"Let Food be thy Medicine and Medicine be thy Food" …….... Hippocrates

CHAPTER TWO
REVIEW OF LITERATURE

2.1 Introduction:

This chapter deals with a review of literature published in the value chain of the organic food sector. In addition, studies specifically conducted on the value chain of organic pineapple, organic pumpkin, organic red rice, organic non-basmati rice, and organic turmeric are reviewed. Co-occurrence analysis with VOS viewer software is used to map the keywords of selected articles considered for the study. As COVID-19 has a severe impact on the agri-food supply chain, this study also reviews various literature published during the pandemic to know the direction and theme of the research. To get an overview of the general understanding of the value chain, this chapter also reviewed publications on the value chain analysis of various agricultural commodities in India and Northeast India.

2.1.1 Value Chain

The value chain includes the entire range of activities required to bring a product from the initial input-supply stage, through various phases of production to its final market destination. As per the definition of the Food and Agriculture Organization of the United Nations (FAO), a value chain can be defined as the "full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use" (Hellin & Meijer, 2006). According to Kaplinsky & Morris (2001), "Value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use".

A value chain provides the possibility to access the efficiency of the value-added operations/services and to provide competitiveness to the supply chain through value addition to boost the output, trade, and income of farmers and other actors (Chagomoka et al., 2013); (Kaplinsky & Morris, 2001). The study by Tamasese (2009b), discussed the concept of "Diamond numbers," which are used to identify steps in the chain, and each diamond number breaks the value chain in the logical process or business unit. Six decision diamonds in the

chain are input supplier, farm production, post-harvest treatment, logistics, processing, and lastly, marketing. The study by Bidogeza et al.(2016), revealed that most vegetable value chains consist of five main groups: producers, transporters, traders, processors, exporters, and input suppliers which are the sixth category in the same chain. The study by Karim & Biswas (2016) classified the activities of farmers to consumers into three categories: the value-added activities, the non-value-added activities, and the necessary non-value-added activities. The value-added activities include those activities for which customers are willing to pay for it like production, cleaning, processing, and packaging. Non-value-added activities are done by various intermediaries like commission agents, wholesalers, and retailers for holding and stocking crops for a long time by using chemicals, which also includes loading and unloading. These activities will not lead to any value addition, however, the same increases the handling and quality costs. Necessary non-value-added activities include weighting, transportation, and receiving. These are not related to production or value-added activities, but these activities are necessary and unavoidable in a value chain. The contribution of value-adding activities in the total value chain is less as compared to the other two. The definition of value chain according to (World Bank 2010, ILO 2009. GTZ 2008, IIED 2008, FAO 2007. USAID, UNIDO 2011. CIAT 2007) as cited in (Donovan et al., 2015a) can broadly be classified into three groups:

- *Value chain as a set of activities*: The World Bank (2010) defines a value chain as a"The term value chain describes the full range of value-adding activities required to bring a product or service through different phases of production, including procurement of raw materials and other inputs". The same or similar definitions are offered by the ILO (2009), GTZ (2008), IIED (2008), FAO (2007), and USAID (n.d.).
- *Value chain as a set of actors*: CIP defines a value chain as "All the actors, and the entirety of their productive activities, involved in the process of adding value to a specific crop or products". According to UNIDO (2011), the value chain is defined as "Actors connected along a chain producing, transforming, and bringing goods and services to end --consumers through a sequenced set of activities".
- *Value chain as a strategic network*: According to CIAT (2007), as cited by defines a value chain as "A strategic network among a number of independent business organizations, where network members engage in extensive collaboration".

The "Handbook for Value Chain Research" by Kaplinsky & Morris (2001) categorized value chain as:

- *Simple value chain*: The value chain describes the range of activities that are required to bring a product or service from conception to end users through a series of physical transformations in various stages.
- *The extended value chain:* The extended value chain has more links and connections among various actors involved in the chain from input sellers to global customers and recycling.
- *One or many value chains:* In one or more value chains, intermediary producers in a particular value chain may have or feed into several different value chains.

2.1.2 Value Chain Analysis

Value chain analysis is the process of breaking the chain into its constituent parts, to better understand its structure and functioning (UNIDO, 2009). It consists of identifying various chain actors, functions and relationships among chain actors, governance structure, identifying value-added activities, and computing the cost of value addition in each stage.

2.1.3 Value Chain Models

Various value chain models as reviewed by (Donovan et al., 2015) are presented in the below table.

Table 6: ***Showing11 Value Chain Models by Technical Centre for Agricultural and Rural Cooperation (CTA).***

Methodological Guidelines	**Contribution to Value Chain Development**
Participatory Market Chain Approach, (CIP 2006)	Build the framework for understanding value chain actors and the potential to achieve innovation by building human and social capital.
Participatory market chain analysis for smallholder producers, (CIAT 2007)	It provides the most extensive coverage on service provision and gives guidance to access the service quantity and identify the unfulfilled demand for services.
Guidelines for rapid appraisals of agri-food chain performance in developing countries, (FAO 2007)	Discuss the model of Sustainable Value Chain Development, which assesses the impact of the value chain against three major dimensions: economic, social, and environmental. This model is useful in building strategies for value chain development and helps to assess the performance of actors.
The operational guide for the making markets work for the poor (M4P) approach, (DFID 2008)	It includes calculating the cost, investment returns, and income/ employment distribution. Focus on the participation of farmers in the market through a market system development approach and identify options for more sustainable and pro-poor outcomes.

Table 6 (Continued)	
Value Links manual, (GTZ 2008)	Discuss the four dimensions of value chain selection: Economic, Social, Environmental, and Institutional. It covers a range of important issues affecting VCD, including value chain mapping, value chain implementation, assessment of the business environment and facilitating services, and monitoring and evaluating VCD-related interventions.
Chain-wide learning for inclusive agri-food market development, (IIED 2008).	Discuss the strategies to build a value chain in the national market. Provide a rich discussion on the changing demand patterns in food markets and their impact on smallholders.
Making value chains work better for the poor: A tool book for practitioners of value chain analysis (M4P 2008).	Club together the thoughts and model to develop a value chain from various development organizations. It includes the calculation of cost, margin, and other financial analysis.
Value chain development for decent work, (ILO 2009).	Suggest various variables related to the concept of decent work, which include employment generation and labor conditions. It gives special emphasis to the role of private players in improving the working conditions of the poors.
Building Competitiveness in Africa's agriculture: A guide to value chain concepts and applications (World Bank 2010)	It mainly focuses on export-oriented value chains with special emphasis on capturing value through integration, economies of scale, clustering, and benchmarking.
Value chain development wiki, (USAID).	This includes various methods, such as knowledge assessment, cost and margin analysis, income distribution, and competitiveness analysis.
Pro-poor value chain development: 25 guiding questions for designing and implementing agro-industry projects, (UNIDO 2011).	Identifies important issues as part of the chain which includes access to assets, social roles, and risks faced by women and youth.

Source: (Donovan et al., 2015)

2.1.4 Value Chain Analysis of Various Agricultural/Horticultural Crops in India

Many studies have been performed to analyze the value chain of various food crops and cash crops in India. The study by Sandeep (2020) analyzed the value chain of four commodities, i.e., Mango, Tomato, Chilly, and Coffee, in the state of Karnataka. To strengthen the value chain, there are many opportunities like improvement in food processing units, government policies, upgrading technology, and eliminating middlemen if they are not adding any value to the value chain. The study by Aurobindo (2021) performed a value chain analysis of Mangoes from Srinivaspur, Kolar district in Karnataka. Particular emphasis was given to estimate the loss incurred in value chain and recommends remedial action to minimise the losses for an efficient value chain. Ramesh (2005) performed value chain of Maize industry

in North Karnataka and recommends various suggestions like backward integration through contract farming and technology upgradation in processing plants to develop a strong value chain. Mohan (2018) studied the value chain of ground nuts, rapeseed/mustard, sesamum, and a proper policy framework is suggested to develop the value addition in the edible oil industry. Similar studies using value chain analysis are performed on various agricultural commodities in different states of India. Sandeep (2018) studied the value chain analysis of Mangoes in Kolar and Ramanagara in Karnataka; Singh (2015) studied the value chain of Maize in Bihar; D (2014) studied value chain of Banana; K (2014) studied value chain of dry chili; Pavithra et al.(2018) rice value chain in Bihar and Karnataka; Tessmann (2018) studied cashew nut value chain in India and Ivory coast; Kodigehalli (2011) studied value chain of coffee in Karnataka; Sen & Kansal (2019) studied value chain of large cardamom in Sikkim; Custodio et al. (2016) studied rice value chain of Eastern India; Minten et al.(2010) studied potato value chain in Bihar.

2.1.5 Value Chain Analysis of Various Agricultural/Horticultural Crops in Northeast India

In the study by Singh et al. (2020), performed a value chain analysis of turmeric in Manipur, Mizoram, Meghalaya, and Sikkim. It was found that processed output fetched higher returns for the product and in terms of cost and return analysis, turmeric is highly profitable in Sikkim. Sikkim is certified as an organic state, the same model can be implemented in other states of Northeast to benefit the various stakeholders in the chain. Organic cultivation and the development of a sustainable and inclusive value chain for small tea growers are discussed in the study (Deka & Goswami, 2022). The study by Yanduri (2022), analyzed the business competencies and performance analysis of the value chain of FPOs of Arunachal Pradesh, and it was found that FPOs are majorly performing agri-input sales followed by output aggregation. Bhagat (2012), studied the supply chain of pineapple, areca nut, and cashew nut in the Garo Hills of Meghalaya, and various constraints faced by the farmers are discussed. It was found that lack of cold storage, processing plants, and dependency on pre-harvest contractors, are major constraints in the chain. Most of the lands in Northeast India are virgin and suitable for organic farming, very few studies are conducted to explore the value chain of various organic crops. Kulkarni and Shahid (2021) discussed issues among various chain actors in the value chain of organic produce in Sikkim. The study by Yadav et al. (2018) focused on low-value realization on large organic cardamom in Sikkim and suggested various measures like organic branding, creating marketing infrastructure, value addition, and information sharing to strengthen the value chain. The value chain of marketing

of organic pineapple is performed by Ao et al.(2018) suggesting various ways to improve sweetness, fiber contents, and shelf life and minimize post-harvest losses. Two studies related to the value chain are found in Arunachal Pradesh on large cardamom and kiwi. Singh et al. (2021) analyzed the large cardamom value chains and suggested measures like proper packaging, scientific storage, and training programs to minimize the wastage. Mani et al. (2018) in the value chain analysis of Kiwi identify various issues in the chain and suggest the formation of " Kiwi Producers Groups". Two studies related to value chain analysis of Assam tea are found and discuss constraints and opportunities in the same sector (Sandeep & Sharma, 2023); (Das & Mishra, 2019). However, no significant studies were found related to value chain analysis of organic agricultural or horticultural crops in Assam.

2.2 Value Chain and Organic Crops (World-Wide Review with Systematic Mapping Approach)

2.2.1 Review Methodology

A systematic mapping study is used to know the research trends in various literature related to the organic food value chain (geographical spread, sector covered, methodology used in the studies). Systematic mapping is a type of secondary study that aims to gain an overview of research trends in specific topics and collect evidence to guide future research (Kitchenham & Charters, 2007). It collects, describes, and catalogs available evidence on a topic that can be used to identify evidence for policy-relevant questions and to guide future primary research (James, *et al*., 2016). In addition, the questions in a mapping study may be more open and comprehensive with fewer restrictions on the categories of articles that can be included (Spendrup & Fernqvist, 2019). A systematic mapping study was chosen because studies on value chain development in the organic food sector are quite broad, and an attempt has been made to include all relevant literature.

There have been several studies using a systematic mapping approach in the agri-food sector. Studies by García-Berná, et al. (2020); Zewge & Dittrich (2017); Schoneveld, et al. (2015); Kushartadi, et al. (2023); Lopes et al. (2022); Matini et al. (2020) maped various literature to know the role of information technology in improving and advancing agricultural practices. In addition, various authors have extensively employed systematic mapping as a methodological approach to get insights into the food environment. The study by Karanja, et al. (2022) discussed the drivers of food choice in low and middle-income countries; Osei-Kwasi, et al. (2020) focused on dietary behaviors in urban food environments in Africa; Spendrup & Fernqvist, (2019) highlighted innovation in agri-food systems; Diaz De Oleo et

al.(2022) discussed food safety outbreak in the hospitality sector in Dominican Republic and Maulina et al.(2020) explored consumer behaviors in halal food using systematic mapping study approach.

The three-staged method of systematic mapping proposed by Karanja et al.(2022) is used.

i. *Identification of search terminologies and evaluation criteria*: The initial stage involves the identification of data sources, the selection of a base year, and the formulation of a search strategy for systematic mapping.

ii. *Selection and screening of articles according to evaluation criteria:* In this stage, articles for systematic mapping are selected with some inclusion criteria.

iii. *Data extraction, analysis, and mapping of the scope and distribution of current evidence*: In this stage, articles are extracted, grouped, and analyzed to know the geographical coverage, sector-specific coverage, research methodology used, and specific areas of studies.

2.2.1.1 Data Source.

Articles included in the Scopus database and Google Scholar from 1990 to 2023 are considered for review. In the present study, the Scopus database is used as compared to the Web of Science and PubMed, as the same covers a wider journal range and helps both in keyword search as compared to WoS (Falagas et al., 2008). PubMed is generally used for biomedical research (Falagas et al., 2008).

2.2.1.2 Selection of Base Year.

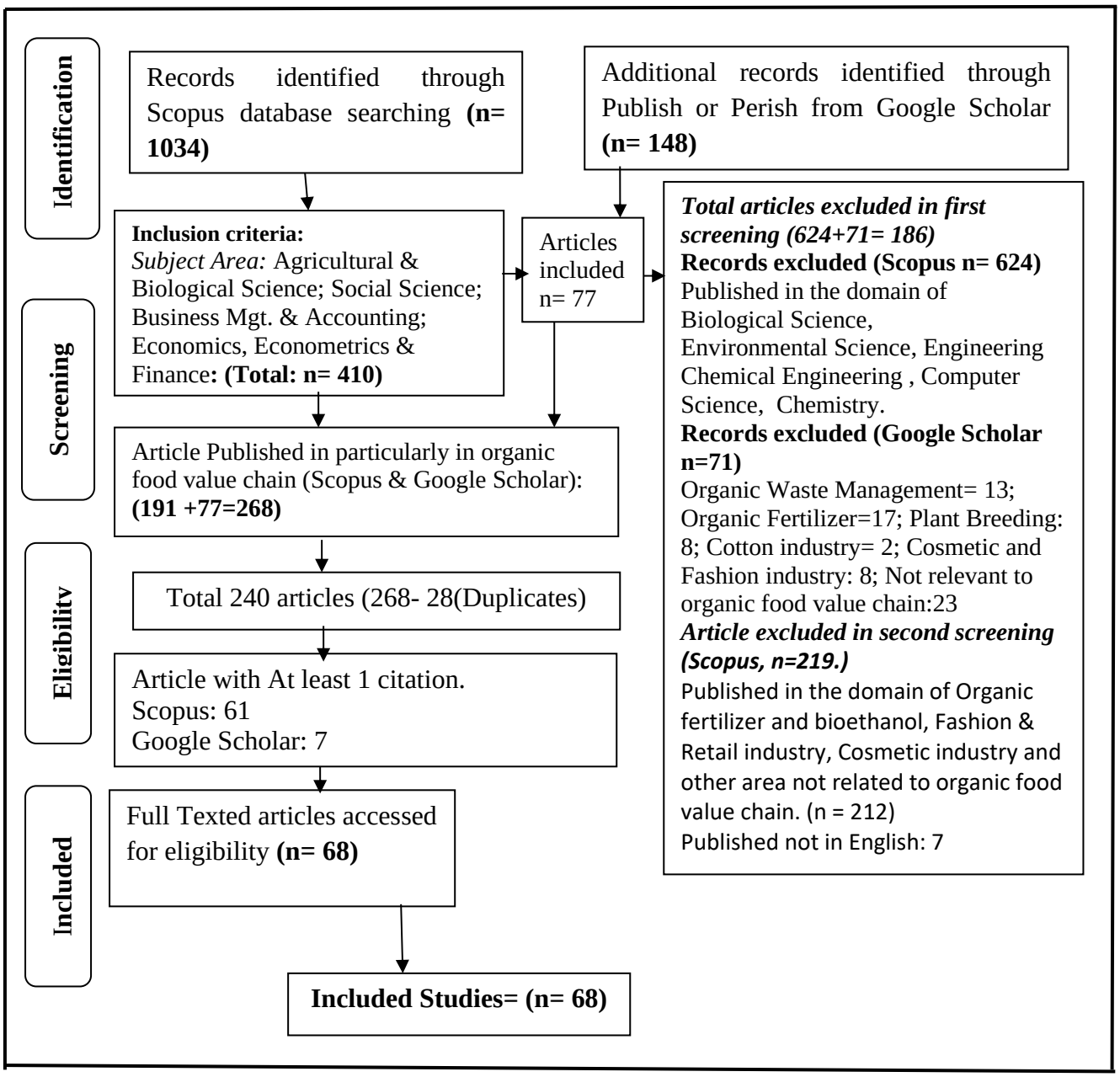
The year 1990 is taken as the base year as the global spread of advancement of organic farming started in the late 1990s. Only five countries were represented when IFOAM (The International Federation of Organic Agriculture Movements) was founded in 1972 and by the late 1990s, it had members of over 100 countries. Moreover, a series of game-changing policies passed in the late 1990s like the world board proposal to open IFOAM to the industry in 1991, the development of European Union regulation in 1991, and the official launch of the IFOAM accreditation programme in 1992 (Geier, 2007).

2.2.1.3 Search Strategy

An initial search was made in the document search option of the Scopus database with " ORGANIC" AND "VALUE CHAIN" in the title, keyword, and abstract search options. A total of 1034 literature was found in the areas related to manufacturing and industry, computer science, environmental science, medicine, stock market, and human capital. A

separate search with "ORGANIC" AND "VALUE CHAIN" is made in Publish or Perish from Google Scholar and 148 articles are found in the same search. To know the articles published exclusively in the domain of organic food value chain, some inclusion criteria are set and 68 articles are thus considered for the study. Inclusion criteria considered for the study are as given (a) Document Type: article, review, note, conference papers, book, book chapter, conference review, editorial, erratum, and short survey. (b) Publication stage: final and article in press (c) Language: English (d) Source type: journal, conference proceeding, book, trade journal, and book series. (e) Country: All the countries appeared in the search list.

Figure 5: ***Showing PRISMA Framework for Selecting the Articles***



Source: Compiled by the author

After setting criteria for inclusion, a total of 68 pieces of literature are considered for the study. The details of inclusion and exclusion criteria considered for the study are shown in the PRISMA framework (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). PRISMA framework is an evidence-based minimum set of items for reporting in systematic reviews(Liberati et al., 2009). The details of the PRISMA statement are shown in above figure.

2.2.1.4 Data Collection.

The set of literature found with the specific search words is downloaded from the Scopus and Publish or Perish database and the same is imported to Microsoft Excel 2019.

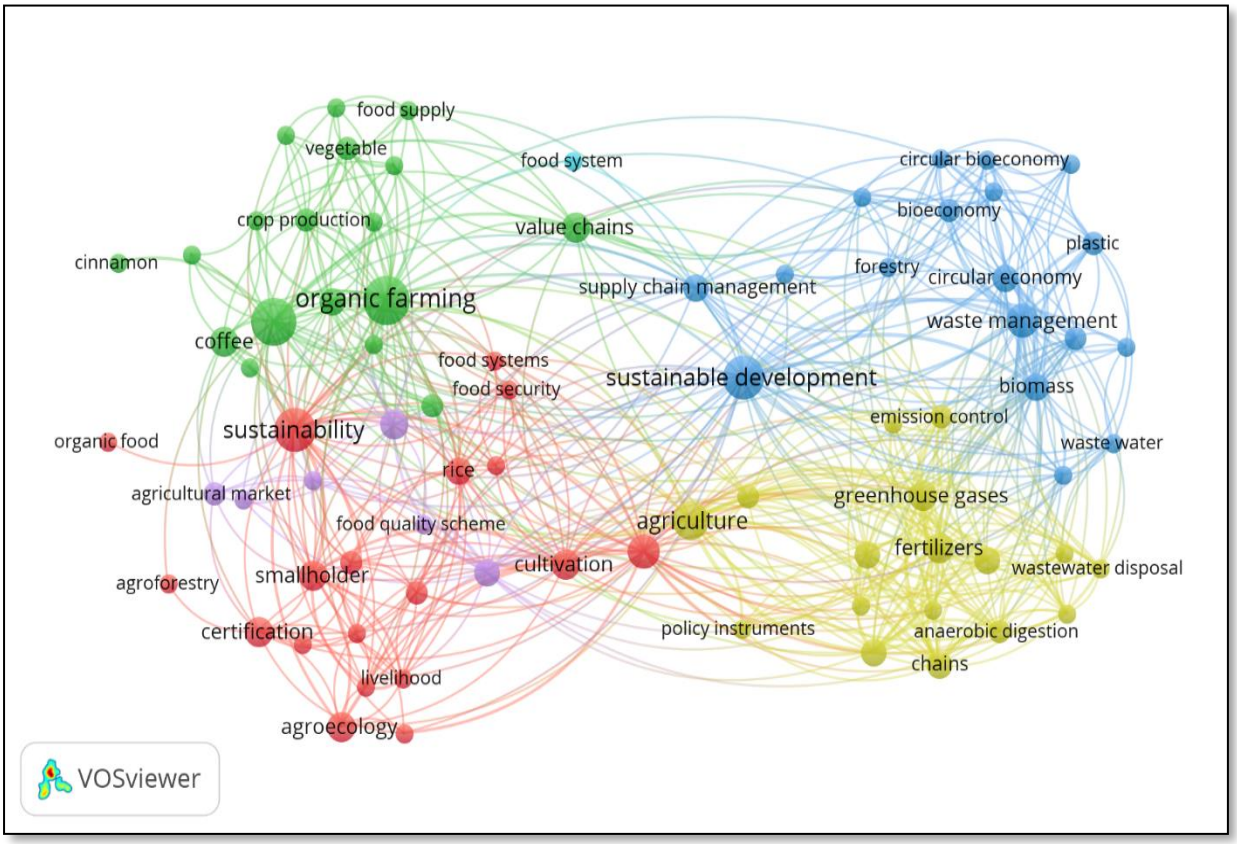
2.2.1.5 Analytical Methods

Li VOS viewer software version 1.6.16 (Leiden University, Leiden, Netherland) is used for making network maps and supports the visualization of these maps. Co-occurrence analysis is used to know the emerging trends of publications.

2.2.2 Identifying Research Hotspot in Organic Food Value Chain, Co-occurrence Analysis

Co-occurrence analysis with the application of bibliometric analysis is performed to know the existing relationship among various literature-related organic food value chains. Co-occurrence analysis is performed to visualize the interrelation and to provide a general theme of research directions of the published literature. Five clusters are identified and are represented by red (cluster 1), green (cluster 2), blue (cluster 3), yellow (cluster 4) and purple (cluster 5). The identified cluster is categorized as (a) “Organic agriculture and sustainable value chain” (19 items), (b) “organic farming and food value chain” (18 items), (c) “organic value chain and sustainable development” (18 items) (d) “organic value chain and environmental impact” (17 items) and lastly (e) organic value chain and profitability (6 items). The co-occurrence analysis is shown with the following figure.

Figure 6: ***Showing Co-occurrence with all Keywords***



Source: Compiled by the author.

Note: The minimum number of occurrences of keywords: 2. Out of 679 keywords,100 meet the threshold. Number of the cluster: 5. Keyword Co-occurrence network visualisation using VOS viewer. Notes: 1. Each node in a network represents an *entity*, i.e., keywords, where in (1) The size of the *node* indicates the *occurrence of keywords* (no. of times that the keywords occur). (2) The *link* between the *nodes* represents the *co-occurrence between keywords*. (3) *The thickness* of the *link* signals the *occurrence of co-occurrence* between keywords. (4) The *bigger the node*, the greater the *occurrence of the keywords* and (5) The *thicker the link* between nodes *greater the occurrence of co-occurrence between keywords*. Each colour represents *a thematic cluster*, wherein the nodes and links in that cluster are used to explain the research theme and relationship that exist(Donthu et al., 2021).

2.2.3 Geographical Classification of Publications

The study classified the literature based on the geographical spread and the country where research is done. From the study it was found that the majority (n=22), are published in the Asian region, followed by (n=13) published in the African region. In country-wise, India and China rank first with (n=5) articles each. From the study, it was found that the value chain of organic crops in developing countries, is characterized by low-value processing/value addition, lack of market linkage, and weak governance structure (Abebe et al., 2022); (Das & Roy, 2021); (Dan & Jitea, 2023). The articles published covering two or more countries particularly focused on the global value chain approach and one is a review study performed

by (Boora & Sharma, 2021). The details of the geographical spread of the articles are shown in the below table.

Table 7: ***Showing Geographical Spread of Literatures of Organic Food Value Chain***

Region	Countries	No. of Articles	Reference
Africa	Uganda	3	(Kasente, 2012);(Mutebi Kalibwani et al., 2018); (Kwikiriza et al., 2016)
	Tanzania	2	(Bullock et al., 2018);(Mbapila et al., 2019)
	Uruguay	1	(Groot Kormelinck et al., 2019)
	Burkina Faso	1	(Kini et al., 2020)
	Sub-Saharan Africa	1	(Sebhatu, 2008)
	Uganda and Ghana	1	(Lyons, 2019)
	Ghana	1	(Ouma et al., 2013)
	Benin	1	(Van den Broeck et al., 2017)
Australia	Australia	1	(Bhaskaran et al., 2006)
Asia	Vietnam	1	(Ha et al., 2012)
	China	5	(McCarthy et al., 2016);(Yan et al., 2017);(Wang, 2012);(Zhao et al., 2019);(Asli et al., 2017)
	Nepal,	2	(Atreya & Kafle, 2016);(Aoki & Suvedi, 2012)
	Thailand	2	(Prasertwattanakul & Ongkunaruk, 2018); (Moore & Donaldson, 2023)
	Philippine	2	(Acosta et al., 2019); (Melo, 2021).
	Malaysia	1	(Othman et al., 2016)
	India	5	(Yadav et al., 2018); (Sahoo & Sarangi, 2018);(Eyhorn et al., 2018); (Das & Roy, 2021); (Shijagurumayum et al., 2022)
	EWEC	1	(Lord & Tangtrongjita, 2010)
	Lebanon	1	(Abebe et al., 2022)
	Sri Lanka	1	(Hansika & Wijerathna, 2021)
	Indonesia	1	(Apriyani et al., 2021)
Europe	European Union	4	(Directorate-General for Agriculture and Rural Development (European Commission) et al., 2016); (Arfini & Bellassen, 2019);(Winter et al., 2021); (Smadja & Muel, 2021).
	Germany	1	(Braun et al., 2018)
	Denmark	1	(Deleuran, 2011)
	Serbia	1	(Milic et al., 2017)
	Ireland	1	(O'Donoghue et al., 2018)
	Romania	2	(Munteanu & Munteanu, 2014); (Dan & Jitea, 2023).
	Croatia	1	(Maksan & Brečić, 2019)
	Norway	1	(Steinnes et al., 2019)
	Italy	1	(Dara Guccione et al., 2021)
South America	Latin America	2	(Kilian et al., 2000);(Mancini, 2013)
	Bolivia	1	(Garming et al., 2011)
	Brazil	1	(Ríos Guayasamín et al., 2016a)
North America	Mesoamerica region	1	(Lyon et al., 2010)
	USA	2	(Guptill, 2009);(Baker & Russell, 2017)
	Dominican Republic	1	(Vagneron & Roquigny, 2011)
	Nicaragua	1	(Beuchelt et al., 2010)
All Region	Global	3	(Mutersbaugh, 2005);(González & Parga-Dans, 2020); (Boora & Sharma, 2021)
	Germany and Australia	1	(Bernzen, 2013)
	India and Germany	1	(Hassler & Franz, 2013)
	Australia and EU	1	(Bernzen, 2013)
	Netherland and USA	1	(Mook & Overdevest, 2021)

Source: Compiled by the author.

Note: EWEC stands for (East-West Economic Corridor includes 5 Southeast Asian countries i.e., Myanmar, Thailand, Laos, Cambodia & Vietnam).

The book titled “Sustainability of European Food Quality Schemes: Multi-performance, Structure, and Governance of PDO, PGI, and Organic Agri-food Systems” by (Arfini & Bellassen, 2019), discussed the sector-specific scenario of organic food quality and value chain in various European countries. The cereal and bakery sector covers organic flour and Camargue rice in France and organic pasta in Poland. Similarly, the fruits and vegetable sector, includes organic olive oil in Croatia, organic tomatoes in Italy, and organic raspberries in Serbia. In addition to this, it also includes organic pork in Germany, organic yoghurt in Germany, and organic salmon in Norway.

2.2.4 Sector-Specific Studies in the Organic Food Value Chain

The present study classified the literature into 11 sectors based on the targeted industry and sector. Again from the key sector, the literature is sub-grouped based on the specific area they covered. The study found that the majority of the literature is published in the fruit and vegetable sector with (n=22), followed by the cereals sector with (n=9) articles. In crop-specific sectors, the majority, i.e., (n=10) are published each in the organic vegetable sectors, followed by organic rice and organic coffee sector with (n=7) articles each. From the study, it was found that various authors performed crop-specific studies like the organic pumpkins by Das & Roy, (2021): organic tomato Abebe et al. (2022); organic pineapple by Kwikiriza et al. (2016); Mutebi Kalibwani et al., (2018) and various authors performed value chain analysis on two or more crops or took the sector as a whole like organic vegetable sector, organic rice sector. Around nine literatures have been published covering general aspects of the value chain like constraints, and ways of improving the existing value chain, and did not cover any particular organic crop value chain. The details of the sector-wise distribution of literature are shown in the following table.

Table 8*: Showing Sector-Specific Studies in the Organic Food Value Chain*

Key Sectors	Specific Sector	No. of Article	Reference
Beverages	Organic Coffee	7	(Mutersbaugh, 2005);(Lyon et al., 2010);(Hernandez-Aguilera et al., 2018);(Kasente, 2012);(Kilian et al., 2005);(Aoki & Suvedi, 2012);(Beuchelt et al., 2010).
Cereals	Organic Rice	7	(Van den Broeck et al., 2017);(Prasertwattanakul & Ongkunaruk, 2018);(Eyhorn et al., 2018);(Othman et al., 2016); (Dara Guccione et al., 2021); (Melo, 2021); (Shijagurumayum et al., 2022).
	Cereals and Bakery	1	(Arfini & Bellassen, 2019)
	Organic Wheat	1	(Baker & Russell, 2017)
Pulses and Oil seeds	Organic coconut oil	1	(Acosta et al., 2019)
	Organic Olive Oil	1	(Maksan & Brečić, 2019)
Fruits and Vegetables	Organic Mango	1	(Ouma et al., 2013)
	Organic Pineapple,	2	(Kwikiriza et al., 2016);(Mutebi Kalibwani et al., 2018)
	Organic apple	1	(Atreya & Kafle, 2016)
	Organic Banana	3	(Vagneron & Roquigny, 2011);(Garming et al., 2011);(Kilian et al., 2005).
	Organic Vegetable	10	(Arfini & Bellassen, 2019);(Deleuran, 2011); (Groot Kormelinck et al., 2019);(Braun et al., 2018);(Lord & Tangtrongjita, 2010);(Wang, 2012);(Kini et al., 2020); (Smadja & Muel, 2021); (Apriyani et al., 2021); (Dan & Jitea, 2023).
	Organic Tomato & Sweet Pepper	2	(Mbapila et al., 2019); (Abebe et al., 2022)
	Organic Citrus	1	(Mook & Overdevest, 2021)
	Organic Raspberries	1	(Milic et al., 2017)
	Organic Pumpkin	1	(Das & Roy, 2021)
Live stocks	Meat	1	(Arfini & Bellassen, 2019)
	Organic beef	1	(O'Donoghue et al., 2018)
Diary	Organic Diary	3	(Guptill, 2009);(Arfini & Bellassen, 2019);(Zhao et al., 2019)
Spices and Condiments	Organic Spice	1	(Bullock et al., 2018)
	Organic black pepper	1	(Hassler & Franz, 2013)
	Organic turmeric	1	(Sahoo & Sarangi, 2018)
	Large cardamon	1	(Yadav et al., 2018)
Nuts	Wall-nut	1	(Yan et al., 2017)
Aquaculture	Shrimp-mangrove farming	2	(Ha et al., 2012);(Arfini & Bellassen, 2019)
	Fish & seafood sector		
	Organic Salmon	1	(Steinnes et al., 2019)
Breeding and Organic seed sector		1	(Winter et al., 2021)
General organic food value chain		9	(Directorate-General for Agriculture and Rural Development (European Commission) et al., 2016);(Ríos Guayasamín et al., 2016a);(Munteanu & Munteanu, 2014);(Asli et al., 2017);(Lyon et al., 2010);(González & Parga-Dans, 2020); (Moore & Donaldson, 2023); (Boora & Sharma, 2021).

Source: Compiled by the author.

2.2.5 Research Methodologies Used in the Reviewed Articles

The study found that the majority of the articles, (n=47) are empirical. In the same category, (n=28) are descriptive and use a survey approach, while (n=19) use a case study approach. In descriptive studies, samples are taken from various stakeholders in the chain like farmers, wholesalers, commission agents, and retailers to know the various aspects of the value chain related to network structure, cost, margin, value chain upgradation, and governance structure. The details of the research methodologies used in the reviewed articles are shown in the below table.

Table 9: ***Showing Research Methodologies Used in the Reviewed Articles***

Method-ology	Specific Methods	No. of Articles	Reference
Empirical	Survey (Descriptive statistics)	32	(Bhaskaran, et al., 2006); (Lyon, et al., 2010); (Guptil, 2009); (Ha, et al., 2012); (McCarthy, et al., 2016); (Atreya & Kafle, 2018); (Vagneron & Roquigny, 2011); (Mutersbaugh, 2005); (Van den Broeck, et al., 2017); (Bullock, et al., 2018); (Mutebi Kalibwani, et al., 2018); (Deleuran, 2011); (Arfini & Bellassen, 2019); (Sahoo & Sarangi, 2018); (Garming, et al., 2011); (Eyhorn, et al., 2018); (Ríos Guayasamín, et al., 2016); (Milić, et al., 2017);(Bernzen, 2013); (Mbapila, et al., 2019); (Asli, et al., 2017); (Othman, et al., 2016); (Lyons, 2019); (Beuchelt, et al., 2010); (Winter, et al., 2021); (Mook & Overdevest, 2021); (Yadav, et al., 2018);(Acosta et al., 2019); (Abebe et al., 2022); (Das & Roy, 2021); (Moore & Donaldson, 2023); (Dan & Jitea, 2023)
	Case study	21	(Mancini, 2013); (Ouma, et al., 2013); (Bernzen & Braun, 2014); (Kasente, 2012); (Directorate-General for Agriculture and Rural Development (European Commission) et al., 2016); (Prasertwattanakul & Ongkunaruk, 2018); (Groot Kormelinck, et al., 2019); (Braun, et al., 2018); (Arfini & Bellassen, 2019); (Hassler & Franz, 2013); (Wang, 2012); (Kini, et al., 2020); (Zhao, et al., 2020); (O'Donoghue, et al., 2018); (Baker & Russell, 2017); (Sebhatu, 2008); (Maksan & Brecic, 2019); (Steinnes, et al., 2019); (Aoki & Suvedi, 2012); (Smadja & Muel, 2021); (Apriyani et al., 2021)
Quanti-tative	Mathematical model	4	(Hernandez-Aguilera, et al., 2018); (Kini, et al., 2020); (Zhao, et al., 2020); (Apriyani et al., 2021).
	Analytical method	2	(Kwikiriza, et al., 2016); (Yan, et al., 2017); (Sahoo & Sarangi, 2018)
	Secondary data	2	(Garming, et al., 2011); (Apriyani et al., 2021)
Mixed	Qualitative and quantitative	6	(Mutebi Kalibwani, et al., 2018); (Ríos Guayasamín, et al., 2016); (Hansika & Wijerathna, 2021); (Dara Guccione et al., 2021); (Melo, 2021); (Shijagurumayum et al., 2022).
Opinion based	Editorial/ Perspective	1	(González & Parga-Dans, 2020)
Value Chain Model		3	GTZ (2007): (Ríos Guayasamín, et al., 2016) Kaplinsky & Morris (2001) and UNIDO (2009): (Wang, 2012);Porters theory of competitive advantage:(Asli, et al., 2017)
Review		1	(Boora & Sharma, 2021)

Source: Compiled by the author.

From the previous table, it was found that for empirical studies, primary data is mostly used and collected mostly by schedules, observation, focus group discussion, and interview methods. Aside from that, around eight articles took a quantitative approach, employing a variety of mathematical models, analytical approaches, and secondary data analysis. The study by Boora & Sharma(2021) reviewed the various literature published in the organic food sector for 15 years (2004-2019). Various common constraints like high prices of organic food, lack of awareness of organic food, and lack of policies and incentives are found in the chain.

2.2.6 Themes or Focus Area of the Reviewed Articles

The study segregated the literature according to the focus theme of the research covering various aspects of the organic food value chain. In line with the major area, articles are again sub-grouped based on the specific focus area of research. The study found that around 11 numbers of articles performed a complete value chain study of various organic crops by including three or four steps of value chain analysis which are chain mapping, cost and margin determination, value chain upgradation, and governance structure. The details of the classification of the literature related to the organic food value chain based on major and specific areas of research with the author's name are shown in the below table.

Table 10: ***Showing Major and Specific Areas of Research in the Organic Food Value Chain***

Major Area of Research	**Specific area**	**No. of Article**	**Reference**
1. Value Chain Analysis	(a) Value chain mapping, Governance structure, Cost & Margin, and Chain up-gradation.	11	(Mutebi Kalibwani, et al., 2018); (Sahoo & Sarangi, 2018); (Wang, 2012); (Maksan & Brecic, 2019); (Aoki & Suvedi, 2012); (Beuchelt, et al., 2010); (Yadav, et al., 2018); (Abebe et al., 2022); (Das & Roy, 2021);(Dan & Jitea, 2023); (Kini, et al., 2020).
	(b) Integration of smallholders in the global value chain	3	(Ouma, et al., 2013); (Sebhatu, 2008); (Moore & Donaldson, 2023).
	(c) Trade coordination in the global value chain	1	(Bernzen & Braun, 2014)
	(d) Global value chain	1	
	(e) Global Production Theory	1	(Kwikiriza, et al., 2016)
	(f) Organic vegetables in school	1	(Hassler & Franz, 2013)
	(g) Consumer Perception	1	(Braun, et al., 2018)
	(h) Value Chain of Organic Breeding and Seed	1	(Deleuran, 2011)
		1	(Winter, et al., 2021)

Table 10 (Continued)			
2. Value Chain: Global Standard and certification	(a) Standard & certification in global trade	8	(Mutersbaugh, 2005); (Bernzen & Braun, 2014); (Arora, et al., 2013); (Costa, et al., 2019); (Bernzen, 2012); (Lyons, 2019); (Mook & Overdevest, 2021); (Dara Guccione et al., 2021)
	(b) Adaptation of organic certified and green food	2	(Bhaskaran, et al., 2006); (McCarthy, et al., 2016)
	(c) Geographical Indication and organic certification	2	(Mancini, 2013); (Ha, et al., 2012);
	(d) Fairtrade certificate	4	(Kilian, et al., 2005) (Van den Broeck, et al., 2017); (Kasente, 2012); (Vagneron & Roquigny, 2011)
	(e) Third-Party Certification	1	(Zhao, et al., 2020)
	(f) Certification and labeling	1	(Alonso González & Parga-Dans, 2020)
3. Value Chain Mapping	(a) Marketing Channels of Chain	6	(Lord & Tangtrongjita, 2011); (Abebe et al., 2022); (Das & Roy, 2021); (Dan & Jitea, 2023); (Sahoo & Sarangi, 2018); (Mutebi Kalibwani, et al., 2018)
	(b) Marketing Channels and Price Spread	2	(Sahoo & Sarangi, 2018); (Abebe et al., 2022);
	(c) Mapping and price spread of a wide range of organic products	1	(Ríos Guayasamín, et al., 2016)
	(d) Mapping of the progression of the organic and conventional beef sector	1	(O'Donoghue, et al., 2018)
3. Economic Analysis of the value chain.	(a) Organic and conventional apple	1	(Atreya & Kafle, 2018)
	(b) Cost-Benefit of members and non-members; Value distribution in conventional, organic, and fair trade in Banana VC.	2	(Vagneron & Roquigny, 2011); (Garming, et al., 2011)
	(c) Cost and Margin in Organic Pineapple	1	(Mutebi Kalibwani, et al., 2018)
	(d) Cost and Margin of organic rice.	2	(Eyhorn, et al., 2018); (Melo, 2021)
	(e) Economic analysis of organic raspberries	1	(Milić, et al., 2017)
	(f) Cost and Margin of organic tomatoes, sweet pepper	2	(Mbapila, et al., 2019); (Abebe et al., 2022)
	(g) Price Spread and marketing Margin.	1	(Sahoo & Sarangi, 2018)
4. Value Chain Upgradation	(a) Innovation in the organic food industry	2	(McCarthy, et al., 2016); (Hansika & Wijerathna, 2021)

and Innovation	(b) Smallholder chain up-gradation	2	(Hernandez-Aguilera, et al., 2018); (Moore & Donaldson, 2023)
	(c) Vertical Integration	2	(Prasertwattanakul & Ongkunaruk, 2018); (Baker & Russell, 2017)
	(d) Upgrading strategy	6	(Mutebi Kalibwani, et al., 2018) (Arfini & Bellassen, 2019); (Othman, et al., 2016); (Das & Roy, 2021); (Wang, 2012); (Smadja & Muel, 2021)
	(e) Constraints and Opportunities in the Value Chain	4	(Das & Roy, 2021); (Wang, 2012); (Dan & Jitea, 2023); (Dara Guccione et al., 2021)
5. Governance structure of the value chain	i/ Gender Equity	2	(Lyon, et al., 2010); (Bullock, et al., 2018)
	ii/ Relationship and Linkage; Government intervention. Power relation in the chain	4	(Guptil, 2009); (Ha, et al., 2012); (Mutebi Kalibwani, et al., 2018); (Das & Roy, 2021).
	iii/ Pricing Policies	4	(Sanders, et al., 2016) (Arfini & Bellassen, 2019) (Yan, et al., 2017); (Kilian, et al., 2005)
	iv/ Information asymmetry	1	(Zhao, et al., 2020)
	v/ Risk Assessment	1	(Munteanu, 2014)
	vi/ Competitive advantage	2	(Asli, et al., 2017); (Steinnes, et al., 2019)
6. Producers Organization	i/ Organisational characteristic of Producer organization; Marketing practices.	2	(Groot Kormelinck, et al., 2019); (Garming, et al., 2011).

Source: Compiled by the author

2.2.6.1 Value Chain Analysis

Various articles are found that covered the complete steps of general value chain analysis, i.e., mapping, economic analysis, value chain up-gradation, and governance structure. The study by Sahoo and Sarangi (2018) discussed the complete value chain of organic turmeric in Odisha, India. In value chain mapping of the same, three marketing channels are identified: ***Channel 1*** (Producer- Small trader -Big trader- Processor Retailer- Consumer); ***Channel 2*** (Producer- Big trader- Processor-Retailer- Consumer); ***Channel 3*** (Producer-KASAM (Kandhamal Apex Spices Association for Marketing)-Processor- Retailer-Consumer) with marketing efficiency of 0.66, 0.67 and 0.33 for channel 1, 2 and 3 respectively. In price spread, the producer's share in the consumer rupee is 40%, 40.66%, and 25% for channels 1, 2, and 3 respectively. The marketing efficiency and price spread for channels 1 and 2 are almost the same. For an efficient value chain, introducing appropriate variety, quality of

seeds, irrigation requirements, scientific drying, processing methods, post-harvest management, and e -e-tendering is suggested for product marketing. The study by Wang (2012) on the organic vegetable value chain of Yangxian County, China discussed mapping the value chain, upgrading strategies, constraints, and opportunities in the chain. It was found that two groups of farmers are producing organic vegetables: one is certified organic producers and the other is non-certified organic producers. It was found that around 90% of certified organic vegetables and 80% of non-certified organic vegetables go through collection, wholesale, and retail sales before reaching consumers. The organic vegetables produced are mainly used for domestic consumption and the market price is the same for both certified and non-certified organic products. For better market linkage and a strong governance structure, value chain upgrading in the form of products (by bringing new varieties), processes (by improving deep processing), and functional up-gradation (to integrate chain actors and to shorten the supply chain) is recommended. Lack of consumer awareness, lack of direct access to the market, and lack of value-added organic products are major constraints found in the same chain. However, special emphasis is given to contract farming and to develop a market linkage between farmers to super supermarkets as an opportunity to upgrade the value chain.

Beuchelt et al. (2010), discussed the added value of certification by conventional and organic-fair trade chain actors in terms of price, income shares, information flows, and governance structure of the organic coffee sector in Nicaragua. It was found that the share of the producer's price on the final retail price is substantially lower in the certified chain as compared to the conventional. Moreover, certification to add value does not benefit producers due to information asymmetry, governance issues, and long-chain structure leading to high transaction costs. Policy measures to expand the business knowledge of producers, and cooperatives and credit extension are suggested to increase production and to have a regulated and strong value chain. Similarly, the organic coffee sector in Nepal is snowballing, and the study by Aoki & Suvedi (2012) explored the possibilities of organic coffee production to support the livelihood of small-scale farmers in Nepal through the Value Chain Approach. It was found that quality management, information gap over coffee prices, monopoly, and political instability are major factors leading to the weak value chain in the organic coffee sector.

The multi-stakeholder approach, including the involvement of private players in the value chain, supports farmers to increase their income. The study by Mutebi Kalibwani et al.(2018)

in the value chain analysis of organic pineapple in Uganda, discussed how multi-stakeholder participation in value chain development supports farmers, to improve production, processing, and marketing activities. It was also found that certified organic producers had a higher gross margin per acre than conventional producers. Creating proper market infrastructure with branding and global certification standards is crucial in exploring the premium market of the organic food sector. Yadav et al. (2018) in their study, found that although India is the largest producer of large cardamom in the world, organic cardamon from Sikkim is not found in the premium market. A strong and regulated value chain with proper market infrastructure is recommended for entering the global organic spice market. The Protected Designation of Origin (PDO) production system is emerging as a tool to strengthen the value chain. Maksan & Brecic (2019) discussed the complete value chain of organic olive oil in Croatia with special emphasis on the PDO production system. Further, it focuses on exploring the export market by developing product labeling with PDO of olive oil.

Global Value Chain (GVC) has become increasingly performative and one of the most powerful tools for market construction. The integration of smallholders into the global value chain and global market relies on exclusionary representation and the forming of new associations (Ouma, et al., 2013). The study by Moore & Donaldson (2023) suggested a mechanism to link small-scale farmers to a global value chain which will enhance smallholders' livelihoods, trigger rural development, and lead to more sustainable practices in agriculture. In line with this, the study by Hassler & Franz (2013) discussed how organic pepper from India is marketed in Germany with a Global Production Network approach with elements of the Global Value Chain. GVC network empowers local organic farmers and plays a bridging role in the distinctive lifestyle consumption of consumers in various countries. Sebhatu, (2008) focused on smallholders' participation in value chain collaboration with corporations and NGOs to alleviate poverty by creating new and niche markets for mature organic and fair-trade markets. The study by Kwikiriza, et al.(2016), used the Global Value Chain Framework and found only 45% of the organic pineapple produced by farmers reaches organic consumers. The study recommended increased use of soil amendments, favorable legislation, an investment environment, and increased horizontal coordination among exporters, which will increase organic pineapple sales. In the global value chain, both industrial and market conventions are important for cross-border trade. Bernzen & Braun (2014), related to organic food import from Germany and Australia, it was found that along with industrial convention, market convention (i.e., the importance of price and

competitiveness) are stressed more by Australian firms, and it was agreed that compromises between conventions are sometimes necessary for cross border trade.

In contrast to the global value chain, the local value chain is confined to a small area and meets local demand. Braun et al. (2018) emphasized developing an efficient local organic vegetable value chain to supply school catering in Berlin, Germany. It is suggested that giving more incentives to farmers to grow organic vegetables, infrastructure support in processing fresh vegetables and improving the organizational structure in the chain can strengthen the local value chain.

Few studies focused on consumer preference and awareness related to value chain structure. The study by Deleuran (2011) investigated the preference of consumers for organic baby leaf products in two different chain structures i.e., an industrialized chain (farm to fork) and box scheme concept. In the industrialized chain, 89% of the respondents demanded more products, and in the box scheme concept, 83% of consumers were very content with the baby leaf product they received. Considering the increasing demand, the quality of organic seeds is important for baby leaf production and should considered as the initial step in the chain, not just raw material. Kini et al. (2020) organic vegetables in Burkina Faso, used the count model outcomes and revealed that distance traveled by the consumer, and the expected utilization of food are two major determinates for demand. In addition to this, consumer health awareness is also a significant driver of demand for organic foods.

Input supplier is an integral part of the value chain. The study by Winter et al. (2021) discussed the importance of value chain partnerships to distribute the burden for refinancing breeding to strengthen the whole organic sector. Four success factors have been identified as cross-sector pool strategy to secure the integrity of the future organic product supply chain is (i) a long-term commitment (ii) a pool of funds for organic cultivator development (iii) awareness-raising on the importance of breeding and (iv) high level of transparency in the process. Regulated and integrated breeding activities are considered a vital measure to achieve higher organic seed use and help in overcoming the shortage of organic seeds.

The study by Abebe et al. (2022) in the value chain analysis of organic tomatoes in Lebanon revealed that a huge gap in price spread exists when products are marketed through market intermediaries. It was found that distributors share a 40% to 60% margin in consumer price. However, for direct sales, (when distributor is skipped) the benefit to the farmers and the same is best for both farmers and consumers. Although in direct marketing, the margin is

higher in the hands of farmers, there is a risk associated with farmers as the entire stock may not be sold which may cause loss to the farmers. The study by Das & Roy (2021) discussed the value chain of organic pumpkins in India and covered the network structure, upgradation strategy, and governance structure of the value chain. It was found that the value chain of organic pumpkins is very weak as the organic products are mixed with conventional chains by the market intermediaries. Organic pumpkins are sold in fresh form and value-addition functions like processing, packaging, and labeling are missing. In the study by Dan & Jitea (2023) in the value chain analysis of organic vegetables in Romania found three marketing channels. The majority, i.e. around 45.50% of the farmers used the second channel (farmers-retailers-consumers) followed by the first channel (Direct sales) which is used by around 27.30% of the farmers. Only 9.10% of the farmers used the third channel (farmers-wholesalers-retailers-consumers) and the remaining 18.10% of the farmers are using mixed channels (more than two). The organic vegetables are mostly sold in fresh form and processing functions in the chain are missing.

From the above literature, it was found that most of the studies related to value chain analysis focused on three or four aspects of the value chain. The study by Dan & Jitea (2023); Das & Roy (2021) and Wang (2012) focused on value chain mapping, chain upgradation, constraints and opportunities, and governance structure of the chain but excluded the cost and margin analysis of the value chain. However, the study by Abebe et al. (2022) and Sahoo & Sarangi (2018) focused on value chain mapping, analysis of cost and margin, and identifying constraints and opportunities in the chain. Apart from these studies, others are mostly focused on identifying constraints and suggesting ways to improve the organic value chain. None of the studies all four aspects of the value chain which are identifying network structure, analysis of cost and margin at various stages of the chain, identification of constraints and opportunities in the chain, and analysis of the governance structure of the chain.

The study found that, in most of the articles related to the organic vegetable value chain, maintaining an end-to-end organic value chain needs strict policy implementation at various stages of the chain. The studies by Das & Roy (2021); Wang (2012); Yadav et al. (2018) revealed that in most cases, organic products used for domestic consumption are being mixed with the conventional chain. The products are yet to reach the premium organic market. Farmers do not benefit from growing organic crops, as the market price for organic products and conventional products is the same. Among all the marketing channels, the study by Abebe et al. (2022) found that direct sales (farmers- consumers) are beneficial to farmers as

farmers get a high share in consumer prices, but there is a risk associated as some organic products may remain as unsold. The risk associated with direct sales can be minimized if farmers use some innovative ways of direct sales like a weekly basket, online order, and transport delivery system(Dan & Jitea, 2023). The study found that chain leakage in marketing channels is addressed by various authors, however, the percentage of leakage varies across products and countries. In the study by Kwikiriza, et al. (2016) in the organic pineapple value chain in Uganda, found that around 45% of the organic produce reaches final consumers. In contrast to this, the study by Wang (2012), revealed that market leakage is relatively low in the organic vegetable value chain in Yangxian County, China. Around 90% of certified organic vegetables and 80% of non-certified organic vegetables go through the chain with various market intermediaries before reaching consumers.

The present study finds that many of the studies focused on the integration of smallholders with the global value chain to enhance the livelihood of smallholders and explore the global organic food market (Moore & Donaldson, 2023; Ouma, et al, 2013; Kwikiriza, et al. 2016; Hassler & Franz 2013). Integration with the global value chain requires stringent policies, certification norms, and compliance with both industrial and market conventions (Bernzen & Braun,2014). As the global value chain needs strict compliance with certification norms, organic farmers may focus on developing a local value chain to trade the organic produce which shall confined to small areas and meet local demands (Braun et al., 2018).

2.2.6.2 Value Chain: Globalised Standard and Certification

International Federation of Organic Agriculture Movements (IFOAM) formulated the first version of IFOAM Basic Standards (IBS), and taking this as a benchmark, various public and private standard-setting bodies are developing more specific organic standards to explore the global market. Many countries have developed national organic regulations to protect honest organic producers and consumers against misleading organic products. The first organic regulations were adopted in the United States of America. France was the first country to adopt organic regulation in Europe in 1985, and European Regulation 2092/91, covering the labeling of organic food, was adopted in 1991. Apart from these, the Japanese Agriculture Standard (JAS) and standards of the US National Organic Program (2002) are widely accepted standards for organic products (FAO, 2022). Many studies published highlighting the standard followed and certification policies of various countries. The certification and standards norms are different across the regions and countries. The study by Bernzen &

Braun (2014) revealed that industrial conventions such as third-party certification and standards are significant in cross-border trade, particularly with the European Union. In Germany, certification is a must and in Australia, the same is perceived as quasi-mandatory. Apart from the industrial convention, less tangible factors, such as trust established through relationship management, are also significant. To explore the organic food market, and to participate in the global value chain, the producer must comply with global standards. However, the disjuncture between the official script of the GVC standard and actual cultivation practices is found between farmers in North Indian organic rice cultivation. The appropriate size of the disjuncture between GVC and farmers can be determined through participatory "democratic" deliberation in the standard-making process. It is suggested that the buyer firms nurture the diversity of cultivation practices of farmers with socio-ecological conditions, rather than promoting standard best practices uniformly (Arora, et al., 2013). Organic certification supported by Geographical Indication (GI) with adequate rural policies and legislation may allow developing countries to move into a lucrative niche global organic food market (Mancini, 2013).

Bernzen, (2012) discussed the importance of standards in the production and trade of organic food globally with particular emphasis on certification for organic products in Australia and the European Union. It is revealed that countries should focus more on developing mandatory certification systems such as the EU or the US instead of voluntary standards to extend global trade. Apart from developing global standards, emphasis is also to be given to incorporating smallholders in the global value chain. The study by Lyons (2019) revealed that as the standard-setting process depends mostly on exporters and excludes small farmers, the adoption of group certification has provided deliberative capacity and inclusion of smallholders in global organic governance to promote export. For small farmers, certification is generally backed by government policy. Zhao et al. (2020) revealed that the organic milk market in China is vertically integrated, and a strong value chain is good at managing the transaction cost caused by information asymmetry. The weak value chain will always fail even if with a certification system promoted by the government.

Four shifts associated with the global standard, i.e., increased importance of multilateral institutions, changes to the standard language, displacement of the network-specific standards, and shift away from relational standards. Having a uniform single-label strategy can be effective in building broad coalitions for protective standards that prefer weaker, contract-based standards (Mutersbaugh, 2005). Consumers are often confused with symbols

and labels to use for green, environmentally sustainable, and eco-friendly products. The study by Bhaskaran et al.(2006) revealed that marketing initiatives such as incorporating symbols to differentiate and distinguish environmentally sustainable food products are unlikely to increase demand for these products. However, consumers have a strong and positive belief in the use of specific production protocols, third-party accreditation, and beliefs regarding product attributes. The same can be clearly distinguished from non-organic foods. In contrast to this, it was found that the three terms (green, environmentally sustainable, and eco-friendly) are vague and convey very little about the production process and product attributes. Consumer attitudes and behavior towards organic food and green food are different across the region. The study by McCarthy et al.(2016) focuses on the consumer attitude towards organic certified and green food among Chinese consumers. It was found that purchasing certified organic food is associated with demographic variables like income, education, gender, household size, place of living, and overseas experience. Moreover, it was found that men preferred green food and females towards certified organic food.

Among various factors that shape markets for different kinds of certification schemes, including Fair Trade, Organic, and Global GAP for US and Dutch importers, industry-sponsored business-to-business certification systems have outcompeted consumer-facing label systems (Mook & Overdevest, 2021). Compared with other certification standards, fair trade certification has emerged as a response to consumers and corporates about the production conditions and is certified against the Fairtrade Standards. The study by Kilian et al. (2005) found that fair-trade organic producers received price premiums, and it depends particularly on product and production practices. Although high price is obtained in the certified organic value chain, producers share relatively less as compared to retailers. In the study by Vagneron & Roquigny (2011), it was also found that the same actors are involved in the certified organic banana value chain in the Dominican as the conventional chain. Downstream actors control the vital decisions in the value chain, and power concentration is also confined to these actors. In contrast to this, the study by Van den Broeck et al. (2017) in Benin, West Africa, found that farmers are willing to accept Fair Trade Certification but not organic-FT certification due to its strict compliance. Among three types of contracts (domestic, Fairtrade, and Fairtrade-organic), the farmers least prefer the fair-trade organic contracts, and adding organic requirements in fair-trade contracts may undermine the adoption and spread of fairtrade certification in the rice sector of Benin. Third-party certification can be used to reduce information asymmetry, lower the organizational cost of

the companies, and replace the structure of the vertically integrated organization. However, it was also mentioned that TPC is expensive now and as a result, excludes small farmers from the organic certification. In addition to this, regular certification assessment is also necessary to maintain the standard value chain. The study by Acosta et al.(2019) discusses the organic certification assessment in the organic coconut value chain. It focused on the certification process, value chain networks, governance structure including multi-stakeholder platform, policy challenges & options. The study by Dara Guccione et al.(2021), found that the yield of organic rice in Italy is not uniform, as some farmers reported that the yield of organic rice is lower and some farmers reported that the yield is average or higher as compared to the conventional rice yield, which increases the doubt of compliance to the organic standards and certification norms at production level. To avoid such disjuncture, the focus has been given to the implementation of two agronomic factors which are: the choice of rice varieties and the use of specific farming techniques to avoid the use of synthetic pesticides. Gender differences are a significant issue among value chain actors. The study by Kasente (2012) focused on gender differences in the organic coffee value chain in Uganda and suggested the need for gender equality in all stages of the value chain. The same can be dismantled by adopting a wide certification code by designing, implementing, and monitoring the value chain.

From the literature reviewed, the study found that the certification standards norms are different across borders, although, in most of the studies, strict compliance with global standards instead of voluntary standards is recommended. The study by Arora, et al.(2013) however mentioned the appropriate size of disjuncture between global standards and standards followed by the farmers can be determined through a participatory democratic system. There is a need for more interdisciplinary research covering various standards, certifications, and farm-to-fork, with contributions covering the whole supply chain between the agricultural system, and its socio-economic context. The study found that consumers often confused with organic certification logo with other similar terms like green products, eco-friendly products, and environmentally sustainable products (Mutserbaugh, 2005; Bhaskaran et al. 2006; McCarthy et al. 2016). More studies needs to explore the consumer knowledge and awareness related to logos used in certified organic products and how the same is differentiated from other non-organic certified products. From the review study, it is also found that different farmers may have different yields in the same cluster, and in such cases, strict compliance with the organic standard should be monitored regularly to avoid any fraudulent practices of farmers. Strict adherence to agronomic practices in production is

required to have uniformity in the yield as the price of organic products depends particularly on product and production practices(Dara Guccione et al., 2021; Kilian et al. 2005). Further, from the study it is also to be mentioned that, between conventional and organic farming, there exists a wide array of variables and interdisciplinary collaborative research between social and natural science can help policymakers address the complex question at different stages of conversion, certification, and labeling.

2.2.6.3 Value Chain Mapping

Mapping of the value chain covers the entire range of activities from input to output and involves three activities i.e., the flow of products, services, and information (M4P., 2008). Many authors contributed various dimensions of value chain mapping, focusing on various sectors and countries. The study by Lord & Tangtrongjita (2011) on the mapping of the organic value chain in EWEC discussed the horizontal and vertical linkages, information and support services, price differentials between organic and conventional vegetables, packaging, branding, and certification process. EWEC offers cost-efficient transport linkages between major commercial within and outside the corridors and economic corridors, enabling households and enterprises to link their value-adding downstream activities better. The study by Ríos Guayasamín et al.(2016) studied the flow of organic products in various municipalities of Rio de Janeiro in Brazil and identified three primary value chains that reach consumers. In the first municipality, a maximum of 86 products are distributed, and farmers have a stronger set of stakeholders, who share about 60-70% of the final value of organic products. The second municipality distributed a maximum of 104 products, and only 23-36% of the final value goes to the farmers. In the organic beef sector, a study by O'Donoghue et al. (2018) in Ireland identified the leakage of organic animals from the organic beef sector to the conventional sector (non-organic). The leakage confirms a sectoral concern for the beef sector in Ireland, and the same could imply for European policymakers about the effectiveness of the current incentives scheme and the designing of a new scheme.

From the study, it was found that the value chain of organic crops, particularly the organic vegetable sector needs an end-to-end organic chain as the products are being mixed with conventional chain. The farmer's share in the consumer prices majorly depends on the marketing channel they follow and in developing countries, middlemen/distributors control the organic value chain. A similar result was found in the studies by Abebe et al. (2022) and Das & Roy (2021) which shows a greater margin received by farmers in consumer price for

direct sales as compared to other marketing channels. To minimize the risk of direct marketing, organic farmers may use a wide range of market linkage activities like selling from vehicles, online orders, and weekly baskets to increase the demand utility of consumers.

The study also found that value chain leakage is a major concern that impacts the traceability of organic products and leads to chain underperformance. Most of the studies related to value chain mapping, like Das & Roy (2021); O'Donoghue et al. (2018); Ríos Guayasamín et al.(2016); Abebe et al. (2022); (Dan & Jitea, 2023) mentioned value chain leakage and found that the market intermediaries shared the majority of the margin in consumer price. Although direct marketing provides a better margin, there is also a risk associated with the volume of sales. Only a few studies, Lord & Tangtrongjita (2011);(Melo, 2021) mentioned that the existing organic value chain is well regulated with the value-added products and cost cost-effective chain distribution system is found to link producers and consumers. More study on this aspect is required across various organic crops to know the distribution pattern and to suggest various ways to control the value chain leakage.

2.2.6.4 Economic Analysis of the Value Chain

The study found that most of the articles related to analysis of cost and margin revealed that that the profitability rate of organic farming is high compared to conventional farming due to its price premium. However, the rate of profitability may differ across the products. The study Atreya & Kafle (2018) focused on the cost and margin of organic apples in Jhumla, Nepal, and price spread was discussed therein. A wide gap exists between farm gate price and consumer's price, and it was found that organic apple producers get only 16.77% of the shares of the price paid by the end consumer. The study by Eyhorn et al. (2018), found that the production cost in organic basmati rice cultivation is 45% lower and 105% more profitable than the cultivation of conventional basmati rice. It is suggested that smallholder farmers, in addition to cultivating organic basmati rice, should also focus on producing high-value crops cash crops like vegetables, fruits, and spices for the domestic market to enhance the household income. The study by Milić, et al. (2017) in organic raspberries in Serbia found that although the trends of yield and production are positive, they can be further increased with proper investment in all phases (production, processing, and distribution) and changes in the export market. Further, product packaging, design, and transportation should be improved, particularly for the export market. Contract farming is emerging as a viable option to enhance the profitability of organic products. The study by Mbapila et al.(2019) discussed

how institutional arrangements like contract farming or producers' cooperatives reduce transaction costs and increase the probability of participating in the organic food markets as compared to those not involved in contract farming for organic tomato and sweet peppers.

The study found that most of the studies related to the analysis of cost and margin made comparative analysis in conventional crops. The study found a lack of uniformity in the yield and profitability rate of different organic crops. The yield and margin mostly depend on various factors like production practices, demand for organic products, value procession, and availability of economic resources. The study by Mutei Kalibwani, et al.(2018) mentioned that organic-certified producers have a higher margin per acre than conventional producers of organic pineapple in Uganda. Similarly, Melo, (2021) in the organic rice value chain finds that yield in production is constant and farmers enjoy economy at is cost of production as in organic farming local resources are used. In contrast to this, the study by Abebe et al.(2022) mentioned that organic tomatoes in Lebanon are less profitable as the yield is 60% less than the conventional chain. Although organic products fetch high prices, it is not profitable to farmers when traded through market intermediaries. In many studies, the farmers' share is found to be low as compared to other chain actors. However, the study finds that the direct marketing approach is the best by which farmers can improve the margin in consumer price(Eyhorn, et al., 2018; Abebe et al.(2022). From various literature, the study also found that it is not always like farmers earn less margin when organic products are traded through market intermediaries. The study by Sahoo& Sarangi (2018) found producer's share is highest at around 40% when the organic turmeric is traded through various market intermediaries in the end-to-end chain. Most of the studies suggested measures like improvement in value processing, product upgradation, process upgradation, contract farming, and developing alternative ways like agri-tourism and cultivating high-value crops to increase farmer's net income.

2.2.6.5 Value Chain Up-gradation and Innovation

Value chain up-gradation is an important aspect to strengthen the organic value chain. Various studies emphasized farmers and other chain actors to upgrade their knowledge, technology, and products as per the demand of the market. Value chain up-gradation is done in the form of (i) Product upgrading, (ii) Process upgrading, and (iii) Functional upgrading to add value to the product/ service (Wang 2012; ADB, 2005). Product upgrading is done to bring new varieties of products; process upgrading is done by shifting to anti-season

vegetables and improving deep processing; functional upgrading to integrate the actors and to shorten the link between producers and consumers (Wang, 2012). Similar to this, the study by Das & Roy (2021) on the organic pumpkin value chain in India found that basic upgrading strategies (product, process, and market) are done mostly by farmers and market intermediaries mostly perform non-value-added (assembling, grading, loading, unloading) and necessary non-value-adding activities. Most of the time, the product is sold in the conventional chain where organic pumpkins are mixed with conventional products. The quantum and size of the value addition in organic crops depend on the consumer's willingness to pay, and the level of value-added**.** Upgradation strategy and innovation in the organic food value chain differ across the region and the sector. The study by Smadja & Muel (2021) discussed two types of value chains: production-oriented value chains and market-oriented value chains. The production-oriented chain is launched by extension service officers or research and development institutes, whereas the market-oriented chain is launched by stakeholders which are mostly processors or collectors. To ensure strong coordination across the chain, various upgrading strategies like contract practices, production support programs (financial support, technical support), and market support programs (facilitators, regulations, and information sharing). The study by McCarthy et al.(2016) focused on innovation, particularly in biotechnology, to strengthen the agri-food value chain to boost the demand for organic certified foods in China. The study by Hansika & Wijerathna (2021) emphasized on development of a short supply chain where the income of the farmers increased after joining the organic direct market. The study by Hernandez-Aguilera et al. (2018) emphasized the Relationship Coffee Model (RCM) to build long-term relationships between buyers and smallholders based on product quality. The study Prasertwattanakul & Ongkunaruk (2018) focused on vertical integration in the organic rice industry in Thailand and found that vertical integration helps to control the quantity and quality across the supply chain. However, the medium-sized company has a smaller economy of scale and less flexibility compared with large vertically integrated companies in Thailand. The study by Baker & Russell (2017) discussed the vertical integration of organic wheat producers with milling enterprises and artisanal bakeries. It was found that demand for value-added products like bread, beer, spirits, baked goods, and pasta, from locally grown wheat is increased and will attract other farmers, millers, and growers to enter the market. The study by Othman, et al.(2016) discussed the SRI (System of Rice Intensification) practices for organic rice in Kedah, Malaysia, and found that the value chain of the same is different from the conventional paddy value chain in terms of actors and middle man.

Value chain constraints and various opportunities to upgrade the chain are discussed in many studies. The study by Wang (2012) mentioned lack of consumer awareness in buying organic products, lack of access to the direct market, and lack of value-added products as major constraints in upgrading the organic vegetable value chain in Yengxian County, China. Various opportunities suggested are contract farming, development of market linkage with supermarkets, and collective action of organic farmers. Similarly, the study by Dan & Jitea, (2023) mentioned the lack of market due to low consumption of organic products as a major constraint in Romania. Low consumption may arise due to a lack of processing of organic produce and farmers are selling organic vegetables in fresh form. Various constraints faced by chain actors (farmers, wholesalers, and retailers) are discussed in the study by Das & Roy (2021) by using one-way ANOVA. It was found that the mean score of constraints like buyer's trust in organic products, low yield, inadequate quality standard, seasonality of organic crops, policy support, lack of processing activities, and packaging and labeling is different with actors involved in the same value chain.

The study found that particularly for the organic vegetable value chain in developing countries has a weak value chain structure as products are sold in fresh form and without any value addition (Abebe et al., 2022; Das & Roy 2021; (Dan & Jitea, 2023). The value addition activities are mostly confined to basic activities like assembling, grading, storage, loading, transportation, and without any value processing. Similarly to this, Wang (2012) found that the processing functions in the value chain are missing as most of the farmers are selling vegetables in fresh form. The study found that many authors suggested various strategies to improve the value processing in the chain and to upgrade the value chain. Strategies like contract farming, improvement in production, and market support systems are suggested by (Smadja & Muel, 2021). In line with this, Wang (2012) also suggested contract practices, market linkage with supermarkets, and collective action of organic farmers as various opportunities to upgrade the chain. The study also found that lack of consumer awareness, lack of market for organic produce, and lack of value-added organic products are major constraints in the chain.

2.2.6.6 Governance Structure of the Value Chain

The governance structure associated with supply chains and value chains in developing countries can be classified into four categories.

- Market Governance Structure.

- Relational Governance Structure.
- Farmer's Association – based Governance Structure.
- Outgrowing Scheme based Governance Structure.

Market based governance structure characterised by one time and unrepeated transaction between buyer and seller. No formal relation is established, and little information is exchanged among actors(Williamson, 1985). In a market-based governance structure, buyers have no control over production, and the basic governing mechanism is pricing. Relational governance structure is characterized by the exchange of information, mutual trust, and the presence of informal contracts between parties, which are established by prior experience and relationships (Gibbons et al., 2010). Farmer's Association-based structures are formal and defined by long- term contracts. Farmer Association provides better market linkage to its member farmers and improves smallholders income and capacity building (Wennink & Heemskerk, 2006). Lastly, the outgrowing scheme structure is characterized by contractual agreement where firms assure supply of input and credit to farmers. The firm or buyer has control over production and quality of the output(Baumann, 2000).

The governance structure of the chain covers relationships, trust, rules, and regulations among the chain actors (Kaplinsky & Morris 2001). Both informal and formal rules & and regulations may exist that govern the value chain and are considered important to build supporting infrastructure and services to develop the chain (Bhattarai *et al.*, 2013). A strong governance structure is paramount to having a regulated value chain. The study by Steinnes, et al., (2019) in organic salmon in Norway revealed that the value chain of the same sector is highly regulated and is characterized by strong governance at the farm level. It was also found that compared to the conventional salmon value chain, organic salmon performs better in terms of economic and environmental sustainability as a whole. Similarly, gender equality in the chain can also be encouraged by various policies in the governance structure. In the study by Bullock et al. (2018) in contracting norms in organic spice certification in Tanzania, it was found that although contracting reduces the transaction cost in the value chain as compared to conventional trade, however, contracting does not provide significant opportunities for women in a married household. The study also emphasised using code within organic certification to foster more significant gender equity in employment and production activities to support gender equity in the horticulture and organic sector in East Africa. However, the study by Lyon et al. (2010) revealed that fair trade organic agriculture

can provide a significant earning boost to women if they are registered as farm operators and have greater access to network benefits and greater control over farm practices. The government may play a vital role in designing a good value chain for equal distribution of power and relations. The study by Ha et al.(2012) focused on the involvement of provincial and district governments will have greater legislative enforcement over contract arrangements between value chain actors to implement nature land organic certification in shrimp-mangrove production. The study by Sanders et al. (2016) focused on that although the organic market in European Union growing rapidly and higher added value is created in the organic supply chain as compared to conventional. However, it was found that farmers capture a small proportion of added value and depend mainly on the structure and characteristics of the value chain, such as level of integration and power relations between market players. It was suggested that investment in quality aspects, product differentiation, and increased consumer interest in organic food will contribute higher value-added to the organic products.

The distribution of the income share among value chain actors is not even. In the study by Yan et al.(2017) found that farmers are in the market governance segment of the value chain in-wall nut sector in South China. Lead firms i.e., supermarkets are price setters and determine the value distribution for various actors in the chain and farmers received a smaller share as compared to the downstream actors. In the study by Kilian et al.(2005) it was found that consumer price of organic products is higher in the USA than Europe due to the involvement of large food companies and high concentration on the wholesale level in the US than in Europe. It was also found that the price distribution in the value chain is uneven, and favouring the retail and wholesale sectors instead of the production sector.

Risk management is also an integral component in the governance structure of the value chain. The study by Munteanu (2014) discussed the risk management of organic products in an online platform and suggest overall improvement in the value chain of the organic market by increasing transparency in the market. Furthermore, to increase efficiency, the risk assessment framework prepared by an online trading platform can be a tool to increase the consumer trust level by providing accurate information about the organic products traded on the platform. The study by Asli et al.(2017) discussed the factors limiting the competitiveness of the Chinese organic value chain. Various factors like lack of knowledge and production capacity of producers, unequal benefit sharing among stakeholders, multi certification approach are the major factor that hinders the competitiveness of the value chain.

From the review of various literature related to governnce structure, it was found that both formal and informal rules and regulation may exist in value chain (Kaplinsky & Morris 2001; Bhattarai *et al.,* 2013). However, organised market requires highly regulated and strong governance structure (Steinnes, et al., 2019). From the review it was also found that distribution of income, power relation, share in the consumer price is uneven across the chain actors and country. .

2.2.6.7 Producers Organization

Producers' organization plays a crucial role in strong upstream and downstream value chains. The study by Groot Kormelinck et al. (2019) related to producers' organizations in Uruguay, found that producer's organizations in the organic value chain are responding to the market incentives, whereas POs in the conventional value chain are responding to public incentives. In the study by Garming et al. (2011) on Farmer's Community Enterprises in the form of a collective marketing company (Bana Beni) for organic bananas in Bolivia and a new market channel developed to supply organic bananas to the public-school nutritious program. From the review, it was found that investment in human, physical, and social capital at the farm household and enterprise level led to a significant positive impact on the financial capital of the farmer. Major threats are a lack of new markets and issues in the production technology of organic bananas. Producer organizations play a key role in strengthening the value chain, particularly in the agricultural value chain.

2.3 Value Chain of Organic Crops in India

To know the quantum of publication related to the value chain of organic crops in India, the following inclusion criteria are used.

a. Search word: "Value Chain" or "Value Chain Analysis" AND "Organic" in the title of the article or thesis.
b. Date Range: 1990 to 2023.
c. Search Database: Google Scholar and ShodhGanga (a reservoir of Indian Thesis).
d. Country: India
e. Language: English
f. Literature Type: All literature published in the value chain of the organic food sector in India, excluding review articles.

Using the aforementioned inclusion criteria, a preliminary search was made by using the advanced search option of Google Scholar, and 150 articles were found. Articles published in a foreign country and other fields are excluded from the same. After the screening, only fifteen articles on the value chain of various agricultural or horticultural commodities were found as per the mentioned inclusion criteria. A similar search was done in ShodhGanga (a reservoir of Indian Thesis), and only one thesis was found and the same related to the value chain development of organic pineapple in Nagaland, India.

Table 11: ***Showing Literatures Published Related to the Value Chain of Organic Crops in India***

Sl. No.	Authors Name	Sector Covered	State/Region
1	(Panghal & Nath, 2023)	Policy Implementation	India
2	(Shijagurumayum & Lakshminarayan, 2021)	Organic Black Rice	Manipur
3	(Das & Roy,2021)	Organic Pumpkin	Assam
4	(Das & Roy, 2023)	Organic Pineapple	Assam
5	(Arora et al.2013)	Organic Non-Basmati Rice	North India
6	(Sahoo & Sarangi, 2018)	Organic Turmeric	Odisha
7	(Deka & Goswami, 2022)	Organic Tea	Assam
8	(Sandeep & Sharma, 2023)	Organic Tea	Assam
9	(Singh et al., 2021)	Organic Chili	Northeast India
10	(Yadav et al., 2018)	Organic Large Cardomom	Sikkim
11	Kulkarni & Shahid (2021)	Policy Implementation	Sikkim
12	(V et al. 2021)	Organic Horticulture	Kerela
13	(Sherief, 2021)	Organic Banana	Kerela
14	(Ao et al.,2018)	Organic Pineapple	Nagaland
15	(Reddy, 2018)	Policy Implementation	Assam, Arunachal Pradesh and Mizoram

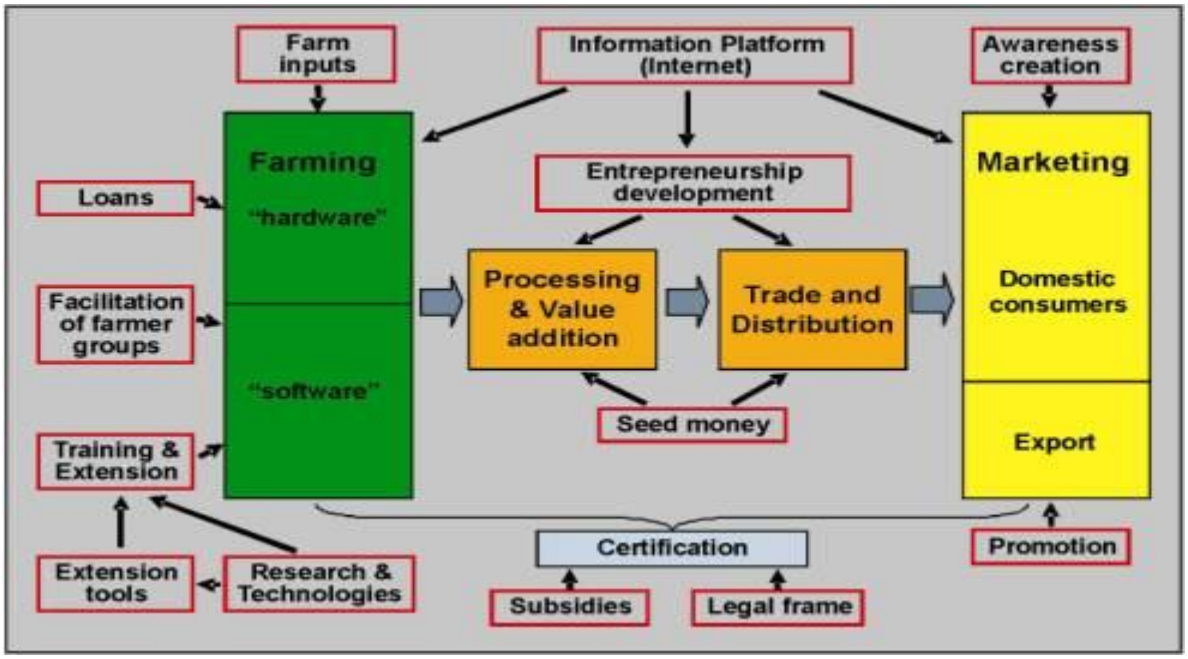
Source: Compiled by the author.

From the review, two articles were found that were published related to the value chain of organic tea in Assam(Deka & Goswami, 2022); (Sandeep & Sharma, 2023). Three studies have been published related to policy implementation. The study by (Reddy, 2018) performed an impact evaluation study of the Mission Organic Value Chain Development Scheme and the study by Kulkarni & Shahid (2021) is focused on the organic mission in Sikkim. The study by Panghal & Nath (2023) discussed various constraints faced by farmers and strategies to improve logistics and supply chain management. The study by Arora et al.(2013) focused on the Global Value Chain (GVC) for organic basmati rice in North India and found that there is some disjuncture between official standards of GVC and actual practices by farmers. The disjuncture between these two should be nurtured to give farmers more benefits and

maintain farm ecology. Sahoo & Sarangi (2018), identified three marketing channels in the value chain of organic turmeric in Odisha. The marketing efficiency of channel II (producer-big trader-processor-retailer-consumer) is found to be higher as compared to channel I (includes small traders) and III (through KASAM), which was 0.67. In the constraints from the farmer's side, the high cost of labor is ranked first, followed by a personal obligation with traders. Studies by Deka & Goswami(2022) and Sandeep & Sharma (2023) focused mainly on the value chain development of organic tea in Assam and suggested various policy measures to develop the same. Singh et al., (2021) found that organic chili cultivation in north-eastern hilly region is profitable as compared to conventional, and proper technological intervention is required to benefit the farmers. In the value chain of organic large cardamom in Sikkim, inappropriate drying techniques, the absence of marketing infrastructure, and the limited overseas market are major obstacles to exploring the premium organic market (Yadav et al., 2018). Kulkarni & Shahid (2021), after examining and understanding various constraints faced by the farmers, the system maps were created. It is suggested that service design can be a solution to make the whole organic farming system of Sikkim sustainable. V et al. (2021), in their study, discussed opportunities and constraints in organic horticulture in Kerala, and it was found that organic fruits and vegetables have huge potential inside and outside Kerala, and value-addition centers need to be developed to capture the organic market. Value chain mapping of certified organic bananas in Kerala is discussed in the study by Sherief (2021), which finds poor awareness among consumers about PGS certification as a major constraint followed by reduced yields. Only two studies, Das & Roy (2021); Das & Roy (2023), the authors of the present study were found related to of value chain analysis of organic pumpkins and organic pineapples in Assam. The study by Ao et al.(2018) discussed the value chain in the marketing of organic pineapple in Nagaland. Products are categorized into four categories according to the harvesting stage which are H1 (fully matured but no color development), H2 ($1/8^{th}$ color development), H3 ($1/4^{th}$ color development), and H4 (1/2 color development). In similar to these, packaging containers are categorized as P1 (Wooden boxes), P2 (Bamboo boxes), P3 (CFB boxes), and P4 (used cartoon boxes). It was found that the H4 categories had the best physiochemical qualities, and P3 (CFB boxes) had higher fiber contents, shelf life, sweetness, and lower post-harvest. The best combination in terms of benefit-cost ratio (BCR) is H1P4. The impact evaluation study of MOVCD in Assam, Arunachal Pradesh, and Mizoram by Reddy(2018), discussed the adaptability and scenario of the scheme and suggested various measures for a strong value chain. Various recommendations such as technological upgrades, infrastructure development, capacity

building, national-level insurance agency, market and brand development, and timely financial assistance are of utmost importance to strengthen the existing chain. Moreover, as the organic industry in Assam is in the infant stage with a very weak value chain, (Reddy, 2018) suggested using the following model for policy intervention for market development as shown in below figure.

Figure 7: ***Showing Model for Policy Intervention for Market Development***



Source: B.K. Sikka, Sapna A. Narula and M.S. Jairath as cited in (Reddy, 2018).

From the review, it was found that most of the studies related to the organic food value chain in India are confined to analyazing constraint faced by farmers and other market intermedaires in the value chain (Kulkarni & Sahid, 2021; V et al. 2021; Sherief 2021). Moreover, most of the studies are found to be crop specific and not firm specific. No significant studies were found related to comparision of organic firms or FPCs in the literature reviewed. Various studies related to value chain analysis covers some parameters and confined to value chain mapping, identification of constraints and opportunities and margin (Das & Roy, 2021; Sahoo & Sarangi, 2018). However, no significant study by including all parameters of value chain like network structure, upgradation strategies governance structure and degree of value addition is found.

2.4 Research Gap

1. India is the highest organic producer in the world, but only a few literature (fifteen) have been published in the context of the value chain analysis of various organic agricultural and horticultural commodities.
2. The study by Reddy (2018) in the impact evaluation study of MOVCD evaluates the scheme in terms of reach and implementation of the scheme. However, value chain analysis of organic crops under this scheme has not been performed, and more research studies and surveys on various organic crops in different agroecological zones have been suggested.
3. Various studies related to value chain analysis covers some parameters and confined to value chain mapping, identification of constraints and opportunities and margin . However, no significant study by including all parameters of value chain like network structure, upgradation strategies governance structure and degree of value addition is found.
4. Most of the studies are found to be crop specific and not firm specific. No significant studies were found related to comparision of organic firms or FPCs in the literature reviewed.
5. No significant studies were found related to the value chain analysis of organic non-basmati rice, organic red rice, and organic turmeric in Assam.
6. No significant studies were found to compare the value chain of government and non-government organic FPCs in India or Assam.

2.5 Research Trends in Agri-food Supply Chain during COVID-19

As the COVID-19 pandemic spread rapidly to six continents, many countries have declared a state of health emergency and lockdown to prevent the spread of novel coronavirus SARS-nCoV-2. As of July 13, 2021, with confirmed cases of more than 186.6 million people globally, this pandemic touched every sector and directly and indirectly hurt the world economy (WHO, 2020). COVID-19 has had a diversified and dynamic impact on the food and agricultural sector, particularly in the supply and value chain. The flow of products and services from producer to consumer is disrupted substantially as demand and supply are mismatched. Considering the impact of COVID-19 on the Agri-food value chain, scholars and academicians have published many articles covering the various aspects related of the

food value chain. This section in addition to the main topic, makes an attempt to know the trends of research during the pandemic on the agri-food supply chains.

2.5.1 Data Source

The present study considers articles included in the Scopus database from January 1, 2020, to July 10, 2021. In the present study, the Scopus database is used as compared to Web of Science, Google Scholar, and PubMed, as the same covers a wider journal range and helps both in keyword searching and bibliographic analysis compared to WoS (Falagas et al., 2008). For citation analysis, Scopus offers 20% more coverage than WoS, whereas Google Scholar offers inconsistent results. PubMed is generally used for biomedical research (Falagas et al., 2008).

2.5.2 Search Strategy

An initial search was made in the document search option of the Scopus database with "COVID-19" OR "CORONAVIRUS" OR "NOVEL CORONAVIRUS" OR "COVID" AND "VALUE CHAIN" in the title, keyword, and abstract of the article. A total of 173 pieces of literature were found in the first search in various areas like manufacturing and industry, computer science, environmental science, medicine, stock market, and human capital. Inclusion criteria for the study are as given: *(a) Document Type:* article, review, note, conference papers, book, book chapter, conference review, editorial, erratum, and short survey. *(b)Publication stage:* Final and article in press *(c) Language*: English *(d) Source type:* journal, conference proceeding, book, trade journal, and book series. *(e) Country:* All the countries appeared in the search list. After reading the title, keywords, and abstract, only literature published in the domain of the agri-food value chain is considered for the study. Thus, a total of 41 research articles were selected to conduct a systematic review of the literature.

2.5.3 Major Research Area in Agri-food Supply Chain During COVID-19

Four major research areas (Food Security and Crisis during the Pandemic; Food Price Fluctuations; Disruption in Agri-Food Value Chain and Resilience Strategies) are identified, where authors from various regions published articles on various aspects of the agri-food supply chain during the COVID-19 pandemic. The four major research areas along with the specific areas and authors name are shown in the following table.

2.5.3.1 Food Security and Crisis during the Pandemic

Food security was a major concern during this pandemic, and various nations implemented policies to ensure an adequate supply of food to its people. As people's movements are restricted, the same is causing food crisis and nutrition, particularly for women, children, and migrants and focus on integrating health and agri-food policy as a tool against outbreak and food insecurity (Swinnen & McDermott, 2020; Patterson, et al., 2020). In the African region, this pandemic is causing the threat of food crisis, especially among poor people (Nchanji, et al., 2021). However, some countries with a well-integrated and coordinated value chain are self-sufficient in food grain production. The study by Brewin (2020), revealed that Canada is in an advantageous position in terms of natural endowments to produce grain and oilseeds and to process these crops and transport them to the consumer in Canada and the world. To ensure food security during COVID-19, a resilience policy is taken to strengthen the domestic rice value chain in West Africa, which faces constraints with technology, finance, and coordination (Arouna, et al., 2020). The study Woertz (2020) focuses particularly on food security in Arab Gulf countries for migrants' labor as they are trying to minimize import dependency on food items. In contrast, the study by Hirvonen et al. (2021) in Addis Ababa revealed that the food standard food security indicator (HDDS) has not changed from September 2019. However, the food consumption pattern is changed towards staple food and away from vegetables.

2.5.3.2 COVID-19 and Food Price

Irregular supply due to containment measures taken by nations caused demand-supply imbalance, which the same led to price fluctuation in various commodities. The study by Coluccia et al. (2021) finds that fresh and perishable products whose production or harvest took place during the first wave of COVID-19 are affected much as compared to storable products. The study by Ceballos et al.(2021), discussed the price change in wheat and tomatoes and its impact on farmers in Haryana, India. In the comparison between wheat and tomatoes, it was found that the value chain of wheat is much integrated and is minorly disrupted by COVID-19 as wheat farmers can sell the same at the prevailing guaranteed price. However, tomato farmers sold their products at a meager price and were able to obtain only one-third of the expected revenue from one acre. The study by Agyei et al., (2021) discusses the COVID-19 outbreak that leads to an increase in the food price and suggests

adequate support to industries in the value chain will improve food availability and bring price stability.

2.5.3.3 COVID-19 and its Impact on the Agri-Food Value Chain

The pandemic has a devastating impact on the agri-food value chain as it disrupts the flow of products from producers to consumers and has a negative impact on farmer's income and livelihood (Sunny, et al., 2021; Kubo, et al., 2021; Huang, 2020; Swinnen & Vos, 2021). Smallholder farmers, to mitigate risk are diversifying their business, seeking alternative employment opportunities, and reducing production costs to cope up with the crisis (Belton, et al., 2021). The studies by Belton, et al., 2021; Sunny, et al., 2021; Giannakis, et al., 2020; Kumaran, et al., 2021; Aura, et al., 2020; Ferrer, et al., 2021, mainly discuss the impact of the pandemic on the value chain of the aqua sector. The value chain of aquatic food has a devastating impact, including reduced income, sudden illness of small-scale fishery farmers, labor crisis, transportation, and low consumer demand. In India, the government is focus is taken by Government to mitigate the impact by declaring fisheries and aquaculture as essential sectors and monetary package to strengthen the value chain of the same (Kumaran, et al., 2021).

The livestock sector, which contributes nearly 40% of agricultural output in developed countries and 20% in developing countries, is also severely affected (FAO, 2021). The study by McEwan et al. (2020) discussed the impact of COVID-19 on the Canadian pork industry. It revealed that labor shortage, the shutdown of processing plants, and trade interruption with the USA and the rest of the world are major concerns. The studies by Temesgen et al. (2021) and Biswal et al. (2020) revealed that the income of farmers engaged in the livestock sector decreased significantly and suggested that fiscal and monetary policy implemented by the government should be continued. In the fruits and vegetable sector, the impact is much severe for perishable commodities, compared to storable products and causing huge losses to the farmers (Khan & Siddiquei, 2021; Nchanji, et al., 2021; Loker, 2020). In the study by Nandi et al. (2021) all the actors in the value chain of groundnut in South India are affected, and COVID-19 created a double burden on farmers by disrupting farm production on one hand and decrease in diet diversity on the other hand. The study by Solomon et al. (2020) found that the entire value chain of the sugar industry, i.e., sugarcane, sugar, molasses, ethanol, and their subsequent marketing and export are affected by COVID-19 and suggested strategies like increased mechanization in the grower's field, diversification, ethanol blending, and

value addition etc, are hereby to strengthen the value chain and to overcome unforeseen adversities. The impact on the small enterprise is huge as compared to large-scale enterprise which normally has a higher level of vertical coordination among value chain actors (Van Hoyweghen, et al., 2021). The study by Francesconi et al. (2021) found that in Southeast Africa, many new agricultural cooperatives with large membership sizes could not countervail market- disruptions and turned dormant during the pandemic. The study by Kubo et al. (2021) focuses on the disruption of cross border traders between China and Myanmar fruits and vegetable value chain. It states that the border trade was abruptly curtailed due to pandemic and the same leads to bearing huge costs and debts as the governance structure of the same is controlled by brokers.

2.5.3.4 Resilience Strategy for Recovery and Strengthening of the Value Chain

The resilient strategy to strengthen the agri-food value chain varies across the nation depending on the nature of containment measures taken. To prevent major disruption, many studies focused on technological advancement and digital transformation in value chain up-gradation to coordinate among various chain actors. The study by Snow et al. (2021) revealed the resilience that emerged from high technology and well-connected chain actors and government policy that helped Australia and New Zealand cope with the pandemic. The study by Amjath-Babu et al. (2020) in Bangladesh suggests that appropriate farm mechanization, innovative labor management tools, logistics, adequate credit facilities, digital extension services, enhanced storage space, and innovative and robust marketing mechanisms is required to strengthen the value chain. Resilient strategies also differ by the size of the organization. The larger corporate farming system with vertical market integration and a high level of coordination within the supply chain and smallholder or subsistence farming systems with the intention of domestic consumption are less impacted by COVID-19. However, medium and small entrepreneurial farmers with less control over upstream and downstream supply chains show less adaptive capacity during this pandemic. Resilience strategy includes the development of alternative value chains, change in food and agricultural products development systems, and exponential use of digital to communicate (Lopez-Riduara, et al., 2021). Various constraints such as labor crisis, low-value addition, and outdated technologies are identified to strengthen the fruits and vegetable value chain in Brazil. Entrepreneurship and innovation in the private food supply chain, contract farming, supermarket procurement, and private index insurance products, when the price falls under the minimum threshold, can be some resilient strategies to overcome obstacles in the food value chain and to minimize the

price shocks (Ceballos, et al., 2021; Swinnen & McDermott, 2020). Three pathways to support future food systems: value chain, climate change and nutrition, and addressing structural inequalities among smallholder livelihood is suggested by (Davila, et al., 2021). In Pacific Island countries, COVID-19 has a devastating impact on the economy and a study by Jha et al. (2021) finds that GDP can change from -7% to +6% in Senegal and -8% to +9% in Burkina Faso. Timely resilient strategy by Government like promoting financial inclusion, value chain upgrading, using of social networks, subsidized agricultural inputs, fair wages to all chain actors can be used to mitigate the impact (Ferrer, et al., 2021; Nchanji, et al., 2021; Patterson, et al., 2020). Although the COVID-19 pandemic has had a drastic impact on the world economy, the same is not yet a global food crisis, and with proper coordination between global and local food chains, food security can be ensured for all countries (Tittonell, et al., 2021).

Table 12: ***Showing Major Research Area, Specific Area with the References.***

Focused area	**No. of article**	**Specific area**	**Reference**
Food Security and crisis during the pandemic	8	i. Strengthening the rice value chain in West Africa.	(Arouna et al., 2020)
		ii. Food security in Arab Gulf countries for migrant's labor	(Woertz, 2020)
		iii. Change food consumption.	(Hirvonen et al., 2021)
		iv. Food security, nutrition, health and poverty.	(Huang, 2020)**;**(Swinnen & McDermott, 2020)**;**(Nchanji et al., 2021)**;**(Patterson et al., 2020)**;**(Brewin, 2020)**.**
Food Price fluctuation	4	Focused on the impact of COVID-19 on food price of various commodities	(Hirvonen, et al., 2021)**;**(Ceballos et al., 2021)**;**(Coluccia et al., 2021)**;**(Agyei et al., 2021)**.**
Impact of COVID-19 and disruption in the agri-food value chain	21	i. Disruption in farmers livelihood and income	(Belton et al., 2021)**;** (Sunny et al., 2021)**;**;(Giannakis et al., 2020);(Arouna et al., 2020);(Temesgen et al., 2022).
		ii. Disruption in global trade	(McEwan et al., 2020);(Kubo et al., 2021)
		iii. Demand and supply gap	(Swinnen & Vos, 2021)
		iv. Disruption in agri-food value chain (in general)	(Huang, 2020)**;** (Nandi et al., 2021);(Khan & Siddiquei, 2021)**;**(Solomon et al., 2020)**;**(Loker, 2020)**;** (Nchanji, et al., 2021)**;**(Kumaran et al., 2021)**;**(Biswal et al., 2020)**;**(Aura et al., 2020)**;**(Telukdarie et al., 2020)**;**(Ferrer et al., 2021)**.**
		v. Impact on small holder's value chain	(Van Hoyweghen et al., 2021)**;** (Francesconi et al., 2021)

Table 12 (Continued)			
Resilience strategy to recover and strengthen the value chain	19	i. Focus on technology advancement	(Snow et al., 2021)**;**(Lopez-Ridaura et al., 2021)**;**(Ceballos et al., 2021)**;** (Amjath-Babu et al., 2020)
		ii. Emphasis on market integration	(Lopez-Riduara, et al., 2021)
		iii. Focus on entrepreneurship	(Swinnen & McDermott, 2020)
		iv. Global Food Chain	(Tittonell et al., 2021)
		v. Emphasis on social networks and digital transformation	(Tittonell, et al., 2021)**;** (Ferrer, et al., 2021)**;** (Quayson et al., 2020)
		vi. Focus on strengthening Government policy	(Nchanji, et al., 2021)**;** (Loker, 2020)**;**(Vos & Cattaneo, 2021)**;** (Christiaensen et al., 2021)**;** (Snow, et al., 2021)
		vi. Emphasis on value chain up-gradation and structural change	(Patterson, et al., 2020)**;** (Arouna, et al., 2020)**;**(Cordeiro et al., 2021) (Kumaran, et al., 2021)**;** (Solomon, et al., 2020)**;**(Davila et al., 2021)**;**(Jha et al., 2021)**.**

Source: Compiled by author

2.6 Chapter Summary

This chapter reviews various available literature related to concepts of value chain in agri-food sector and literature published particularly related to the value chain of the organic food sector in a global context and Indian context by using the Systematic Mapping approach. The value chain for organic crops in India is still in its infancy, and the majority of the studies are focused on economic analysis of organic farming, awareness, and problems faced by organic growers in India. The chapter also presents the research gap that researchers could fil. From the research gap, objective is identified and the same is presented in chapter three. The next chapter (chapter three) deals with the research methodology of the study.