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Research Paper: Identification and Development of the Cluster of an Agricultural Businesses Based on Participatory Rural Assessment in Khanghah Vosta Village

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ABSTRACT

Purpose: The horticulture sector as one of the subcategories of agriculture is considered one of the most vital sectors in Iran due to the production of high nutritional-value products and its foreign exchange potential. In this regard, agricultural business clusters present a suitable strategy for transferring knowledge to gardeners, reducing their costs, and improving their performance. This study aims to identify and develop an agricultural business cluster based on participatory methods in Khanghah Vosta village.

Methods: The study followed a qualitative research paradigm using grounded theory research methodology. The studied poulation includes rural gardeners of Khanghah Vosta, horticultural researchers from the agricultural jihad organization of Songhor & Kulyaei County, and the horticultural business services providers. Participants were selected using purposeful sampling based on distinct types.

Results: The results showed that residents of Khanghah Vosta, engage in six different types of businesses. Among them, grape horticulture emerged as the most prominent and were selected as the core of the grape business cluster in the village. According to the value chain analysis, the major challenges included insufficient knowledge of pruning, orchards nutrition, and orchards scaffolding. These issues have led to reduced productivity among grape growers in Khanghah Vosta.

Conclusion: The strategic development plan for this business focus on improving the productivity of local gardeners. An actionable implementation plan was designed to support this development.

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1. Introduction

Agriculture is one of the key sectors of Iran's economy, which has an essential contribution to employment, meeting food needs, gross domestic product, and non-oil exports. The horticulture sector as one of the subcategories of agriculture is considered one of the critical areas of agriculture in Iran due to the production of high- nutritional-value products and its foreign exchange earnings (Moradi et al., 2015).

Among the types of horticultural products, grapes are ranked third in production in Iran with 3.4 million tons and a share of 13.9%. In Iran, there are more than 300,000 hectares under cultivation grape and the total production of Iran in the crop year of 2020-2021 is equal to 3,389,827 tons. Kermanshah province, with a production amount of 111829 tons and a cultivated area of nearly 10000 hectares, is among the top 10 grape-producing provinces in Iran (Statistics of agricultural products, 2021).

Songhor & Kulyaei County holds a significant share with 1465 hectares of grape cultivation. However, the average yield of blue grapes in Songhor & Kulyaei County including Khanghah Vosta village is about 7 tons per hectare, whereas the national average in Iran is about 14 tons per hectare (Statistics of agricultural products, 2021). Furthermore, the global average grapes yield exceeds 11 tons per hectare (FAOSTAT, 2022).

An agricultural business cluster is seen as a suitable strategy to transfer knowledge to gardeners, reduce their costs, and increase their performance.

An agricultural business cluster refers to a network of producers, agribusinesses and institutions engaged in the same agricultural sector or sub-sectors of agricultural related industries with common challenges and opportunities and create value-networks for the desired product (Heidari, 2019).

Participating in clusters offers numerous advantages for business units including: Increasing business productivity, business specialization, cost reduction, branding, networking and access to shared resources and use, market access and marketing, and access to shared information (Heidari et al., 2018; Hoffman et al., 2014).

To successfully develop agricultural business clusters, analyzing and strengthening the business value chain is essential (Organization of Small Industries and Industrial Towns of Iran, 2023). The value chain consists of various parts such as; it consists of research and development, branding, design, production, distribution, marketing, sales and after-sales service (Meng & Ye, 2022).

To prevent project failures-often caused by a the lack of accurate information about the target community and inadiquate stakeholder cooperation- this research utilizes participatory rural techniques at different stages of business cluster development. These stages include:

- Determining the priority business of the rural (Determining the agricultural business cluster with priority in the rural),
- Analyzing the business value chain and extracting its problems,
- Presenting a business development strategy
- Designing an executive action plan

Thus, the purpose of this research is to identify and develop an agricultural business cluster based on participatory methods in Khanghah Vosta village.

2. Literature Review

According to the investigations carried out in this research, there has been limited research and action regarding agricultural business development and problem-solving using participatory methods and agricultural clusters. More previous studies have focused on the conditions of creating clusters and their impacts on businesses but have paid little attention to the participation of local communities and stakeholders during key stages of cluster development, including: identification of businesses, value chain analysis, problem-solving and extraction of missing links, formulation of strategy and solution, presentation of the operational plan and finally implementation.

Below, several relevant studies onn business clusters summarized:

The research results of Musso & Francioni (2015) showed that the agricultural-food cluster had attracted many tourists to rural areas by producing various types of beverages in rural by small domestic companies, as well as producers active in the said cluster, beverages. They also export their products to foreign and international markets.

Sharma & Anupam (2014) indicated that cluster development could be a powerful tool for agricultural development. By joining agricultural cluster through collaborating with related businesses, farmers and small and medium businesses (SMEs) can increase productivity and access to information, and business branding, attract government support, create synergy and access to public goods, and faster innovation through cooperation with research centers.

Gagne et al. (2010) that strong early support for nascent industrial projects, removing obstacles for industrial clusters, and fostering regional clustering initiatives could significantly boost small and medium-sized enterprise's contribution to employment and economic development.

Roy and Thorat, in a study titled "Factors affecting the success of Maharashtra grape cluster in India," showed that focusing only on production is a risk. Factors such as interaction between all members of the cluster, use of new knowledge through communication with agricultural and research universities, government policies through giving low-interest loans, and product marketing are known factors of the success of this cluster (Roy & Thorat, 2008).

Heidari (2019), in a research entitled "Designing a model for the creation and development of a horticultural products business cluster with an emphasis on processing industries in Kermanshah province" showed that the most important consequence of the development of the horticultural products processing cluster is economic development and the development of active businesses in the cluster. The results showed that business clusters provide specialized and appropriate training to businesses. Access to inputs and tools needed for businesses will be provided, and their costs will be reduced with the established networks, which also help to complete the value chain of businesses and manufacturing products.

In the similar vein, Mariyudi et al. (2022) studied the "Agribusiness-based MSMEs cluster business development model during the Covid-19 pandemic" in Indonesia. They highlighted the sustainability strategies, innovation types and their impact on business performance, sustainability and cluster survival during the pandemic.

Safari et al. (2015) found that the structure of clusters on entrepreneurship in clusters has a significant effect. Also, based on the results of entrepreneurship in industrial clusters on the increase of business unit innovation, knowledge transfers between industrial cluster enterprises, and reducing the operational and investment costs of the units located in the industrial cluster has a significant effect.

Kurd and Khashi's (2014) in "Identification and prioritization of the factors of creating an industrial cluster using the method of network analysis process (case study: Saravan date industrial cluster)" identified six factors: geographical concentration, environmental conditions, infrastructure, strategy/structure, inter-enterprise communication and demand conditions. Among these, geographical concentration and inter-company communication are the most and the least factors of creating the date industrial cluster in this region.

Izidi and Mosleh Shirazi's research (2012) in "Investigation of the economic effects caused by the development of industrial clusters (A case study of the rose cluster and Persian herbs and medicinal plants)" showed that the implementation of the cluster development program through the application of policies such as reaching new markets to sell products, creating a supply network for suitable raw materials, a distribution network and a sales network in the cluster, building trust, training and increasing the level of technology or using new devices has been able to influence the development of the cluster and complete its value chain and has finally created an export approach in the Meimand cluster.

Overall, research shows that agricultural business cluster development can positively impact businesses by enhancing development, access to knowledge and information, access to appropriate technology, marketing, building trust between businesses, specialization of businesses, economic development and agricultural development, social-cultural development, human development, attracting tourists and government support to the region.

Also, the analysis of the research literature showed that to form business clusters, factors such as geographic concentration, the interaction between cluster members, environmental factors, and suitable infrastructure, demand conditions, government policies, and communication with the scientific and academic sector are effective.

However, existing studies largely take a top-down approach, often overlooking stakeholder participation in selecting businesses for clustering, planning, implementation, and evaluation.

Therefore, this research focuses on identifying and developing an agricultural business cluster through participatory methods in Khanghah Vosta village.

Accordingly, the research seeks to answer the following questions:

What is the value chain of the selected business cluster?

What are the problems within the value chain of the selected business cluster?

What is the solution or development strategy of the selected business cluster?

What is the executive plan for the development of the selected business cluster?

3. Methodology

This research has used a qualitative approach and grounded theory research method. The community studied in the research includes 29 people from the villagers and gardeners of the Khanghah Vosta, experts from Agricultural Jihad Organization and business service providers who were chosen using the purposeful sampling method of the Typical Case Sampling.

At first, the researchers visited Khanghah Vosta and engaged with the villager and three members of the village councils. Semi-structured interview techniques, brainstorming, and field observation were done to identify active businesses in the village

Next, using the prioritization technique, the six main businesses of Khanghah Vosta were identified and prioritized with the participation of three experts from the Agricultural Jihad organization of Sonqhor & Kulyaei county and four experts from Khanghah Vosta. This was done using specific indicators, including: employment potential, degree of impact on rural development, compatibility provincial advantages, business development potential, capacity to foster cooperation, availability of stable markets and minimal environmental damage.

After determining the primary business of Khanghah Vosta, he research continued with the value chain analysis and problem identification for the selected business. This phase involved 21 selected business owners from Khanghah Vosta and one expert service provider. Data collection was conducted through semi-structured individual and group interviews.

Considering that this research, does not aim to develop a new theory but to extract concepts and classifications related to the analysis of the value chain of the selected business cluster in Khanghah Vosta the Ground theory method was used for its systematic nature in data analysis.

During the data analysis, the researchers repeatedly reviewed interviews transcripts to ensure accuracy and appropriately identify the status of each component. Using multiple data collection methods in qualitative research improve the validity of the findings through a process called triangulation (Cohen et al., 2007).

The main process in grounded theory is data analysis, which is the core of qualitative research This is performed in three stages: open, axial and selective coding (Straus & Corbin, 1998). However, since this study does not aim to develop a theory, only open and axial coding were used. Data collection continued until theoretical saturation was reached (Ranjabr et al., 2012). Theoretical saturation was achieved after conducting 21 interviews with selected business owners, each lasting 20 to 70 minutes, totaling more than 20 hours and plus one 3-hours interview. By reviewing the data, sentences related to the business cluster value chain of the selected and its comparison with the model unit were extracted. Similar sentences were coded with a common code in the form of 48 distinct concepts.

Using an open coding system, the researcher reviews the data line by line and, identifying concepts, and assigning code to each meaningful sentence. By the end of open coding, the initial categories has formed. During axial coding, related codes were compared and grouped into categories based on their similarities, with similar codes merged into broader classes (Haj Bagheri et al., 2011).

In the value chain of the selected business cluster, which includes the staged of supply, production, processing, and marketing and sales, three classes were identified:

1. The current status of the horticulture business in Khanghah Vosta

2. How the model unit operates compared to rural businesses

3. Identified value chain challenges

These classes were the final result of data analysis using the Grounded Theory approach.

4. Findings

In the beginning, the active businesses in the rural area of Khanghah Vosta, through which people make a living, were identified using the semi-structured group interview technique, brainstorming with research participants, and field observation. The results showed that in Khanghah Vosta, there are businesses that produce wheat, grapes, apples, peas, beekeeping, and light livestock, and people make a living through these businesses.

Figure 1. Participation in Rural Assessment in the Khanqhah Vosta village

Next, by implementing the prioritization technique, six main businesses of Khanghah Vosta -wheat, grapes, apples, peas, beekeeping, and light livestock)- were evaluated using seven indicators: the amount of employment, the effect of business development on the development of the rural, the compatibility of the business with the advantages of the province, the potential of business expansion, the capacity of the business to foster cooperation, the availability of stable markets and minimal damage to the environment.

These were scored on scale from 1 (very low), 2 (low), 3 (moderate), 4 (high) and 5 (very high) by the special group (The special group, which included the Dehyar, three rural council members and four agricultural experts from Songhor & Kulyaei County and the businesses were prioritized accordingly.

The results of Table 1 above showed that the Horticulture business (grapes) with 31 points was the priority and was chosen as the main business of Khanghah Vosta. The main income of the people of this rural area is from horticulture (grapes). The results of the interviews also showed that from the 49 households of Khanghah Vosta rural, more than 30 families have gardens, and their main business is horticulture (grapes). In the following, according to the choice of grape professional horticulture (grape) business service provider was selected as a factor development of horticulture (grapes). With the participation of the members' network of the grape horticulture (25 people from the horticulturists of Khanghah Vosta) and 1 model grape business unit in Ravansar City, which performed well, the grape business value chain was examined, and the problems of each of the rings were extracted. After conducting the interviews and repeatedly reviewing the text, 48 concepts were extracted, presented in Table 2.

Table 1. Ranking of groups in Khanghah Vosta rural

Business / Indicator	beekeeping	Horticulture (apples)	Animal husbandry (light livestock)	horticulture (grapes)	Pea	Wheat
Employment rate	3	4	4	4	3	4
The impact of business development on rural development	3	4	4	5	4	4
Compliance of business with the advantages of the province	4	4	5	5	5	5
Business expansion potential (with existing conditions)	4	4	5	5	5	3
The context and capacity of business for the creation of collective cooperation	4	4	4	4	4	4
Availability or availability of sustainable markets	4	4	4	4	4	5
The least damage to the environment of the region	5	4	4	4	5	4
Sum of indicators	27	28	30	31	30	29

Table 2. Concepts extracted from the conducted interviews (open coding)

Row	concepts
1	Limited access to required inputs, including fertilizers and poisons of good quality and at reasonable prices
2	Providing the required machinery and tools through the private sector at a high price
3	Supplying most of the needed seedlings from the private sector without sufficient knowledge in the field of suitable varieties adapted to the region
4	Supplying part of the needed seedlings from the old gardens of the region
5	Lack of scaffolding in the rural gardens
6	Failure to use quality fertilizers and nutrients due to insufficient knowledge
7	Using low-quality poisons due to a lack of sufficient knowledge
8	Irrigation of gardens has been done in a traditional way
9	Traditional garden pruning
10	Failure to implement garden pruning on time
11	Supplying grapes produced in the rural areas area as fresh and unprocessed to the market
12	Selling products at a lower price to brokers
13	Selling part of the manufactured product to friends and acquaintances
14	Purchase of products by brokers in Songhor and Kermanshah counties
15	Selling manufactured products individually and personally
16	Lack of specific planning to sell the product
17	Lack of access to sufficient and specialized knowledge in the field of grape horticulture
18	Lack of supply of poisons, fertilizers, and nutrients needed with quality and enough due to insufficient knowledge in this field
19	Lack of supply of hardware and equipment needed for scaffolding vineyards due to insufficient knowledge in this field
20	Lack of supply of pipes and equipment required for drip irrigation due to insufficient knowledge in this field
21	Lack of supply of equipment needed for grape processing due to insufficient knowledge in this field
22	Failure to provide the necessary equipment and input in a group to reduce costs
23	Lack of sufficient knowledge in the field of planting marketable cultivars compatible with the region
24	Lack of sufficient knowledge on how to prune gardens in the rural areas
25	Lack of sufficient knowledge in the field of garden nutrition in rural areas
26	Lack of sufficient knowledge in the field of combating garden diseases
27	Lack of knowledge in the field of scaffolding production
28	Supply of fresh products
29	Lack of knowledge of product processing and its benefits in rural areas
30	Absence of a marketing unit in the rural region
31	Traditionally, selling products by brokers
32	Lack of group sales culture in the rural
33	Not holding local festivals for product marketing
34	Not participating in provincial and even national festivals
35	Providing current knowledge in the model unit in the field of grape horticulture
36	Providing the tools needed for scaffolding in the pattern unit
37	Supplying suitable reinforcement fertilizers in the pattern unit
38	Providing consistent and quality seedlings in the pattern unit
39	Current scientific knowledge in the field of garden nutrition in the pattern unit
40	Combating garden diseases in the model unit in a principled way
41	Proper and modern irrigation in the model unit
42	Basic pruning of gardens in the pattern unit
43	Scaffolding the vineyard in the pattern unit

Table 2. Concepts extracted from the conducted interviews (open coding)

Row	concepts
44	The supply of some fresh grape varieties that are more marketable by the model unit
45	Processing of part of grape varieties into raisins and grape juice by the pattern unit
46	Having a marketing unit and considering the appropriate market in the pattern unit
47	Having a marketing unit and considering the appropriate market in the pattern unit
48	Production of quality and market-friendly products in the pattern unit compared to the traditional units

According to Table 2, open coding resulted in the extraction of 48 concepts. In the next step- axial coding- after repeated reviewing several times the concepts in 3 categories, including the current activity of the grape growers of Khanghah Vosta rural with 16 main concepts, the problems of the grape horticulture business in Khanghah Vosta rural with 18 concepts and how the Pattern business works with 14 concepts were classified that each of these categories in the value chain of grape horticulture business (supply, production, processing, and marketing) were placed. The results of this comparison and analysis of the grape business value chain are presented in the Table 3.

By examining the value chain analysis of the grape business and comparing it with the Pattern business in Table 3, and through the participation of gardeners and grape business service providers, the priority area for intervention in the grape horticulture value chain was identified. Based on these priorities, a development strategy and an operational plan were prepared and formulated.

The main problem in the grape horticulture value chain lies in the production stage. Gardeners generally lack sufficient knowledge of scaffolding techniques, high-yield grape varieties, proper garden nutrition, pests and diseases control, and the scientific principles of pruning. As a result, their productivity remains below the national and global averages.

Given this situation, the production stage was identified as the top priority for intervention, a finding confirmed by the gardeners themselves. According to the grape network members, the processing stage ranked second in priority. Investigations revealed that most gardeners lack the necessary skills to process grape products and typically sell their produce fresh at low prices.

Therefore, alongside improving production efficiency, it is essential to provide training in processing and packaging grape products. Promoting a culture of product processing within the rural community would improve product life and significantly increase gardeners' bargaining power in the market. Ideally, first-grade products would be sold fresh at fair prices, while second- and third-grade products would be processed, eliminating the need to sell them cheaply and reducing dependence on brokers. This approach would also generate new employment opportunities in the region.

According to the results of the analysis grape business value chain and identified priorities, and using the semi-structured group interviews with grape network members and horticulture experts, the following development strategy was proposed:

1. Increasing production productivity through economic management and improving users' specialized knowledge in nutrition and garden diseases, Scaffolding, principles of pruning, and the use of quality seedlings compatible with the region.

2. Increasing processing knowledge and creating small-scale and home workshops to produce grape products like Raisins, grape juice, and grape vinegar.

Finally, according to the value chain analysis of the grape horticulture business and the development strategy of this business in the rural of Khanghah Vosta, to solve the problems of this business and to increase the income and productivity of gardeners who are members of the grape network, With the participation of the expert research team including researchers and a horticulture expert detailed operational plan was presented. It came to the knowledge of grape growers, and the executive action plan was finalized.

After implementing this action plan in the Khanghah Vosta as a pilot village, significant results were obtained, which can be a model for other regions.

Key impacts include:

• Practical training in garden pruning, nutrition, and scaffolding led to foundational knowledge and scientific practices among gardeners.

• A model garden was visited by grape network members, inspiring one gardener to scaffold his vineyard. This success led other members to follow suit.

• A local grape festival was held, connecting urban consumers directly with rural producers. This enabled gardeners to sell their products at fair prices within their own village.

Ultimately, network members realized that working collaboratively reduces costs, improves access to information, increases bargaining power, and enhances productivity. As a direct result of implementing the operational plan, average yield per hectare increased from 7 tons to more than 12 tons.

Table 3. Introduction of the value chain of horticulture (grapes)

Intervention priority	Concepts related to how the pattern unit works	Concepts related to the main problems of the grape value chain	Concepts related to the current activities of gardeners in Khanghah Vosta in the grape value chain	The links of the grape value chain
3	The use of modern science in the model unit in the field of grape horticulture- Providing the tools needed to scaffold the garden in the model unit - Access to suitable fertilizers and required in the template unit - Providing consistent and quality seedlings in the model unit	Lack of access to sufficient and specialized knowledge in the field of grape horticulture - Lack of supply of poisons, fertilizers and nutrients needed with quality and enough due to insufficient knowledge in this field - Lack of supply of hardware and equipment needed for scaffolding vineyards due to insufficient knowledge in this field - Lack of supply of pipes and equipment required for drip irrigation due to insufficient knowledge in this field - Failure to provide the necessary equipment for grape processing due to inadequate knowledge in this field - Failure to provide the required equipment and inputs in a group to reduce costs.	Limited access to required inputs, including fertilizers and poisons with good quality and reasonable prices- Providing the required machinery and tools through the private sector at a high cost- Supplying most of the needed seedlings from the private sector without sufficient knowledge in the field of suitable varieties adapted to the region- Supplying part of the needed seedlings from the old gardens of the region.	supply
1	Using current scientific knowledge in the field of garden nutrition in the model unit - Fighting Garden diseases in a principled way in a model unit - New irrigation in the model unit - Scaffolding the vineyard in the model unit	Lack of sufficient knowledge in the field of planting marketable cultivars compatible with the region- Lack of sufficient knowledge on how to prune gardens by gardeners - Lack of sufficient knowledge in the field of garden nutrition - Lack of sufficient knowledge in the field of combating garden diseases - Lack of awareness and knowledge in the field of garden scaffolding among rural gardeners	The traditional nature of vineyards and their lack of scaffolding- Failure to use quality fertilizers and nutrients due to lack of sufficient knowledge - Use of low-quality poisons due to lack of sufficient knowledge - Irrigation of gardens in a traditional way - Pruning gardens in a traditional and wrong way - Failure to implement garden pruning on time	Production
2	The supply of some fresh grape varieties that are more marketable by the model unit - Processing a part of the produced grapes into raisins and grape juice to keep it longer and sell it at a higher price by the model unit.	Supply of fresh products - Lack of knowledge of product processing and its benefits in the region	Supply of grapes produced fresh and without processing - Selling products at a low price to brokers - Selling part of the manufactured product to friends and acquaintances	processing
4	Having a marketing unit and considering the appropriate market in the model unit - Participation in various festivals related to planting and selling in the model unit - Production of quality and more marketable products in the model units compared to traditional units.	Lack of marketing units in the rural areas - Selling products in a traditional way by brokers - Lack of group sales culture in the rural areas - Not holding local festivals for product marketing - Not participating in provincial and national festivals.	Purchase of products by brokers in Sanghor and Kermanshah Counties - Selling manufactured products individually and personally - Lack of specific planning to sell the product	Marketing and sales

Table 4. Implementation action plan of horticulture business (grapes)

levels	Activity code	Title activity	Project managers	
			Responsible activity	Partner institution
	First	networking		
	1-1	Select the target rural	development agent (horticulture expert)	Agricultural Jihad Organization
	2-1	Formation of grape networks in the target rural	development agent (horticulture expert)	Agricultural Jihad Organization
1	3-1	Holding a training course on economic management of grapes for gardeners who are members of the network	development agent (horticulture expert)	Agricultural Jihad Organization
	4-1	Implementation of cooperative work practice by network members (such as cleaning gardens from dry branches)	development agent (horticulture expert)	Agricultural Jihad Organization
	5-1	Signing a cooperation agreement between the development agent (horticulture expert) and network members	development agent (horticulture expert)	Agricultural Jihad Organization
	Second	Certification of grape growers		
	1-2	Counting and recording the coordinates of the gardens of gardeners on the contracting party (GPS)	development agent (horticulture expert	Engineering system
2	2-2	Sampling and analysis of water and soil of garden members of the network	development agent (horticulture expert	Engineering system
	3-2	Standard definition of grape products, including raisins and grape juice	development agent (horticulture expert	Agricultural Jihad Organization
	Third	Training and empowering the members of the grape network		
	1-3	Holding a training course on nutrition and irrigation of vineyards	development agent (horticulture expert	Agricultural Jihad Organization
	2-3	Holding a training course on grape cutting and planting	development agent (horticulture expert	Agricultural Jihad Organization
3	3-3	Holding a training course to identify and combat vineyard pests	development agent (horticulture expert	Agricultural Jihad Organization
	4-3	Holding a training course on scaffolding vineyards	development agent (horticulture expert	Agricultural Jihad Organization
	5-3	Holding a training course on pruning and branching of vineyards	development agent (horticulture expert	Agricultural Jihad Organization
	6-3	Network members visiting model gardens in the province	development agent (horticulture expert	Agricultural Jihad Organization
	Fourth	Processing and packaging		
4	1-4	Conducting a national visit to sample processing units in the country	development agent (horticulture expert	Agricultural Jihad Organization
	2-4	Holding a specialized training course on grape processing	development agent (horticulture expert	Agricultural Jihad Organization
	fifth	Documentation and content production		
5	1-5	Production of grape educational content	development agent (horticulture expert	Agricultural Jihad Organization
	2-5	Creating a virtual network and publishing educational content in the form of brochures and clips	development agent (horticulture expert	Agricultural Jihad Organization
	sixth	Market development		
	1-6	Holding a local grape festival in the rural and inviting the provincial officials and the people of Songhor County	development agent (horticulture expert	Agricultural Jihad Organization
6	2-6	Inviting the businessmen of the region and their visit to the gardens of network members and production products	development agent (horticulture expert	Agricultural Jihad Organization
	3-6	Holding a marketing training course for manufactured products	development agent (horticulture expert	Agricultural Jihad Organization

This success has sparked interest in neighboring villages, which have now requested implementation of the same program in their areas.

5. Discussion

The horticulture sector plays a vital role in the national agricultural economy due to its high nutritional value and potential currency earnings. The diverse climate and abundant soil and water resources in Kermanshah province show strong potential to expand agricultural activities. The presence of sloped terrains unsuitable for crop farming, along with the economic nature of horticultural products, has positioned Kermanshah province- and especially Songhor & Kulyaei county- as a favorable region for developing orchard-based agriculture.

The results of the research showed that six major agricultural businesses are active in the Khanghah Vosta village: small-scale livestock, viticulture, apple orchards, beekeeping, wheat, and peas. Among them, the grape horticulture business was identified as the top priority, due to its geographic concentration and importance in the village. This result aligns with the findings of Kord and Khashi (2014).

Further, the research results showed that the value chain of the grape horticulture business includes supply, production, processing, and sales. In the supply chain in the grape garden network of the rural of Khanghah Vosta, there are problems such as limited access to sufficient and specialized knowledge in the field of grape horticulture, inadequate supply of quality pesticides, fertilizers, and nutrients, lack of proper scaffolding tools and irrigation equipment for grape processing Limited awareness of tools required for grape processing, absence of cooperative procurement of inputs to reduce costs. The results are aligned with the results of (Heidari, 2019; Sharma & Anupam, 2014; Safari et al., 2015; Izadi and Mosleh Shirazi, 2012).

Also, the research results showed that in the circle of grape business production, there are similar problems such as lack of awareness about planting high-yield grape cultivars compatible with local conditions, insufficient knowledge of pruning, garden nutrition and pest control, and Inadequate understanding of proper scaffolding techniques. This result is consistent with the results of the research by (Heidari, 2019; Roy & Thorat, 2008; Safari et al., 2015; Izadi and Mosleh Shirazi, 2012).

Processing challenges include: the predominant sale of fresh grapes at low prices, limited knowledge among gardeners about value-added grape products, and their economic benefits. These issues mirror those observed in previous studies (Heidari, 2019; Iazidi & Mosleh Shirazi, 2012).

Finally, marketing and sales challenges include: Absence of formal marketing units in the village, reliance on traditional and broker-led sales, lack of a culture of cooperative sales, no local festivals or events to promote grape products, limited participation in trade exhibitions or tourism-oriented events. These results are consistent with the findings of Musso & Francioni (2015), Roy & Thorat (2008), Izadi and Mosleh Shirazi (2012).

Following the implementation of the executive action plan derived from the grape business development strategy:

• Gardeners received hands-on training in grape production, pest management, nutrition, and scaffolding.

• Inputs were collectively sourced by network members, leading to lower costs and better quality supplies.

• Farmers learned to process second- and third-grade grapes into raisins and grape juice.

• A local grape festival was launched in Khanghah Vosta, bringing together provincial officials and residents, which helped in product promotion and direct sales.

These actions led to:

• A significant increase in productivity—from 7 tons to over 12 tons per hectare

• Increased income for gardeners

• Knowledge-sharing and replication interest from neighboring villages

These results are supported by earlier studies (Heidari, 2019; Sharma & Anupam, 2014; Gagne et al., 2010; Izadi & Mosleh Shirazi, 2012).

Recommendations

Based on the research and practical results, the following recommendations are proposed:

1. Cluster-Based Business Development Promote and support other agricultural businesses based on regional

advantages through cluster models and business networks to reduce costs, increase bargaining power, and encourage knowledge sharing.

2. Participatory Planning Use participatory methods to involve local stakeholders in the identification and development of agricultural value chains and rural business clusters.

3. Technical Training for Gardeners Provide targeted training in pruning, nutrition, disease control, and scaffolding techniques for other grape growers in the region.

4. Exposure to Model Orchards Organize educational visits to successful model vineyards to promote the adoption of scientific horticultural practices.

5. Festival-Based Marketing Organize grape festivals during the harvest season to attract tourists and connect rural producers with urban consumers. These events can serve as effective marketing platforms for rural products.

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Conflict of Interest

The authors declared no conflicts of interest.

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