FAO/WHO Codex Alimentarius Commission, 1999).

1.2 Present Status of Organic Farming in India

India is currently ranked first in the world for the overall

number of producers and India is at ninth rank in terms of world organic agricultural land. With 2.59 percent or 1.5 million hectares, of the world's total (57.8 million hectares), India is the country where 30 percent of all organic growers are found (World of Organic Agriculture 2018 report). However, the majority of our organic farmers are also having difficulties as a result of weak legislative measures, limited knowledge, rising input costs, and a lack of market awareness (ASSOCHAM report, 2018). Sikkim, the nation's first organic state, was not found to be accompanied by a rise in the supply of organic manure and access to it, according to a report by the Delhi-based Centre for Science and Environment. By employing the necessary management techniques, Sikkim is well on its way to becoming the finest state for organic farming. IFOAM through a campaign like Honest Food and the Government of India is with many schemes, programmes, and projects for encouraging farmers and consumers towards organic farming and organic food.

1.3 Objective of the Study

- To explore the challenges faced by Sikkim in organic farming.
- To explore causes and solutions to challenges and the development prospects in organic farming in Sikkim.
- To find out the benefits of farmers using organic farming in the state of Sikkim.

1.4 Statement of Problem

The farming community in the state of Sikkim has traditionally preferred organic farming as a method. However, throughout time, chemical pesticides and fertilisers took the role of organic nutrients. There are a lot of descriptive works and very few exploratory ones in the literature about Sikkim. Research on organic agriculture in the state would be helpful for Sikkim and the nation as a whole if modern challenges like community development and sustainable livelihood were taken into account. In the current environment, where Sikkim is the nation's first organic state and other states want to adopt its model, this will have particularly resonant implications. The current study may be useful for Sikkim's development of sustainable livelihood practises and organic farming, as well as for policymakers and agriculturalists. The study has created a case study that examines the challenges of organic farming in Sikkim and its impact on farmers' livelihoods and the state's economy based on a survey the authors performed. Additionally, it explores the issues that follow organic farming and how to solve them. As a result, it might be useful for offering a more comprehensive perspective on organic agriculture as it is practised in the state of Sikkim.

1.5 Organic Farming in Sikkim

With just 7096 km² (709,600 hectares) of territory and 6 lakh people, Sikkim became Indian Republic's 22nd state in 1975 (Census 2011). Only 10.47% of the land is used for farming, while the remainder is unusable space, cultural waste, permanent pastures, forest area, and arid land. In contrast to the national average of 75%, about 85% of the population in North, South, and West Sikkim still resides in rural areas. With only an 8% contribution to the state economy, more than 60% of the population of the state depends on agriculture and related activities for their livelihood. As a result, in early 2003, the Sikkim Legislative Assembly issued a resolution to adopt organic farming after seeing the future potential of agriculture for more equitable and rapid growth. Before Sikkim Organic Mission began on August 15, 2010, this pace could not pick up speed. State-wide, there is about 74,000 ha of certified organic agricultural land. The nation's first fully organic farming state, Sikkim, adopted this policy towards the end of December 2015 and became the first state in the nation to do so. The integrated agricultural system that has been used since the dawn of time involves the co-dependence and co-growing of both crops and animals. Due to a lack of reliable irrigation infrastructure and a geographically steep position, farming is done in conditions that are dependent on rain. To maximise economic return, the focus is placed on high-value, low-volume crops. Crops suitable for subtropical-to-temperate climates can be grown in the state due to its diverse agroclimatic conditions.

1.6 Organic Mission in Sikkim

Sikkim Organic Mission" an ingenious flagship project of the Government of Sikkim was introduced to millions of Indian viewers through 'Satyamev Jayate', a popular talk show hosted by Aamir Khan in 2012. As the world becomes more worried about the use of chemical pesticides and fertilisers in agricultural products, the Organic Mission of Sikkim continues to be a hot topic. By 2015, the mission hopes to make Sikkim a fully organic state, meaning all agricultural products cultivated there would be safe to eat and farmed using organic fertilisers. Cuba will always be remembered as the first country to implement such extensive organic gardening. However, due to a protracted trade blockade with other countries, Cuba was forced to resort to such farming techniques. The State, which willingly switched to organic farming, continues to be a leading democratic example around the globe. The transition to organic farming on the 58,168 hectares of cultivable land began at the ground level in 2010. The three-phase organic certification procedure in Sikkim is being carried out by organisations recognised by

the Agriculture and Processed Food Products Export Development Authority. Organic Sikkimese produce, primarily vegetables, would not only increase the value for Sikkimese farmers but also provide other advantages for the State. The organic status will support Sikkim's ecotourism. Sikkim's tourism industry leaders are certain that the Organic Mission, when combined with ecotourism, will draw visitors in two different directions, especially to homestays. Visitors may take in Sikkim's natural beauty while also improving their health by consuming organic foods. Sikkim ecotourism will only grow in value. In 2003, the year it stopped importing chemical fertilisers into the State, the Government of Sikkim entered the Organic Mission process. Since that time, Sikkim's arable land has been largely organic, and the state's farmers have long used organic manure. The Sikkim government opened its first organic retail store in New Delhi and wants to create others in other significant Indian cities to market its organic goods.

1.6.1 Policy Mission and Vision

- 1) Draft state legislation governing organic farming.
- 2) Create a transparent road plan for organic farming that can be easily followed.
- 3) Use a methodical approach to implement the organic farming programmes to meet the government-set goal.
- 4) To create and investigate markets for organic goods.
- 5) To create connections between organic farmers and the market with the help of certification organisations to maintain the policy indefinitely.
- 6) To create an appropriate logo for the Sikkim organic brand.
- 7) To make agriculture lucrative, sustainable, and ethical.

Table 1: Crop-wise Area, Production and Productivity in Sikkim 2020-21

Crop	Area(000' hectares)	Production (000' tones)	Productivity (kg./ha)
Rice	8.70	16.19	1860.61
Wheat	0.10	0.12	1153.85
Maize	38.39	67.94	1769.68
Finger Millet	2.05	2.13	1037.98
Barley	0.35	0.40	1167.63
Buckwheat	3.11	3.07	986.83
Pulses	5.14	4.95	961.76
Oilseeds	6.13	5.67	925.09

Source: (Report, Area, Production and Productivity in Sikkim, 2022)

Rice

Rice is one of the most important cereal crops of Sikkim grown in all places having warm and humid climates with shallow water.

Table II: Area, Production and Productivity of Rice in Sikkim

	Year	Area(000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	14.74	21.19	1437.00
2.	2004-2005	14.74	21.61	1466.00
3.	2005-2006	14.74	22.69	1539.35
4.	2006-2007	14.15	21.45	1515.90
5.	2007-2008	14.00	22.85	1632.14
6.	2008-2009	13.00	22.23	1709.23
7.	2009-2010	12.27	20.93	1705.79
8.	2010-2011	12.14	20.97	1727.63
9.	2011-2012	12.00	21.08	1757.00
10.	2012-2013	11.92	21.34	1790.27
11.	2013-2014	11.16	20.26	1815.74
12.	2014-2015	11.04	20.18	1828.20
13.	2015-2016	10.67	19.69	1845.25
14.	2016-2017	10.48	19.45	1856.02
15.	2017-2018	9.50	17.64	1856.24
16.	2018-2019	9.26	17.18	1856.29
17.	2019-2020	8.69	16.14	1858.08
18.	2020-2021	8.70	16.19	1860.61

Source: (Report, Area, Production and Productivity in Sikkim, 2022)

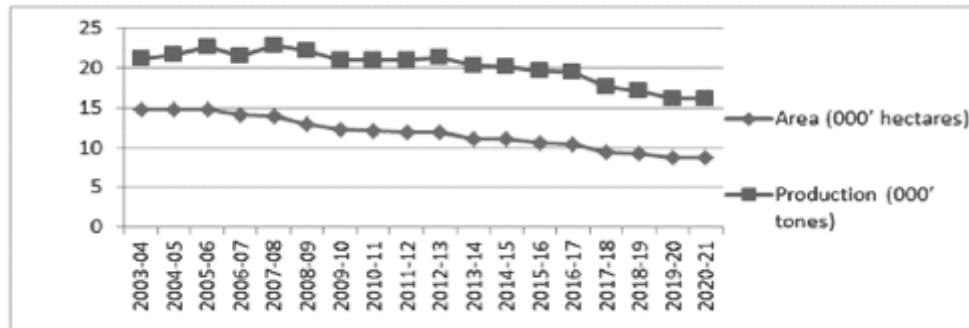


Figure I: Rice: Area and Production

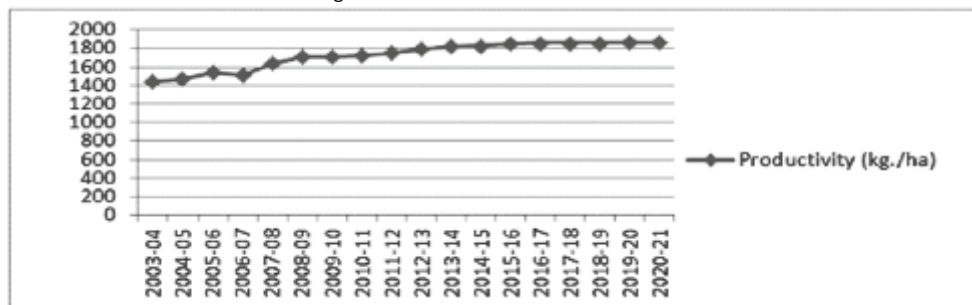


Figure II: Rice Productivity

Sources: (Report, Area, Production and Productivity of Rice in Sikkim., 2022)

Wheat

Wheat is another cereal crop of Sikkim growing in almost all villages of Sikkim having cool winter and hot summer climate, irrespective of elevation and irrigation facilities.

Table-III: Area, Production and Productivity of Wheat in Sikkim

	Year	Area(000' hectares)	Production(000' tones)	Productivity (kg./ha)
1.	2003-2004	5.74	8.09	1410.00
2.	2004-2005	5.74	8.25	143700
3.	2005-2006	5.74	9.20	1602.79
4.	2006-2007	6.38	10.36	1623.82
5.	2007-2008	4.45	4.46	1002.25
6.	2008-2009	3.90	3.50	874.43
7.	2009-2010	5.20	4.72	907.69
8.	2010-2011	2.65	2.71	1022.68
9.	2011-2012	2.50	2.65	1060.00
10.	2012-2013	0.52	0.55	1057.69
11.	2013-2014	0.36	0.38	1069.44
12.	2014-2015	0.39	0.41	1066.80
13.	2015-2016	0.32	0.35	1071.21
14.	2016-2017	0.26	0.29	1079.25
15.	2017-2018	0.17	0.19	1079.26
16.	2018-2019	0.16	0.18	1079.33
17.	2019-2020	0.17	0.18	1081.73
18.	2020-2021	0.10	0.12	1153.85

Sources: (Report, Area, Production and Productivity of Wheat in Sikkim, 2022)

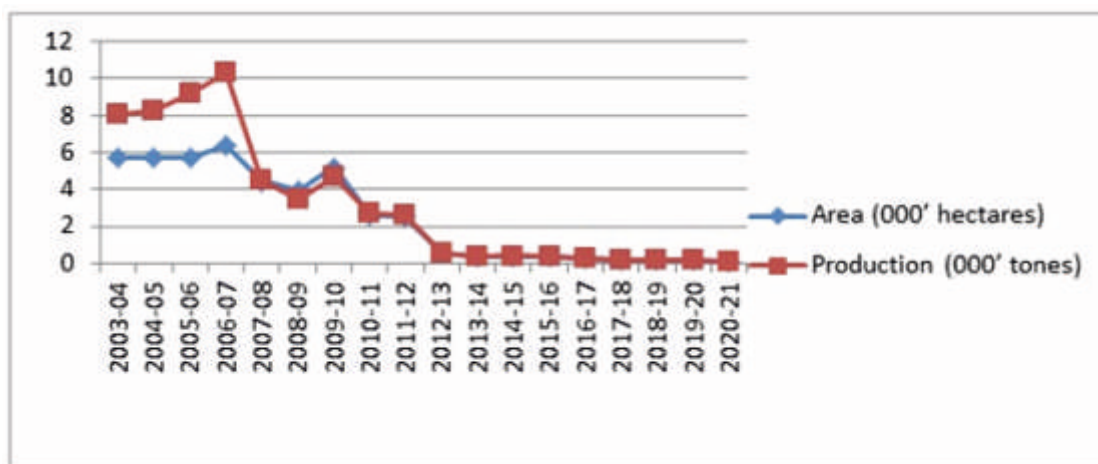


Figure-III: Wheat: Area and Production

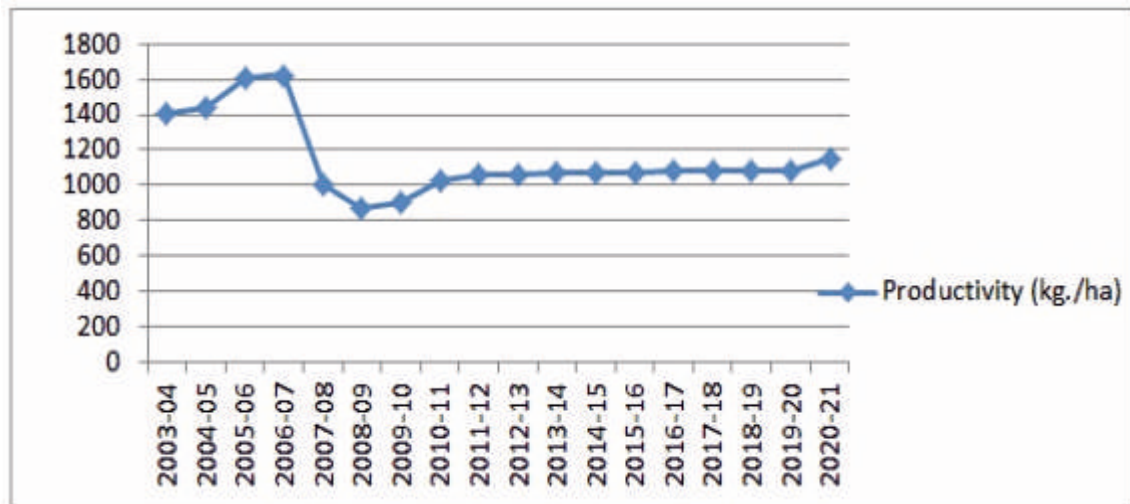


Figure IV: Wheat Productivity

Sources: (Report, Area, Production and Productivity of Wheat in Sikkim., 2022)

Maize

One of Sikkim's most significant cereal crops is maize. It is cultivated across an area of around 36,000–40,000 hectares, or 35–40% of the total cultivable area.

Table IV: Area, Production and Productivity of Maize in Sikkim

	Year	Area (000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	36.70	57.05	1554.50
2.	2004-2005	36.70	58.19	1585.00
3.	2005-2006	36.70	61.10	1664.85
4.	2006-2007	40.85	64.89	1588.49
5.	2007-2008	39.10	62.56	1600.00
6.	2008-2009	39.20	65.74	1677.04
7.	2009-2010	39.50	64.69	1637.72
8.	2010-2011	40.17	66.19	1647.82
9.	2011-2012	40.17	67.52	1680.85
10.	2012-2013	39.97	67.95	1700.03
11.	2013-2014	39.93	68.82	1723.64
12.	2014-2015	38.91	68.82	1768.80
13.	2015-2016	38.96	68.31	1753.56
14.	2016-2017	38.50	67.99	1766.11
15.	2017-2018	38.46	67.97	1767.34
16.	2018-2019	37.78	66.79	1767.93
17.	2019-2020	38.39	67.91	1769.03
18.	2020-2021	38.39	67.94	1769.68

Sources: (Report, Area, Production and Productivity of Maize in Sikkim., 2022)

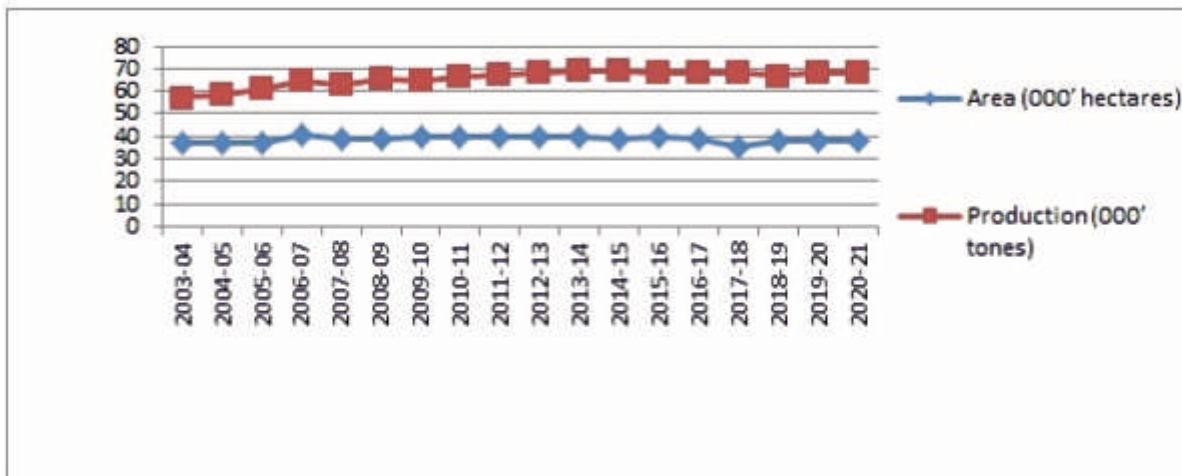


Figure-V: Maize: Area and Production

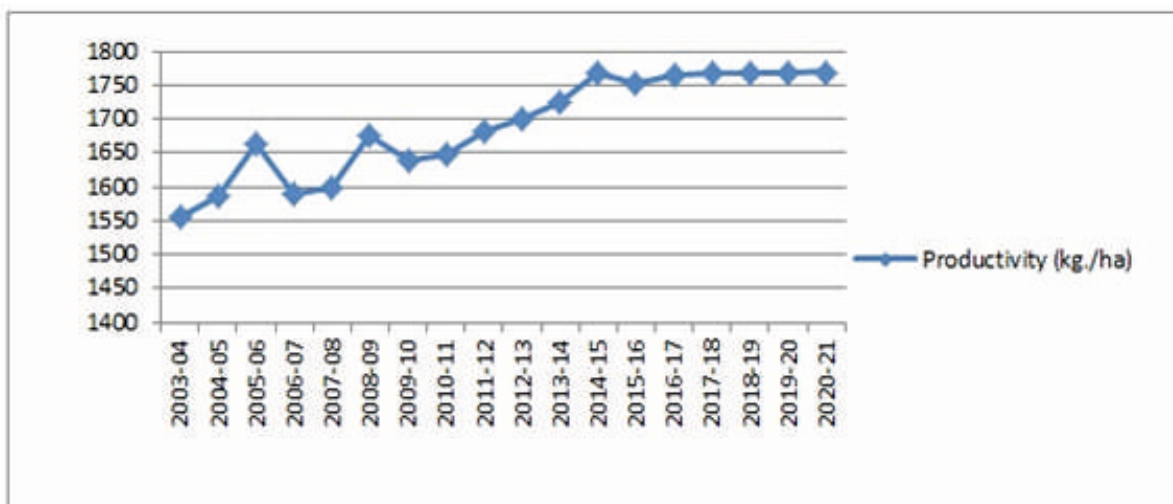


Figure VI: Maize Productivity

(Report, Area, Production and Productivity of Maize in Sikkim., 2022)

Finger Millet

Area, Production and Productivity of Finger Millet in Sikkim.

Table V: Area, Production and Productivity of Finger Millet in Sikkim

	Year	Area (000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	4.15	3.57	860.24
2.	2004-2005	4.15	3.60	867.00
3.	2005-2006	4.15	3.78	910.84
4.	2006-2007	4.14	3.90	942.03
5.	2007-2008	3.76	3.53	938.83
6.	2008-2009	3.76	3.53	940.00
7.	2009-2010	4.25	4.18	983.53
8.	2010-2011	3.00	2.89	964.33

9.	2011-2012	3.50	3.45	985.71
10.	2012-2013	2.98	2.96	993.29
11.	2013-2014	2.96	2.97	1002.03
12.	2014-2015	3.07	3.09	1005.20
13.	2015-2016	2.85	2.91	1020.33
14.	2016-2017	2.61	2.69	1031.46
15.	2017-2018	2.47	2.55	1031.65
16.	2018-2019	2.11	2.18	1031.66
17.	2019-2020	2.28	2.37	1036.89
18.	2020-2021	2.05	2.13	1037.98

Sources: (report, Area, Production and Productivity of Finger Millet in Sikkim., 2022)

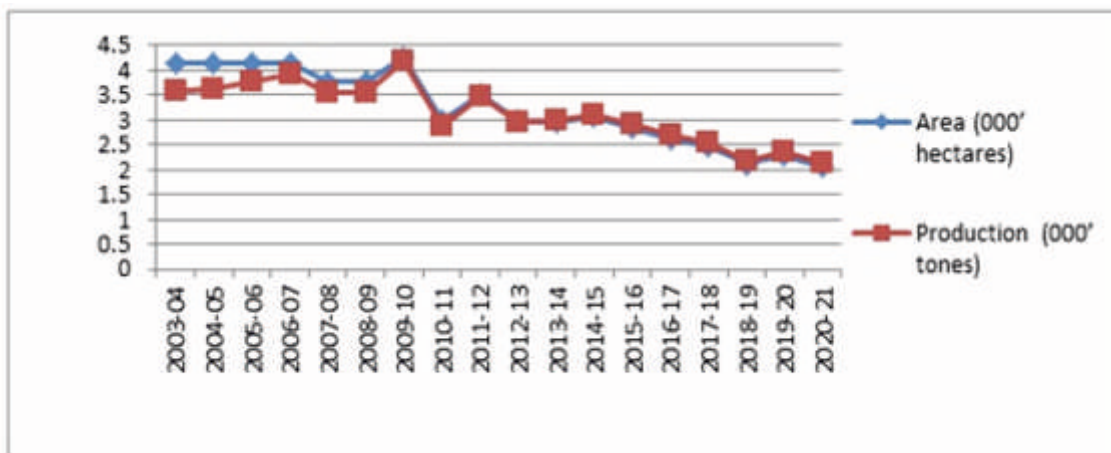


Figure VII: Finger Millet: Area and Production

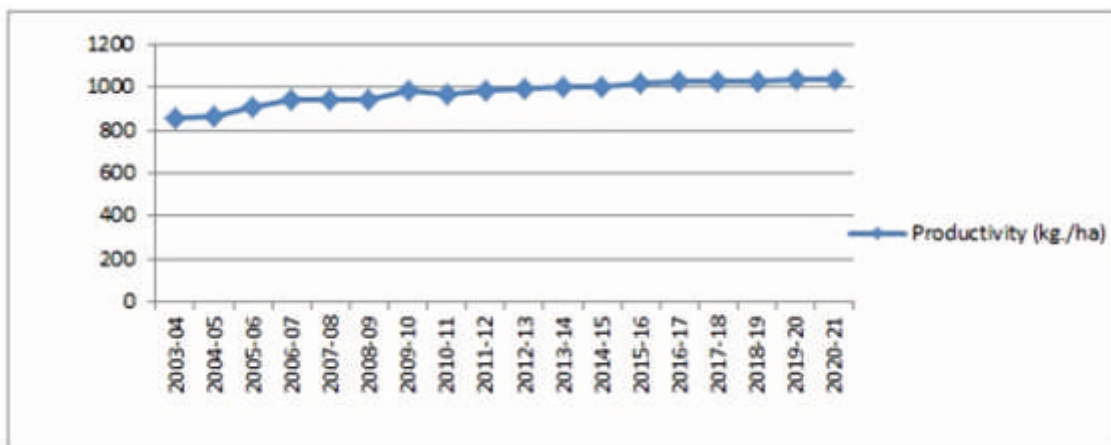


Figure-VIII: Finger Millet: Productivity

Barley

Area, Production and Productivity of Barley in Sikkim

Sikkim's barley is a tiny rabi cereal crop that is grown only in a few isolated locations over an approximate 7881.15-thousand-hectare area. The systematic application of agronomic practises and crop improvement efforts, such as the introduction and acclimatisation of high-yielding cultivars, are both required for the production of barley.

Table VI: Area, Production and Productivity of Barley in Sikkim

	Year	Area(000' hectares)	Production(000' tones)	Productivity(kg./ha)
1.	2003-2004	1.23	1.51	1227.64
2.	2004-2005	1.23	1.52	1235.00
3.	2005-2006	1.23	1.59	1292.68
4.	2006-2007	1.15	1.27	1104.35
5.	2007-2008	0.71	0.66	929.58
6.	2008-2009	0.50	0.47	930.00
7.	2009-2010	1.00	0.92	920.00
8.	2010-2011	0.64	0.61	951.09
9.	2011-2012	0.65	0.63	965.52
10.	2012-2013	0.59	0.59	1000.00
11.	2013-2014	0.58	0.59	1020.69
12.	2014-2015	0.57	0.60	1052.60
13.	2015-2016	0.45	0.47	1055.93
14.	2016-2017	0.45	0.48	1061.81
15.	2017-2018	0.42	0.45	1072.64
16.	2018-2019	0.79	0.84	1072.69
17.	2019-2020	0.40	0.46	1150.83
18.	2020-2021	0.35	0.40	1167.63

Sources: (Report, Area, Production and Productivity of Barley in Sikkim., 2022)

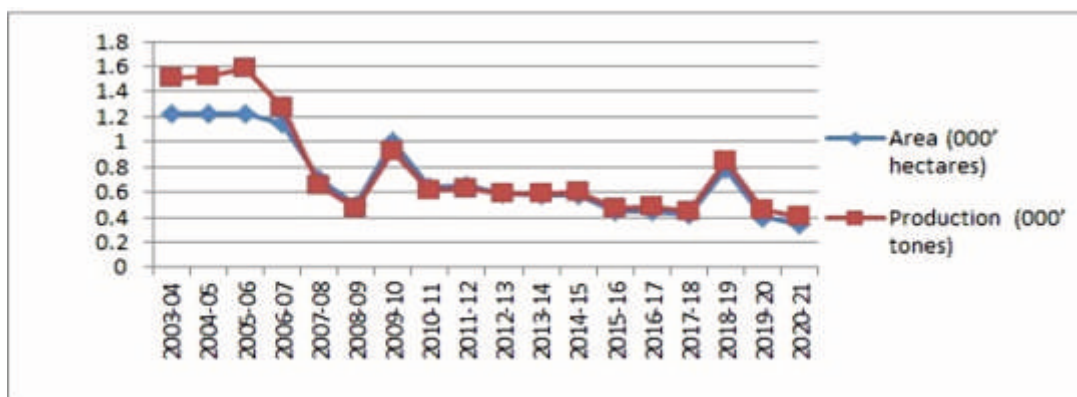


Figure-IX: Barley: Area and Production

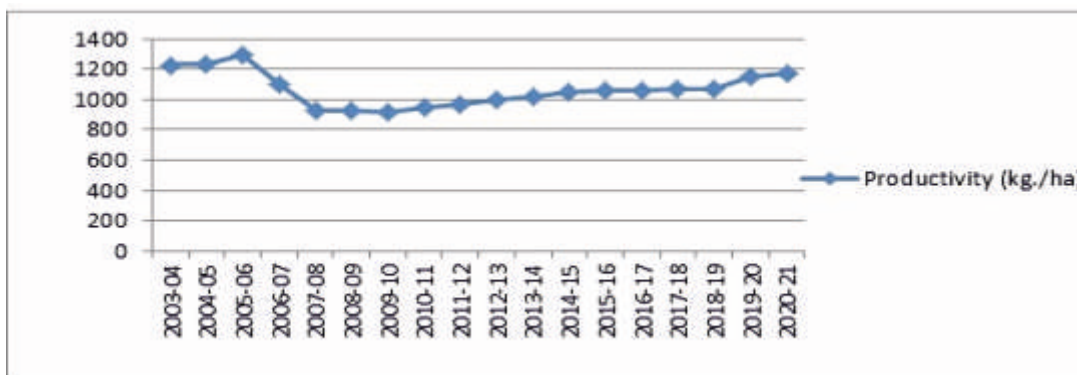


Figure-X: Barley Productivity

Sources: (Report, Area, Production and Productivity of Barley in Sikkim., 2022)

Buckwheat

Area, Production and Productivity of Buckwheat in Sikkim

Table VII: Area, Production and Productivity of Buckwheat in Sikkim

	Year	Area(000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	2.01	1.55	771.14
2.	2004-2005	2.01	1.56	776.00
3.	2005-2006	2.01	1.64	815.92
4.	2006-2007	2.04	1.79	877.45
5.	2007-2008	2.04	1.79	877.45
6.	2008-2009	5.54	5.35	965.52
7.	2009-2010	5.54	5.07	915.16
8.	2010-2011	4.39	4.06	924.03
9.	2011-2012	5.00	4.72	945.00
10.	2012-2013	3.56	3.38	949.44
11.	2013-2014	3.63	3.49	961.57
12.	2014-2015	3.27	3.16	961.58
13.	2015-2016	3.57	3.47	972.27
14.	2016-2017	3.57	3.48	974.79
15.	2017-2018	3.43	3.35	976.24
16.	2018-2019	3.00	2.94	982.50
17.	2019-2020	3.14	3.09	984.72
18.	2020-2021	3.11	3.07	986.83

Sources: (Report, Area, Production and Productivity of Buckwheat in Sikkim., 2022)

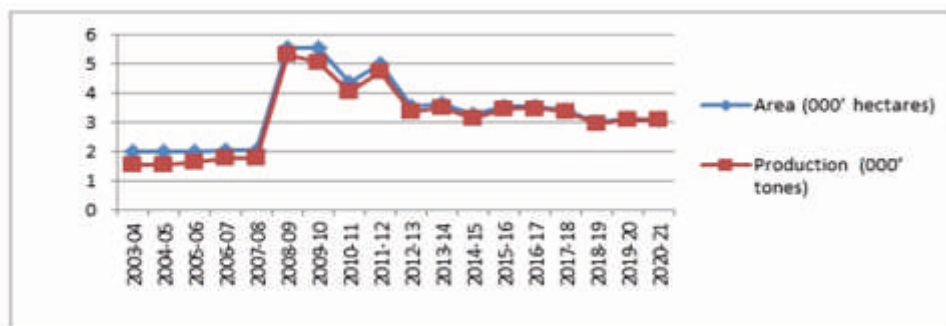


Figure-XI: Buckwheat: Area and Production

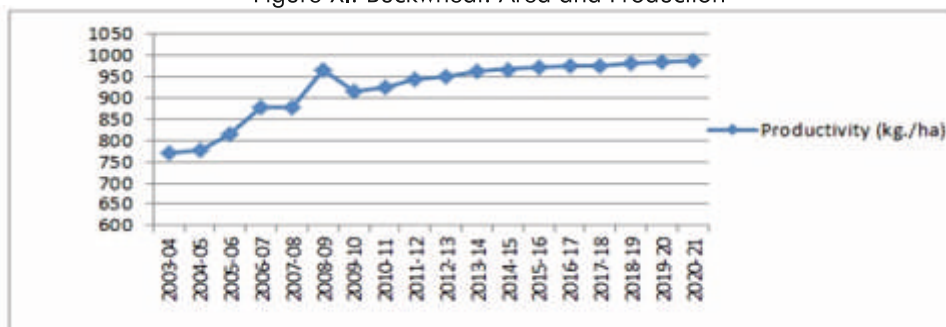


Figure-XII: Buckwheat: Productivity

Source: (Report, Area, Production and Productivity of Buckwheat in Sikkim., 2022)

Pulses

Area, Production and Productivity of Pulses in Sikkim

Table VIII: Area, Production and Productivity of Pulses in Sikkim

	Year	Area (000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	6.71	6.38	950.82
2.	2004-2005	6.71	6.44	950.82
3.	2005-2006	6.80	6.76	994.12
4.	2006-2007	5.96	5.45	914.44
5.	2007-2008	6.06	5.89	971.95
6.	2008-2009	5.88	5.79	984.69
7.	2009-2010	6.50	6.06	932.31
8.	2010-2011	6.70	5.97	922.30
9.	2011-2012	6.78	6.11	901.18
10.	2012-2013	6.37	5.83	915.23
11.	2013-2014	6.30	5.83	926.03
12.	2014-2015	6.02	5.60	929.79
13.	2015-2016	5.67	5.38	948.85
14.	2016-2017	5.43	5.18	953.22
15.	2017-2018	5.35	5.10	954.21
16.	2018-2019	5.00	4.81	960.88
17.	2019-2020	5.24	5.04	961.76
18.	2020-2021	5.14	4.95	963.81

Sources: (report, Area, Production and Productivity of Pulses in Sikkim., 2022)

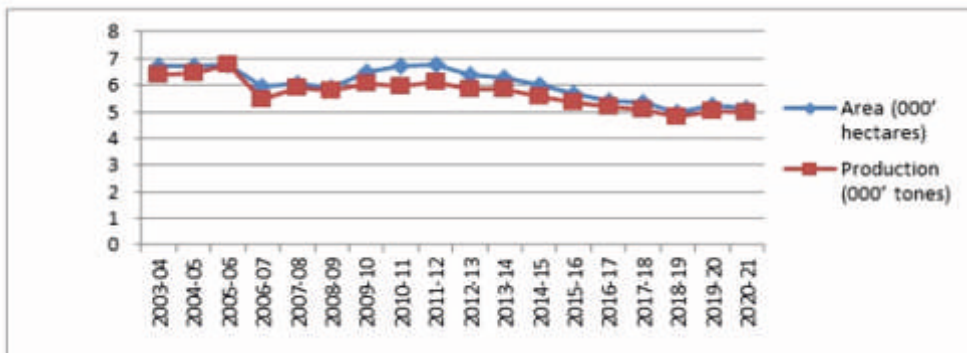


Figure-XIII: Pulses: Area and Production

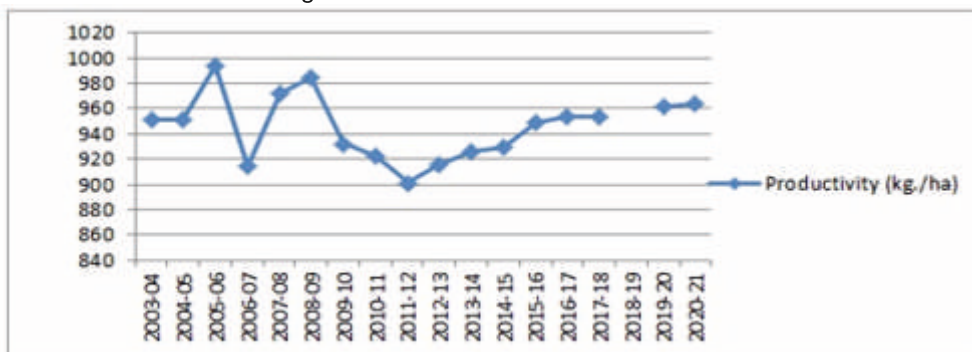


Figure-XIV: Pulses: Productivity

Source: (report, Area, Production and Productivity of Pulses in Sikkim., 2022)

Oil Seeds

Area, Production and Productivity of Oilseeds in Sikkim

Table IX: Area, Production and Productivity of Oilseeds in Sikkim

	Year	Area (000' hectares)	Production (000' tones)	Productivity (kg./ha)
1.	2003-2004	9.95	7.44	747.74
2.	2004-2005	9.95	7.56	770.00
3.	2005-2006	9.95	7.95	798.99
4.	2006-2007	8.97	7.29	812.71
5.	2007-2008	8.60	7.47	868.60
6.	2008-2009	8.90	7.61	855.05
7.	2009-2010	10.00	8.20	820.00
8.	2010-2011	9.46	7.91	836.35
9.	2011-2012	9.50	8.11	853.68
10.	2012-2013	8.24	7.11	862.86
11.	2013-2014	7.95	7.06	887.67
12.	2014-2015	7.66	6.88	897.78
13.	2015-2016	6.94	6.31	909.75
14.	2016-2017	6.73	6.20	922.26
15.	2017-2018	6.28	5.80	924.55
16.	2018-2019	6.07	5.61	924.60
17.	2019-2020	6.06	5.61	924.70
18.	2020-2021	6.13	5.67	925.09

Sources: (Report, Area, Production and Productivity of Oilseeds in Sikkim., 2022)

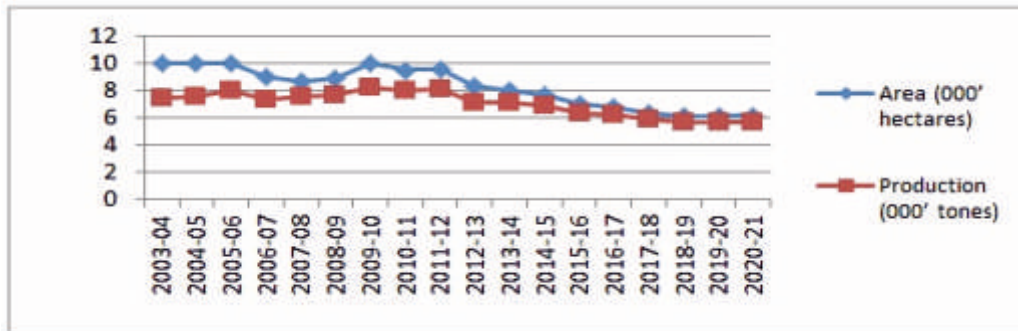


Figure-XV: Oilseeds: Area and Production

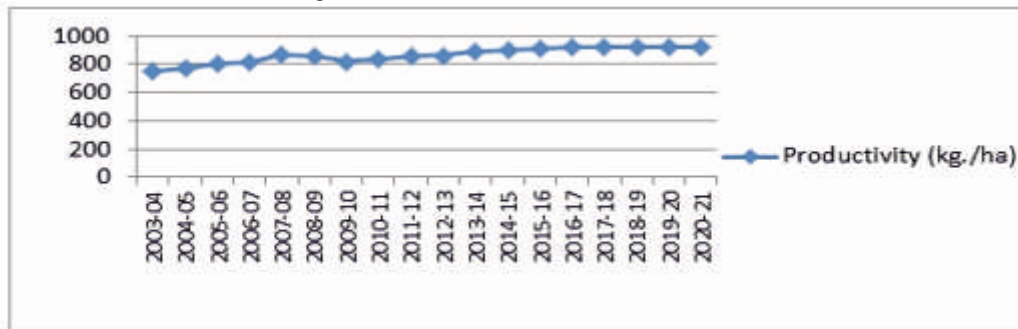


Figure-XVI: Oilseeds: Productivity

Source: (Report, Area, Production and Productivity of Oilseeds in Sikkim., 2022)

2. Literature Review

Muller (2009) highlights the advantages of organic farming as a strategy for developing nations to adapt to and mitigate the effects of climate change. Satish (2012) has investigated the contribution that organic farming makes to the efficient use of resources in food production and to the reduction of pollution. In Contrast Dimitri (2012) claims that higher costs for organic produce are justified because farmers are expected to earn more money and make a profit. However, Singh (2011) has discussed the financial viability of organic farming using the experience of growing wheat in Punjab. K (2013) has conducted research into how the Indian government might help organic farming grow. In the author's view, government intervention in the Indian agricultural sector, especially in organic farming, is crucial for advancing organic agriculture. The growth of organic agriculture can be supported by increasing subsidies and disseminating information about the negative impacts of chemical-based agriculture.

Pandey & Singh (2012) believe that India's rate of organic farming growth is lower than that of other nations. Subrahmanyeswari (2011) found other benefits of organic farming and examined the possibility of using organic farming as a tool for achieving gender equality in India. Kundu (2012) has documented similar findings from her work with women's empowerment and discovered that women's involvement in various socioeconomic activities based on the self-help group model has led to a noticeable improvement in each group's status.

Barik (2017) observed that organic farming functions as an input-output process that mimics nature. As it tries to create goods ranging from edible to organic cotton and fibre, etc., India's organic agricultural industry is currently in a unique position. To combat the technological advance and provide an accessible and improved future for organic farming in India, a case study with the IRF organic package of practices has been carried out.

According to Reddy (2010), this is because organic farming has been largely excluded from the agricultural policy of the country, resulting in less government assistance than in the case of conventional farming.

3. Research Methodology

The Mission Directorate provided secondary information about the mission's progress. Based on a descriptive method of research, this research report was written. The secondary sources are primarily used to gather information. To obtain the broadest knowledge possible on the state and its economy, secondary data sources are explored. The Sikkim Organic Mission (2015), Sikkim: A Statistical Profile: 2002, 2011: Handbook of Organic

Crop production in Sikkim (2014), Village profile of Sikkim, Annual Progress Report 2020-2021 are just a few examples of the secondary sources used to gather general ideas about the demographic, socioeconomic, and environmental information.

4. Challenges in Organic Farming

The biggest obstacles to the development of organic farming in the nation are determined to be the following:

- Low yields,
- An inability to meet export demand,
- A lack of quality standards for bio manures,
- Political and social factors,
- A lack of awareness,
- Problems with output in marketing,
- A shortage of biomass,
- Inadequate supporting infrastructure,
- High input costs,
- Marketing issues with organic input are all factors.
- Inadequate Accounting Procedure

Surprisingly, organic farming has not yet succeeded in breaking into the agricultural mainstream despite advancements in the industry. It's difficult to switch to organic farming practises, and farmers don't always get paid as much for their goods as they should.

- Farmers face many challenges when starting an organic farm. The major obstacles include, among others, the high cost of organic inputs, the necessity of certification, the small market for organic products, the low yield, and the low prices. In addition, there is a modest demand for organic products, a drawback to applying organic methods, a larger risk of production, and a lack of consolidated land suited for organic farming.
- One of the main issues is that as a result of the widespread use of pesticides and other chemicals to manage weeds and insect pests, pest and weed species have evolved. The major problem in converting from conventional farming to organic farming is this (Reddy, 2010).
- Organic farming is supported by the government and adheres to strict standards for plants, animals, wild crafts, and agricultural processing. Before farmers' produce and goods may bear the "organic" label, they must receive certification. The National Organic Standards of the United States Department of Agriculture (USDA) have offered organic agricultural advice since 2000, and there are many licenced organic certifiers across the country.

- For 276 million tonnes of food grain, a very low production was necessary.
- One of the most important difficulties is a lack of marketing.
- To develop organic agriculture, there is no policy to support farmers' motivation.
- Overuse of chemicals to eradicate weeds and pests has resulted in a weed and pest problem.
- Farmers in the transition phase have reduced output due to severe pest infestation and the ban on synthetic pesticides in organic farming.
- Organic products are destroyed since they are usually perishable and lack enough infrastructure and cold storage facilities.
- Lack of organisation and appropriate advice for interested farmers.
- Because of the high labour costs and low yields of organic products, people are dissuaded from purchasing them.
- Unable to meet the demand for exports. Before the organic mission can be successfully implemented, the challenges must first be solved.

5. Prospects of Organic Farming

According to the National Project on Organic Farming Department of Agriculture and Cooperation, Govt of India, India has been a traditional organic country, but with a flood of techniques and pesticides, it was pushed out of society. However there is great demand for organic products in developed countries and other repudiated countries, but in India also there is increasing demand for organic products due to growing awareness about food quality and safety, improving soil health, controlling pest attacks, and accumulating evidence of being equally productive, the organic farming has emerged as an alternative system of farming which not only assure quality and sustainability concerns but also ensures debt free and profitable livelihood option. And many organic farmers believe that India's dry land has a great deal of promise for success with organic farming because the country's marginal terrain is best suited for low-input farming systems that make use of biodiversity rather than intensive farming methods. As a result, organic farming, with its emphasis on preserving and enhancing soil health, avoidance of pollutants, and dependence on locally available resources and labour, can significantly improve the economic and ecological health of the dry lands as well as the well-being of the inhabitants. The biggest obstacle to the development of organic farming is the government's unwillingness to make a strong decision to support organic agriculture. Unless such an unambiguous

direction is available in terms of both financial and technical support, from the Centre to the Panchayat levels, mere regulation-making will amount to nothing.

- Improves agro-biodiversity (both of the varieties and crops) conservation and environmental protection in long run.
- Thus, putting more of a focus on bio-fertilizers, organic manures, and insecticides helps to lessen dependence on outside inputs to some level.
- Only 11% of the world's land area is used for agriculture. However, the other 89% of the earth's surface had not been impacted by the use of pesticides, fertilisers, or other agrochemicals.
- Based on a rain-fed farming system because there was inadequate irrigation infrastructure and steep terrain, which helped conserve water.
- Sikkim's soil has a 2-7% organic carbon content, indicating a richness in organic matter; as a result, it uses very little chemical fertiliser and pesticides. Even after the progressive adoption of organic farming, the average restricted fertiliser (7 kg/ha) and insignificant pesticide use before 2003 have no negative effects on production per hectare.
- It is simple to transition the 10,000 ha of land used for large-scale cardamom¹ cultivation that uses no fertiliser to organic farming.
- For the benefit of future generations, organic farming improves and safeguards traditional knowledge of farming, agricultural processing, and new seed development.

6. Findings

The issues that Sikkim's farmers are dealing with, along with the difficulties that the Sikkim Government is facing, make it difficult for organic farming to reach its full potential.

1. **Reduced Agriculture Production:** In the state, a loss in yield is the main issue with organic farming. Since chemical-based pesticides have been permanently banned, crop diseases that were formerly simple to control have emerged. Similar to how there are no high-yielding crops now that chemical fertilisers are prohibited. Due to the development of crop diseases and pest infestations that organic methods cannot control, farmers are thus faced with low yields of products, to begin with, and even those are diminished.
2. **Distribution System:** Both conventional and organic agriculture suffers from an ineffective distribution channel with an excessive number of middlemen. The middlemen drive up the cost of distribution, so even

though organic produce may cost Rs. 50 when it is delivered to the final consumer, the farmer may only receive Rs. The middlemen are likewise inappropriate for a completely organic state because they do not target certain niches and are simply interested in increasing their earnings. Therefore, it makes little difference to them whether the produce they sell was grown organically or using farming techniques that rely on chemicals. They cause harm to the entire organic product distribution network.

3. Organic farming and development are positively related because Sikkim's rural area and level of living have improved. Increased exports of organic goods from Indian marketplaces are bringing in more foreign currency, which promotes national prosperity in all areas, including health and sanitation. Even if organic farming is becoming more popular and more people are becoming aware of it, there are still obstacles that make it easier for farmers to use conventional methods and more expensive for consumers to buy organic products.
4. In Sikkim, organic farming was practised on 8 lakh 35 000 hectares of land, helping 4 lakh farmers. About 2.5 thousand farmer interest groups were established, and via them, about 45 thousand farmers were connected to the organic programme. The goal was to cover 50,000 hectares of land. Land Certification: There are two different organic certification processes in India: Participatory Guarantee System (PGS), which is exclusively intended for local sales, and Third-Party Certification, which is required for exports. PGS entails essentially no expense, but Third-Party Certification is an expensive endeavour, particularly for a single farmer. For third-party certification, Sikkim spent an average of Rs. 8,400 per ha over the course of three years, and it now anticipates paying roughly Rs. 1,425 ha per year for renewal. This indicates that the cost of renewal over the course of three years will be slightly higher than the cost of conversion. SOM spent roughly Rs. 77 crores between 2010 and March 2016, of which about Rs. 60 crores, or 78%, was used for certification and related procedures. Such a high cost of certifications is unsustainable in the long-term and impractical as it deters the government from allocating the budget to more important activities such as training the farmers in the latest methods of organic farming and providing them with effective organic pesticides and manure to increase the yield.
5. The current study has made progress in that direction by outlining potential solutions to the problems, To routinely analyse the situation, and suggesting

mitigating measures that will benefit the government, the farmers, the environment, and, most importantly, India, more research into the state of organic Sikkim is required.

6. Sikkim becomes the first state in the world to be entirely organic. Its entire farmland is organically certified. More than 66,000 farming households that grow organically and sustainably on more than 76,000 acres of land have benefited from the shift. Chemical fertilisers and pesticides were gradually phased out as a result of the strategy, which also led to a complete ban on their usage and sale in the state.
7. Additionally, there is a need for processing and value addition, which will improve value realisation and local employment. there is a need for crop diversification and the introduction of other crops. Farmers may find that multi-cropping reduces risk. Banks, farmers, farmer organisations, and government agencies must all be included in the decision-making process. Other State Governments that are interested in becoming organic States could learn a lot from Sikkim.

7. Conclusion

According to the report, farmers are satisfied with the State Government's choice. However, there is a need for forward integration (particularly selling Backward integration as well as premium organic produce pricing from outside the State (for the supply of organic manures and bio-pesticides). Additionally, there is a need for processing and value addition, which will improve value realisation and local employment. Additionally, there is a need for crop diversification and the introduction of other crops. Farmers may find that multi-cropping reduces risk. Banks, farmers, farmer organisations, and government agencies must all be included in the decision-making process. Other State Governments that are interested in becoming organic States could learn a lot from Sikkim. The only practical alternative that has emerged is organic farming. Against this backdrop, Sikkim's story is highlighted since it has the guts to be the only state in the union to grow all of its crops organically. We all hope that this programme will be a success since it will pave the way for further organic agricultural innovation, but there are several problems with the Sikkim model that need to be addressed right away to keep them from growing out of control. Further investigation into the state of organic Sikkim is required to continuously evaluate the situation and offer mitigating actions that will help the government, farmers, the environment, and, most importantly, India. Through the citation of prospective answers to the problems, the current study has made a step in that direction.

8. Recommendation and Suggestions

For Farmers

- Farmers require encouragement to cultivate various crops and market them for greater value realisation.
- There is good scope for increasing the area and productivity of buckwheat.
- To expand the area devoted to particular crops, seed communities must be encouraged. This might enhance the quality of seed stock.
- The State Government may designate a separate area in each local market for the sale of organic locally produced goods as well as inorganic goods from outside the area.

For State Government

- Vegetable cultivation is a dangerous endeavor without guaranteed irrigation. In the areas designated for vegetable cultivation, adequate irrigation facilities must be provided (either through diversion channels, drip irrigation schemes, or lift irrigation schemes). This is the issue that all farmers have raised.
- The introduction of native crops (such as buckwheat, millet, etc.) will benefit local farmers as well as the community's consumers.
- Organic foods and Sikkim produce should also be made more well-known through advertising in the tourism industry.
- To ensure that farmers have access to the necessary supply of inputs, the State Government should invite private organic manure and bio-pesticide producers to the State (on a commercial basis).
- There is a need to popularise Sikkim Organic Produce among tourists, both within and outside the State.

For Marketer

- Encouragement of the local community's use of agricultural products is necessary to cut down on spending on imported foods.
- During the harvest season, the State Government may acquire the produce (such as ginger, turmeric, etc.) and later sell it at auction to foreign bidders.
- To market organic Sikkim produce outside of the State, SIMFED may open additional stores. Support for the collection, gathering, and transportation of organic produce from villages may be made available to SIMFED.

For Government Agencies

- In the first three years of conversion in organic farming, the yield often declines. Later, the yields

might not stabilise if nutrients are not added back to the soil. There is a compelling argument in favour of widely implementing organic manures (both local and non-local sources).

- Large-scale encouragement is needed for dairy and other livestock. This will deal with the issue of manures and provide farmers with additional money.
- In rural locations, toilet problems exist. Making toilets with plastic bio-gas units available could aid in a recycling plant, animal, and human waste.
- The responsible organisations (KVK, Agriculture and Horticulture Depts.) should use organic methods that have been approved to combat disease and insect issues. The organic bio-pesticides ought to be distributed in groups.

For Storage Producing Value addition

- Cold storage facilities need to be built at the block level so that farmers or food aggregators can keep their products for a while.
- To reduce losses, rural go-downs are also necessary for storing food grains (such as buckwheat, maize, etc.).
- It may be suggested to farmers, JLGs, and SHGs to engage in primary processing, such as washing, grading, and packing. Infrastructure might be built by the state government, and it could be maintained by the interested group for a minimal fee from farmers.

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