Identify Potential sourcing areas of selected organic fruits and vegetables (mango, onion, Pomegranate) in Maharashtra and Andhra Pradesh.

Comment [Z1]: The title is good (18 words)

ABSTRACT

India, characterized as an agricultural nation, witnesses approximately 54.6 percent of its population relying on agriculture and allied sectors, contributing 17.8 percent to its gross value in the fiscal year 2019-2020. Its diverse climate and immense fruit and vegetable cultivation potential distinguished it. Organic agriculture is being practiced in 187 countries globally, where a massive area of about 72.3 million hectares of agricultural land is managed by more than 3.1 million farmers (Statista, 2023). Organic farming is currently in its early stages in India. As per the FIBL & IFOAM Year Book 2020, India secures the 5th position globally. Based on the prominence of cultivation of selected organic fruits and vegetables, i.e., onion, mango, and Pomegranate, two districts from Andhra Pradesh, i.e., Chittoor and Kadapa, and two districts from Maharashtra, i.e., Nashik and Solapur it is had been considered for their sourcing. Based on the purposive sampling method, data was collected from 20 respondents for each crop, including 60 respondents of FPOs, traders, and farmers. Among the 60 respondents, 45 belong to the state of Maharashtra and 15 to the state of Andhra Pradesh.

Comment [Z2]: 1.Abstract is good (184 words), maximum abstract of 250 words, it is suggested to add the implications of the research results

2.it is recommended to add keywords, in writing articles there must be a maximum of five words keywords.

Introduction

India is an agricultural country in which around 54.6 percent of the population is dependent on agriculture and allied activities and added 17.8 percent to the country's gross value during the financial year 2019-2020. The diverse climate and the massive potential of India in fruit and vegetable cultivation established it as the second-largest producer of fruits and vegetables after China. India produced 107.10 million metric tonnes of fruits and 204.61 million metric tonnes of vegetables during 2021-22. The area under cultivation of fruits stood at 7.01 million hectares, while vegetables were cultivated in 11.28 million hectares during 2021-2022 (PIB INDIA, 2022). Hence, India is assured of the availability of all varieties of fruits and vegetables as fresh produce. According to the Food and Agriculture Organization (FAO, 2021), India is the largest producer of ginger and okra and ranks second in producing potatoes, onions, cauliflower, brinjal, cabbage, and other vegetables. The country ranks first among fruits producing bananas, mangoes, and papayas. The vast production base offers India tremendous export opportunities. 2021-22, India exported fresh fruits and vegetables worth Rs. 11,412.50 crores/1,527.60 USD million.

The Green Revolution era of the 1960s brought significant changes in Indian agriculture by introducing high-yielding seeds and fertilizers to the farmers to augment food production and achieve food security. But later, the utilization of fertilizers and pesticides increased drastically. This caused severe environmental consequences, such as soil infertility and the production of hazardous food products. Hence, to make farming sustainable, it is necessary to decrease the use of agricultural chemicals.

Organic farming is in a nascent stage in India. According to the FIBL & IFOAM Year Book 2020, India ranks 5th in the World's Organic Agricultural land and 1st in the total number of producers. As of March 31st, 2022, a total area of 9.1 million hectares (registered under NPOP) was under the organic certification process, including 4.7 million hectares of cultivable land and 4.3 million hectares for wild harvest collection. A few states have taken the lead in improving organic farming coverage. As a result, a significant part of the organic cultivated area is concentrated only in a handful of states. Madhya Pradesh has the largest area under organic certification, followed by Maharashtra, Gujarat, Rajasthan, Odisha, Karnataka, Uttarakhand, Sikkim, Chhattisgarh, Uttar Pradesh, and Jharkhand. Sikkim has converted its entire cultivable land (more than 75,000 hectares) under organic certification. Madhya Pradesh contains 0.76 million ha of area under organic cultivation, which is over 27 percent of India's total organic cultivation area, and it is followed by Rajasthan and Maharashtra, which together account for about half the area under organic cultivation. The top 10 states account for about 80 percent of the total area under organic cultivation. The APEDA, Ministry of Commerce & Industries, Government of India is implementing the National Programme for Organic Production (NPOP). The program involves the accreditation of Certification Bodies, standards for organic production, promotion of organic farming and marketing, etc.

Organic farming scenario in Andhra Pradesh

In the current scenario, organic farming is gaining colossal prominence, and Andhra Pradesh, with its massive potential for fruit and vegetable cultivation, is no exception to this trend. The state government has implemented various initiatives and programs to facilitate the transition to organic farming. One of the key initiatives is the "Andhra Pradesh State Organic Farming Policy," which provides a roadmap and framework for developing organic farming practices. The policy promotes organic farming across all agricultural sectors, including crops, horticulture, livestock, and fisheries. The government has also established the "Andhra Pradesh Organic Certification Authority" (APCO), certifying organic produce. This certification ensures that organic farmers follow the required standards and guidelines for organic farming practices. It also helps build consumer trust and provides market access for organic farmers.

Organic farming scenario in Maharashtra

Maharashtra has witnessed significant growth and development in organic farming in recent years. It is one of the leading states in India for organic agriculture practices. The state government has actively promoted and supported organic farming through various initiatives and policies. At the same time, Maharashtra's diverse agro-climatic conditions provide suitable environments for cultivating a wide range of organic crops, including cereals, pulses, fruits, vegetables, spices, and medicinal plants grown using organic methods across the state. Several organizations and farmer groups in Maharashtra have embraced organic farming, transitioning from conventional farming practices to more sustainable and environmentally friendly approaches. These farmers adhere to organic principles, such as avoiding synthetic pesticides, Genetically Modified Organisms (GMOs), and chemical fertilizers. Adopting organic farming practices has contributed to the conservation of soil health and enhanced the quality of agricultural produce. Organic farmers in Maharashtra have reported improved soil fertility, increased water retention, and decreased soil erosion, leading to sustainable and long-term benefits for the farming community. The Maharashtra government has introduced schemes and incentives to support organic farmers, such as financial assistance for certification, training programs, and establishing organic markets. These measures aim to encourage more farmers to switch to organic farming and ensure a fair market for their produce.

Comment [Z3]: Introduction is good

Methodology

To carry out the study with the above objectives in Maharashtra and Andhra Pradesh states, Chittoor, Kadapa, Nashik, and Solapur districts was taken up as study area as most of the select organic fruits and vegetables, i.e., onion, mango, and Pomegranate are cultivated in this district. To collect the primary data regarding select organic fruits and vegetables. Data was collected from 60 respondents, including FPOs, traders, and farmers in the Chittoor and Kadapa districts of Andhra Pradesh and Nashik and Solapur districts of Maharashtra. For each selected organic crop, data was collected from 20 respondents. The purposive sampling method has been used to select the sample.

Comment [Z4]: Methodology is good, but recommended to add 1-2 references

Significant Findings of the Study

Comment [Z5]: 1.Suggested previously added subtitles: Results and Discussion
2. The result is good, but the discussion is still lacking and it is recommended to add 2-3 references for each sub-discussion

The survey was conducted to identify the potential areas for sourcing select organic fruits and vegetables: onion, mango, and Pomegranate from the Andhra Pradesh and Maharashtra states. The data collected has been analyzed to determine the firm's supply sources. The survey shows that the organic cultivation of the selected crops, i.e., onion, mango, and Pomegranate, was prominent and spread across the states of Maharashtra and Andhra Pradesh. In contrast, the cultivation of organic onion is seen in Maharashtra. The presence of several Non-governmental Organizations (NGOs) (such as the Centre for Sustainable Agriculture (CSA) and Deccan Development Society (DDS)) are promoting the cultivation of organic crops in these states. The technical support and scientific advice provided by these agencies are aiding farmers and can result in the further expansion of organic cultivation in these areas. Based on the secondary data collected from various sources such as Ministry of Agriculture GOI, Agriculture Processing and Export Development Authority (APEDA), Farmers Producers Organization (FPO), FPO Junction, National Project on Organic Farming (NPOF), Deccan Development Society (DDS) and Centre for Sustainable Agriculture (CSA) two districts from each state i.e., Solapur and Nashik from Maharashtra and YSR Kadapa and Chittoor from Andhra Pradesh have been identified as potential areas for sourcing of organic Onion, Mango and Pomegranate.

From the secondary data collected from various sources, the potential sources could be FPOs, traders, and farmers. From the available data, 150 FPOs/traders/farmers who are into cultivating either onion, Pomegranate, or mango were contacted. Keeping the basic requirements as possessing organic certification, 60 sample respondents have been shortlisted to conduct the study. Among the 60 respondents, 45 belong to the state of Maharashtra and 15 to the state of Andhra Pradesh. The distribution of the sample respondents is shown in table 1

Table 1 Distribution of samples Respondents

S. No	State	Samples respondent	Percentage of total sample (%)	FPOs	Traders	Farmers
1	Maharashtra	45	75	21 (35%)	15 (25%)	9 (15%)
2	Andhra Pradesh	15	25	8 (13.3%)	4 (6.6%)	3 (5%)
3	**Total**	**60**	**100**	**29**	**19**	**12**

Among the total sample respondents from Maharashtra, 45, 21 were FPOs, 15 were traders, and nine were farmers, whereas in Andhra Pradesh, in the total sample size of 15 respondents, eight were FPOs, four were traders, three were farmers.

Details of Sources for Procuring Organic Onions

The FPOs, traders, and farmers of the Nashik district of Maharashtra are identified as the potential sources for procuring organic onion: nine FPOs, seven traders, and four farmers. All the identified FPOs have Participatory Guaranty System (PGS)-India (organic certification) from the Ministry of Agriculture, Govt. of India.

Details of Sources for Procuring Organic Mangoes

The FPOs, traders, and farmers of Kadapa and Chittoor districts of Andhra Pradesh and Nashik district of Maharashtra are identified as the potential sources for procuring organic mangoes, which include two FPOs, two traders and one farmer from Nashik district and eight FPOs, four traders and three farmers from Andhra Pradesh. All the identified FPOs have Participatory Guaranty System (PGS)-India (organic certification) from the Ministry of Agriculture, Govt. of India.

Details of Sources for procuring organic Pomegranate

The FPOs, traders, and farmers of Solapur and Nashik district of Maharashtra are identified as the potential sources for procuring organic Pomegranate which are seven FPOs, four traders and two farmers from Solapur district and three FPOs, two traders and two farmers from Nashik district. All the identified FPOs have Participatory Guaranty System (PGS)-India (organic certification) from the Ministry of Agriculture, Govt. of India.

References

Abhilash, P. C and Singh, N. 2009. Pesticide use and application: an Indian scenario. *Journal of Hazardous Materials*. 165(1-3): 1-12.

Comment [Z6]: It is recommended to add a conclusion

Comment [Z7]: References are recommended methodology add add 1-2 references and discussion add 2-3 references. And the minimum number is 15 references. Sufficient and up-to-date references and recommended that reference citations use Mendeley IEEE or APA.

Aktar, M. W., Sengupta, D and Chowdhury, A. 2009. Impact of pesticides use in agriculture: their benefits and hazards. *Interdisciplinary Toxicology*. 2(1): 1-12.

Agricultural and Processed Food Products Export Development Authority (APEDA). *Fresh fruits and vegetables*. 2022. https://apeda.gov.in/apedawebsite.

Food and Agriculture Organization (FAO). *Pesticides use, pesticides trade and pesticides indicators – Global, regional and country trends, 1990–2020*. 2022. https://www.fao.org/faostat/en/#data/RT

Press Information Bureau, 2022. *2nd advanced estimates of Fruits and vegetable production*. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1841480.

Statista, 2023. *Global pesticide use by country*. https://www.statista.com/statistics/global-pesticide-use-by-country.

United States Environmental Protection Agency. 2004. Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs, US Environmental Protection Agency: Endangered and Threatened Species Effects Determinations. Collingdale, PA: DIANE Pub.