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Original Article

The Spatial Analysis of the Distribution of Agro-Processing Industries in Rural Areas of Guilan Province, Iran

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Abstract

Purpose- The growing attention to rural development issues has created a strong trend in related scientific communities, as over the last few years one can see the traces of this thinking in many relevant scientific trends. One of the most important relevant subjects was job creation using the resources available in rural areas in line with their industrialization and the emergence of agro-processing industries. Spatial distribution of rural industries, spatial justice and their fair distribution based on the distribution of rural settlements have been among the most important concerns in this field. Therefore, the present study aimed to investigate the distribution of agro-processing industries with a spatial approach in rural areas of Guilan Province.

Design/methodology/approach- This research is an applied one conducted in a descriptive-analytical method. The collected data were analyzed using the average nearest neighbor, multi-distance spatial cluster analysis, mean center and standard deviational ellipse. Results showed that industries in rural areas of Guilan Province have been located in clusters.

Finding- That is, their sites were selected with an eye to favorable conditions such as proximity to cities, population centers and markets, access to infrastructure, proximity to political and decision-making centers, access to major roads, access to more raw materials and cheaper agro-processing industries. Such industries are often located in the counties of Rasht, Rudsar, Astar, Talesh, Lahijan, Langrud and Sowmehsara. Therefore, the officials in charge should make plans to establish agro-processing industries in a more scattered and diverse manner in Guilan Province.

Keywords: Spatial analysis, Agro-processing industries, Rural development, Guilan Provinc.

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1. Introduction

Industrialization and agricultural revolution that accompanied it initiated a surge in urbanization that continues in many parts of the world, as thousands of rural workers migrate to the cities seeking employment (Hanks, 2011). Accordingly, as rural employment received growing attention and given the position of industries, rural industries have attracted special attention**.** Perhaps this can be traced back to the 1960s, as the concept of sustainable agriculture has increasingly been used to denote unstable but important disconnection from what is known as "the dominant model of industrial agriculture and rural development" (Kitchin & Thrift, 2009), and its results can be due to the connection between the concept of sustainable development and development of agro-processing industries. Rural industrialization is a strategy that provides appropriate tools for the diversification of the rural economy; therefore, it is an economic approach improving the living standards of villagers by creating employment and increasing income and its more balanced distribution, and it makes way for sustainable rural development (Balali et al., 2015 as cited in Lee, 2007).

If due attention is paid to establishing rural industries, an important step will be taken in rural employment. Nevertheless, the important point which is also the main problem discussed in the present study is how industries are distributed in rural areas. If the officials in charge do not pay due attention to the distribution of industries and suffice to functionalist per capita, the existing realities about rural development will be forgotten, and we cannot have much hope for the expansion of rural development. In case of weak distribution of industries and their build-up in certain areas, only a small number of the villages will enjoy their benefits. Therefore, identifying the current situation of rural industries in terms of how they are distributed can reveal the existing facts, and one can take a more purposeful step towards the development of rural industries.

Developing countries have complexities in various dimensions from understanding to implementing the patterns found in their countries. These countries are characterized as "labor abundant and capital scarce" (Venkatachalam & Sangeetha, 2020), and these inequalities in labor and capital at the domestic scale of these countries are also seen hierarchically from large cities to small towns and villages, as the villages are in a much worse situation. Therefore, to make policies and plans, "it is essential to identify the sources of investment growth in agro-processing industries" (Mohammadi et al., 2018).

Rural industrialization is an economic strategy, as higher welfare, supply of goods and essential services for poor rural families are somehow related to the industrialization of rural areas and the expansion of non-agricultural activities (Anabestani et al., 2019); in fact, "rural industrialization provides appropriate tools for rural diversification" (Akbari Sagalaksari & Pour Ramazan; 2018), which deserves special attention in rural studies. On the other hand, over the last decade, in addition to individual factors, the role of time and place is also taken into account in planning for new economic units (Zahedian Tajnaki et al., 2019). Therefore, one should give careful attention to effective indicators and how they are related to establishment of main rural industries, as

'their optimal location plays a decisive role in their establishment, profitability and sustainability (Toulabinejad & Hosseinjani, 2018).

The study of spatial distribution of population in the world, especially in developing countries, reveals the imbalance in the network of population settlement and exploitation of land resources (Nazarian, 2009), which is due to various factors. Given the different natural-ecological, historical, cultural and socio-economic characteristics of any region, various factors are involved in the accumulation of rural settlements (Saeedi, 1999). In fact, the evolution of the world from a rural one to an urban one is a subject with many related concepts and issues, and the existing inequalities have been formed not only in services and facilities but also in a basic principle called employment. This means that the villagers flood to the cities to find job opportunities rather than using urban services and facilities. The rural areas mainly rely on the productive capacity of their living space as an environment for living, activity and production of a group of people who are engaged in production and productivity and have less population and fewer facilities than urban areas (Motiee Langroudi, 2001). The patterns of spatial and rural settlements, due to the dependence of most of its production activities on natural factors and

conditions, are more affected by natural factors due to the overlap of production and value roles in these criteria as compared with urban settlements (Azimi, 2003); the strengthening or weakening of these features can lead to dynamism or, conversely, disorder and disturbance in the current functions of the physical-spatial system of the rural areas (Sartipipour, 2005).

In Iran, rural employment development, founded in Articles 28, 29, 43, 44 and 48 of the Constitution, has received special attention for several years. In the meantime, special attention has been paid to agro-processing industries, as it is emphasized in Article 27 of the Law of the Sixth Five-Year Economic, Cultural and Social Development Plan for 2016-2021, known as the Sixth Five-Year Development Plan, according to which the government is obliged to the general policies of the plan and Resistance Economy, the identification and utilization of existing capacities in rural areas and the promotion of social status of villagers and the position of rural areas in the national economy and creating the essential basis for the prosperity and fair development of rural areas in accordance with laws and regulations (the Sixth Five-Year Development Plan of the Islamic Republic of Iran 2016-2021).Its main objectives includes strengthening existing capacities and creating new production capacities with emphasis on completing the value chain and production chain with the participation of the non-governmental sector in the target rural areas. Accordingly, the agro-processing industries in Iran have become several times more important than before. The high rate of agricultural waste in Iran varying between 13 to 35 percent (Eghbali et al., 2018) clarifies the need to find a way to reduce this waste as much as possible; the development of agro-processing industries is a practical way to reduce the agricultural waste.

Guilan Province is known as an agriculture-dependent economy. The modern industrial age of this province began with the construction of the Rasht silk factory more than a century ago, and it has gradually developed by relying on natural advantages, especially agricultural ones in the fields of silk, tea, hemp, rice, olives and textiles. Contemporarily, many industries have been established, including pharmaceutical, steel, non-metallic, mineral, health, electronics, food and beverage industries, while the number of active industrial units now exceeds 2600 and the number of people directly employed in the industries and mines reaches 87,000 (the website of the 'Industry, Mining and Trade Organization of Guilan Province, 2020). The current capacities of the province include dozens of production and processing units of tea, rice, olives, dairy products, beer, mineral water, canned food, etc. Besides, Guilan has long been well-known as a center for confectionery production, especially cakes and cookies, and the development of industries related to these products has now made Guilan Province the main hub for the production and export of cakes and cookies in the region (ibid). However, the existence of food processing industries in the province and its strengths and weaknesses is not the only matter of importance, but also how they are distributed in the province is particularly important. This study seeks to investigate the spatial distribution of agro-processing industries in Guilan Province.

Accordingly, this study seeks to answer the question of how agro-processing industries in Guilan Province are distributed?

2. Research Theoretical Literature

Rural development as a strategy to improve the socio-economic life of poor rural people (Rezvani, 2002) should be considered as a multi-part core of a broader development process (Papoli Yazdi & Rajabi Sanajerdi, 2003). Definitions provided for rural development have many common points (Ezkia, 2005), as the ideas, beliefs and institutions have affected the process of rural development at the global (international organizations and institutions), regional and national levels, aking developments in recent decades into account and realizing the need for change (Badri & Taherkhani, 2008). Rural development should have a comprehensive and integrated view of rural issues and consider sustainability in both planning and implementation. Therefore, making use of all capacities of a village, including agriculture, industries, services and tourism can accelerate the process of rural development. Agro-processing industries are among the potentials of rural areas, which can act as a driving force for the agricultural sector. The terms "rural industries" and "cottage industries" are also used interchangeably and sometimes simultaneously by planners and managers to mean traditional industries. They do not provide a clear definition for these conditions (Venkatachalam & Sangeetha, 2020). In fact, "the development of the agricultural sector is important,

but more emphasis should be placed on the development of the industrial sector, as only this sector can help solve many of the problems facing our economy" (Venkatachalam & Sangeetha, 2020), and promoting the integration of the industries in rural areas is a major step to adjust to the economic and social developments in a "new normal" (Zhu & Lin, 2018). Meanwhile, the theory of integrated industrial development has provided new opportunities for the reform and development of many industries and has shown a new direction for agricultural development (Wang, 2019). The integrated development of the primary, secondary, and tertiary industries in rural areas is an important approach to broaden the channels for farmers to increase income and build a modern agricultural industrial system (Zhu & Lin, 2018).

Therefore, the integrated development of the primary, secondary, and tertiary industries in rural areas

has gradually become a new direction to solve the agricultural problems and issues in rural areas, increase farmers' incomes and realize the secondary development of rural economy (Wang, 2019). Derbile et al. (2012) believe that the integration of rural industries results from the impact of high technologies on traditional industries; it is the process of merging two or more industries into a new industrial form. Puthal and Mohanty (as cited in Wang, 2019) believe that industrial integration should be based on a common technology.

Apart from their high employment potentials, rural industries with much less investment can play an effective role in addressing rural issues, such as inequality and poverty, income and facilities distribution, migration, etc. Rural industries and agro-processing industries need less investment compared to large industries, as their raw materials are found in rural areas and have a relatively reasonable production cost; therefore, they can act as a key factor in rural development.

Agro-processing industries refer to a subcategory of the manufacturing sector which process agricultural products (including those of horticulture, forestry, fishery, etc.); therefore, they are usable to consumers (Emeafor & Okpoko, 2018). According to Emeafor and Okpoko, agro-processing industries are classified into the food and non-food industries. The food processing and manufacturing industry may well change the raw agricultural commodities in either ingredient for further processing or indeed as the final consumer products such as soybeans, bakers, meat packers, flour millers, wet corn mills, breakfast cereal companies. In the non-food sector, along with the processing and production of foodstuffs such as beverage, tobacco, fibre, yarn and thread mill as well as the tanneries are making huge impact in the agribusiness industries (Mussa & Zhi Zhang, 2016). The capacity of agro-processing industries to foster development includes ensuring food security, creation of jobs, generation of income, minimizing post-harvest losses, promoting price stability, increasing demand for local agricultural produce in addition to serving as catalyst for agro-tourism development (Emeafor & Okpoko, 2018). To improve the units that can be used in the agricultural process, it is suggested that more motivational, skill-based and entrepreneurial programs be developed to improve the managerial competence of the entrepreneurs. As they have a high level of innovation and risk-taking capabilities, entrepreneurs wish to make more profit through entrepreneurship. It is thus important to motivate them and train them with new skills and techniques by creating more branches of Small Industries Service Institute (SISI) in each regional office (Pardip Singh Shehrawat, 2007). With this policy, one can solve the problem of lack of fund which is as a long-standing problem affecting the development of small industries in developing countries; in fact, "it is a problem which is common in starting a business and then in growing and developing the activities" (Derbile et al., 2012). It is noteworthy that the development of agro-processing industries has also some disadvantages as well. Rapid agro-industrial expansion in both developed and developing countries are major contributors of environmental pollution worldwide. Increased industrial activities, particularly in developing countries led to pollution stress on surface water due to the discharging of large quantities of wastewater without adequate treatment techniques (Alayu & Yirgu, 2018). The very nature of community based agro-processing industries does not make this consideration central to location. However, "rural industrialists are able to find markets for their products within the framework of functional urban regions in which local interrelationships take place, which is describes as intra-regional contacts" (Derbile, Abubakari, & Dinye, 2012). Figure 1 shows the conceptual model of the study.

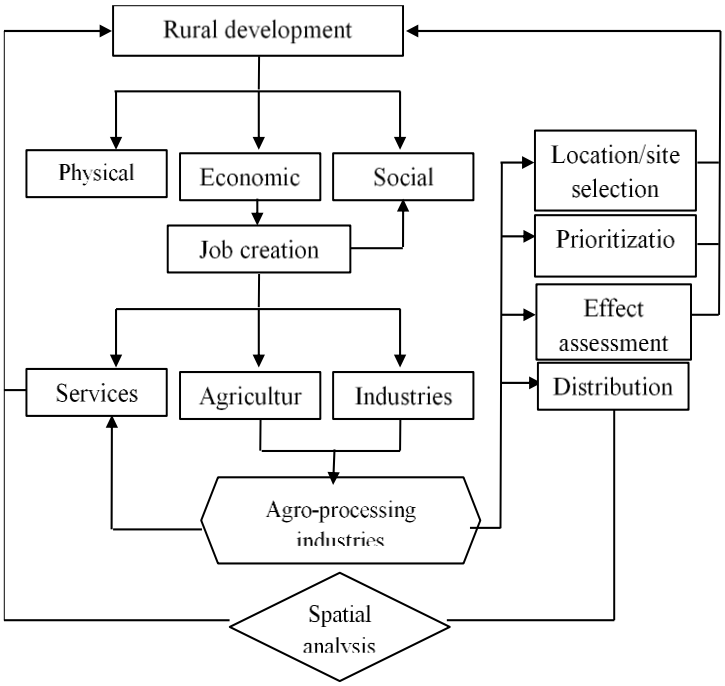

Figure 1. Conceptual model of the study
(Source: Authors, 2020)

In this regard, many studies have been conducted on agro-processing industries, some of which are discussed below:

Zangiabadi, Fathi, and Izadi (2011) concluded that the eastern counties of the province are deprived of agro-processing industries and should be in top priority to receive development facilities. The second level of development priority includes the western and southern counties of the province. Levels of meta-development have stretched linearly from northwest to southeast and have been the last priority for development (Zangiabadi et al., 2011).

Nouri et al. (2012) concluded that the greatest relative significance in site selection for date processing industries are respectively related to the indicators of access to raw materials, economic profitability, access to transportation network, energy resources, geographical conditions, land prices and workforce. Eventually, the best spatial priorities for date processing industries in the county were also introduced. Khajeh Shahkouei et al. (2013) concluded that the counties of Aliabad, Gorgan, and Ramyan have a high priority for the establishment of agro-processing industries. Abazari & Hosseini Yakani (2014) concluded that counties of Behshahr, Neka and Sari as compared wuth other counties of Mazandaran Province have more capabilities for construction of processing industries. Nowruzi & Fathi (2015) concluded that entrepreneurship in processing industries can play a significant role in the rural economy and believe an aggressive strategy is the appropriate one for this purpose. Zaheri et al. (2015) concluded that industries related to the processing of surplus dairy products should receive the top priority in Azarshahr County as they are perishable, and then agro-processing industries related to horticultural products products produced in the region should also be given priority due to their important role in the optimal use of agricultural.

Amiri et al. (2017) concluded that the order of priority for development of agro-processing industries in the province, contrary to existing conditions, should be horticulture, fisheries, livestock and agriculture, respectively. Higher investment in horticultural, fishery and livestock processing industries can be effective in achieving a reduction in waste, a higher employment rate and more income for the villagers, respectively. In another paper, Pardeep & Shehrawat (2006) found that quality management, marketing management, packaging techniques, marketing techniques, technology grading, financial management, brand promotion, export promotion techniques, product advertising and personnel management are important parts of training preferred by entrepreneurs.

These studies show that the literature on rural agro-processing industries is largely related to site-selection, prioritization and impact assessment. That is, since the view of this study is geographical and the location is

dependent as a rule, it has mainly sought resources that have been more relevant. Otherwise, one can find many studies in other fields, especially economics and industry, which of course are far from the subject of this study. However, as can be seen in the literature, in terms of site-selection, more attempts have been made to identify a suitable place for agro-processing industries based on some theoretical foundations, such as sustainability and the like. On the other hand, in other studies, the product has been discussed rather than the appropriate location or distribution of the industries. This is also found in measuring the effects; in fact, the effects of rural industries in different aspects of rural life are measured. Therefore, the spatial analysis based on the distribution of agro-processing industries using spatial statistics and GIS has been less considered and only in site selection papers, one can see the dispersion of industries in the indicators. Therefore, in this study, we investigated the spatial distribution of agro-processing industries in rural areas of Guilan Province.

3. Research Methodology

This study is of descriptive-analytical type. The most important data required for research were the distribution of villages with agro-processing industries and the number of such industries in Guilan Province. The data were collected through documentary studies, including information received from the General Directorate of Agricultural Jihad in Guilan Province (updated in 2017), then they were analyzed after being fed into GIS, which included the number and variety of rural agro-processing industries. In total, there are 2895 villages in Guilan Province (Statistical Center of Iran, 2016) of which 1094 villages have agro-processing industries.

Given the purpose of the study, the analysis of spatial distribution of agro-processing industries in rural areas of Guilan Province, the average nearest neighbor distance, multi-distance spatial cluster analysis (Ripley's K function), mean canter and standard deviational ellipse were used.

The average nearest neighbor distance tool measures the distance between each feature centroid and its nearest neighbor's centroid location. It then averages all these nearest neighbor distances" (Asgari, 2011). The average nearest neighbor ratio (r) is calculated as the observed average distance divided by the expected average distance. After calculating the value of r, the spatial pattern of the observed distribution can be determined. The nearest neighbor ratio is based on the distance between features, and as compared to other methods, it provides better results in the analysis of features that are interrelated. If the average distance is less than one, the distribution of the features being analyzed are considered as clustered. If the average distance is greater than one, the features are considered as dispersed (Asgari, 2011).

The distribution of many geographical phenomena in space may be directional and cannot be represented by a circle. In these cases, by calculating the variance of the x and y axes separately, the trend and direction of the distribution of phenomena in space could be shown. The method typically used to measure the trend in a set of points or areas is to calculate the standard distance between x and y separately. These two values define the elliptical axes that cover the distribution of features. This ellipse is also referred to as the standard deviational ellipse, as in this standard deviation method, the x and y coordinates of the mean center are calculated to determine the elliptical axes. This ellipse let us know if the distribution of space features has a directional pattern. Although the direction of the data could be identified to some extent by their initial representation, the standard deviational ellipse calculates and displays this direction accurately and statistically (Asgari, 2011). Standard deviational ellipse, calculated by using standard deviation, determines the distance of the location of each data to the center of the mean, its distribution, direction and position (Kalantari & Ghezelbash, 2009).

4. Research Findings

4.1. Distribution of agro-processing industries in rural areas of Guilan Province based on the average of the nearest neighbor

According to the results, the average of the nearest neighbors for agro-processing industries in rural areas of Guilan Province is shown in Table 1:

Table 1. Distribution pattern of the variable based on the nearest neighbor ratio
(Source: Research finding, 2020)

agro-processing industries	
Nearest neighbor ratio	0.593
z- score	-25.69
p- value	0.000

As Table 1 shows, the distribution pattern of agro-processing industries is a clustered one. The study of the formation positions of these clusters based on internalization shows that agro-processing industries in rural areas of Guilan province are more inclined to the center of the province and the abundance of such industries in the central villages of the province and those near larger cities confirm this trend.

The spatial correlation map (see Figure 2) clearly shows that the closer the villages are to the cities, the greater the number of agro-processing industries. The less the distance from the cities, the more the agro-processing industries. One of the most important reasons for this is the existence of more infrastructure that strengthens the spatial superiority of an industry which also promotes its efficiency. Besides, more access to the market and better access roads is among the reasons for locating agro-processing industries near cities. This is especially noticeable on the main west-east road from Rasht to Rudsar and also on the main road from Rasht to Qazvin.

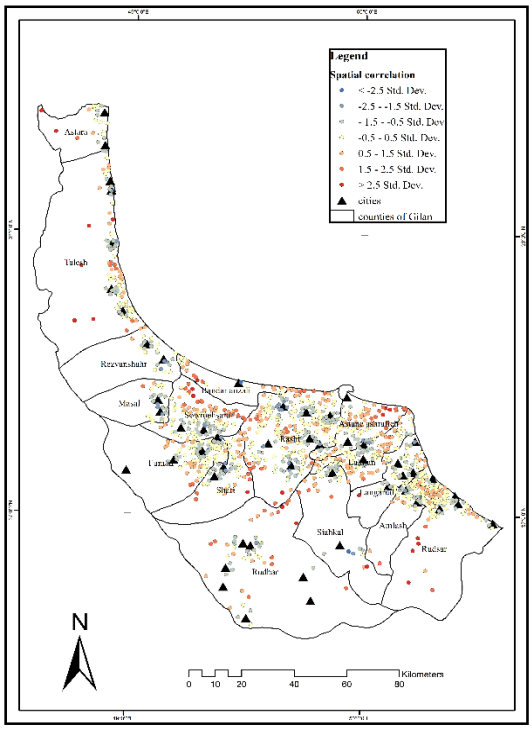

Figure 2. Spatial correlation between the number of agro-processing industries in the villages of Guilan Province and their proximity to the cities
(Source: Authors, 2020)

As Figure 3 shows, most of these industries are located in the cities of Rasht, Rudsar, Astara, Talesh, Lahijan, Langrud and Sowmehsara. For example, in Rasht, 115 industries have been located. This is true even about the diversity of industries. As in cities such as Rasht or Rudsar, the diversity of agro-processing industries is more than other areas.

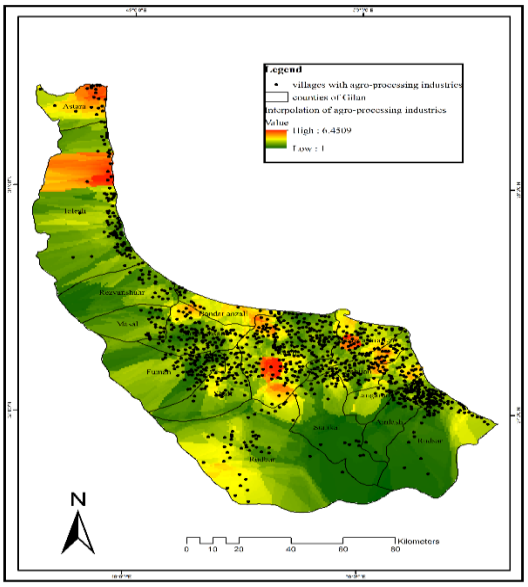

Figure 3. Interpolation of agro-processing industries in the villages of Guilan Province based on their number in each village
(Source: Authors, 2020)

Agro-processing industries in Guilan Province are divided into four categories of agriculture, horticulture, livestock and fisheries. Of 1094 villages having agro-processing industries, 819 villages only have one type of the above industries, 227 villages have two types of the industries, 44 villages have three types of the industries and 4 villages have four types of the above-mentioned industries. Figure 4 shows the distribution map of the diversity of agro-processing industries in Guilan Province.

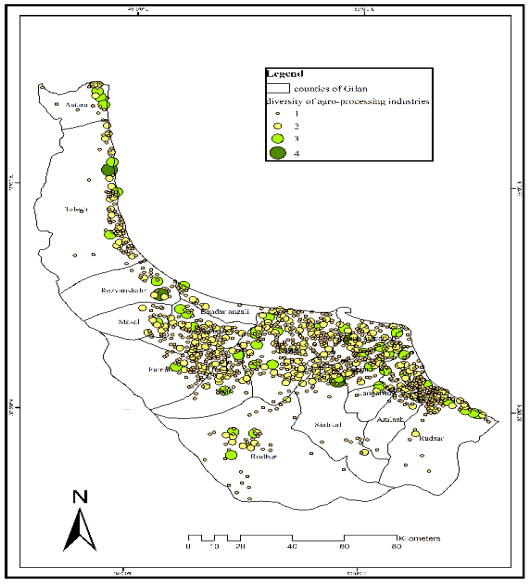

Figure 4. Distribution of diversity of agro-processing industries in the villages of Guilan Province
(Source: Authors, 2020)

4.2. Investigation of agro-processing industries in the villages of Guilan Province based on multi-distance spatial cluster analysis

For this purpose, Ripley's K function was used, which is one of the useful tools for statistical study of the spatial pattern of a phenomenon of interest in space and place, which shows the clustering of the phenomena at different geographical distances (see Figure 5). In the figure below, the horizontal axis shows the distance, and the smooth diagonal

line represents the pattern of random distribution (Asgari, 2011). In general, the higher the curve of the observed results than the expected curve of the results, the more clustered are observations at that distance. Conversely, the lower the observed results curve than the expected results curve, the more scattered are the data at that distance.

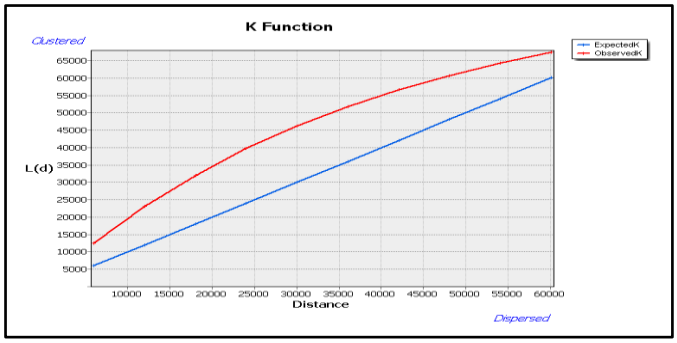

Figure 5. Ripley's K function of agro-processing industries
(Source: Authors, 2020)

The general interpretation of Figure 5 shows that in general, the agro-processing industries in the villages of Guilan Province follow a cluster distribution. It can also be stated that the tendency to random distribution is almost observed at farther distances, because the tendency to clustered industries decreases.

The hot spot map of agro-processing industries in the villages of Guilan Province (see Figure 6) also shows that these stains are mostly developed in the counties of Rasht, Astaneh Ashrafieh, Lahijan and Astar. One of the reasons behind the clustering of these industries is the ability to invest in these clusters. As in many rural areas at the counties of Guilan Province, poor financial conditions prevent the establishment of agro-processing industries or even the development of agricultural mechanization. However, in some counties, due to better financial conditions (in some cases due to the sale of a part of their agricultural land to non-locals), the villagers are able to invest in agro-processing industries.

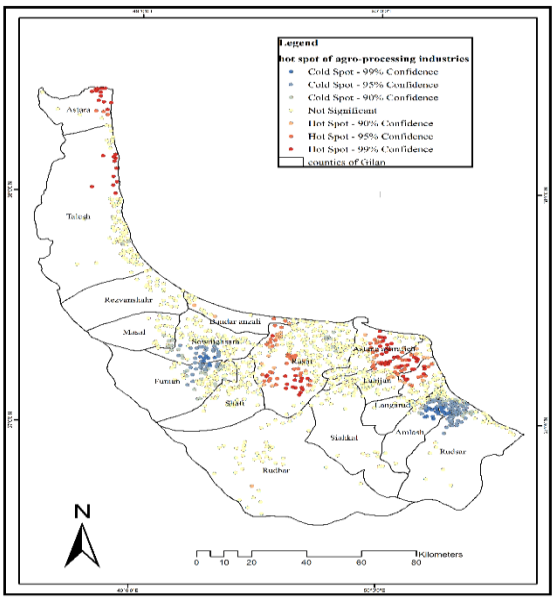

Figure 6. Hot spot of agro-processing industries in the villages of Guilan Province based on their number in each village
(Source: Authors, 2020)

4.3. Mean center

In the analysis of the mean center, the geographical center or the center of concentration of a set of features is identified. In other words, this analysis attempts to determine the central point of dispersion of the interest subjects. As mentioned before, the agro-processing industries in the villages of Guilan Province have been studied as the main subject. The results of this study are shown in Figure 7. As can be seen, the mean center of agro-processing industries in the villages of Guilan Province is located in Rasht.

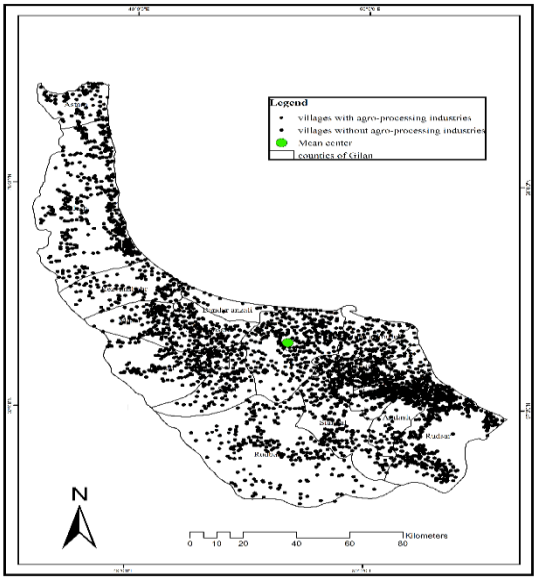

Figure 7. Mean center of agro-processing industries in the villages of Guilan Province
(Source: Authors, 2020)

4.4. Standard deviational ellipse

Thus far, the distribution and mean center of the variables have been studied, but the direction of their distribution is not clear. For this purpose, a standard deviational ellipse was used for each of the variables; the result is shown in Figure 8.

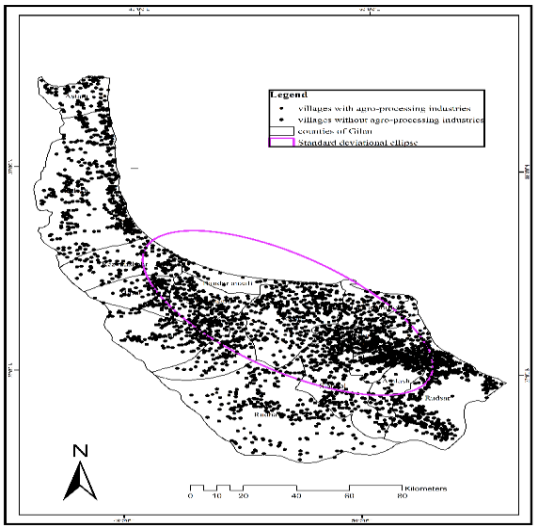

Figure 8. Standard deviational ellipse of agro-processing industries in the villages of Guilan Province
(Source: Authors, 2020)

As shown in the figure above, the distribution of agro-processing industries in the villages of Guilan Province has a northeast-southeast direction. It seems that one of the important reasons for this is that the oval area has more raw materials, more workforce, better access to the

transportation networks and also has better access to the market for the construction of agro-processing industries.

4.5. Rural areas, agro-processing industries and the counties

Cities with a huge volume of demand for the products of agro-processing industries have a great impact on the site-selection of agro-processing industries near them. The same is also true in Guilan Province. As Figure 9 shows, the villages with more agro-processing industries are located closer to the cities. In other words, taking advantage of the existing demand in the cities and more access for agro-processing industries to the facilities and infrastructure in the cities have encouraged more agro-processing industries to be established in the villages close to the cities.

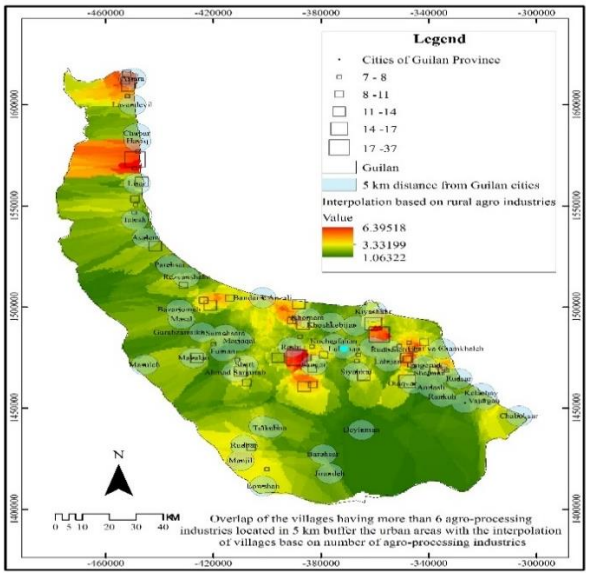

Figure 9. Overlap of the villages having more agro-processing industries with the urban areas
(Source: Authors, 2020)

In general, the larger and more populated the cities, the deeper their impact would be on site-selection and distribution of agro-processing industries.

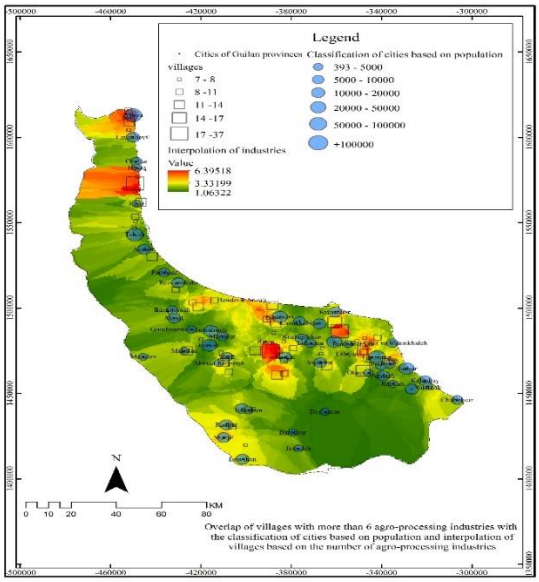

Figure 10. Overlap of the villages having more agro-processing industries with urban space according to their population
(Source: Authors, 2020)

5. Discussion and Conclusion

Agro-processing industries are among the industries established and developed in areas with agricultural potentials. Agro-industries can act as a necessary condition and stimulus for the development of this sector. In fact, the industrialization of agriculture and the development of agro-processing and complementary industries in the agricultural sector are closely inter-related. Most of the agro-processing industries are also located in rural areas where most of their employees are engaged in agriculture. Meanwhile, knowing the distribution of agro-processing industries in rural areas and the impact they receive from various factors can be useful in planning for the development of this sector. Therefore, in this paper the spatial analysis of the distribution of agro-processing industries in the villages of Guilan Province is studied. The results of the analysis show that the agro-processing industries in the villages of Guilan Province are located in clusters. That is, due to favorable conditions in certain areas of the province, a large number of them were established in specific villages and cities. These favorable conditions include proximity to population centers and markets, access to infrastructure, proximity to political and decision-making centers, access to main roads, access to more and cheaper raw materials. The results are in line with the study conducted by Zangiabadi et al., (2011). In their research, Isfahan Province has different levels of development in industries. In the meantime, proximity to cities, especially large cities, can provide all the desirable features for locating industries. For this reason, it is observed many rural agro-processing industries are concentrated in clusters near the large and central cities of Guilan Province. These cities are always attractive to industries due to facilities provided for industries, including transportation, energy, workforce, etc. This has also been emphasized by Nouri et al. (2012). Nevertheless, this trend is not favorable in general, as it deprives many areas of the province from agro-processing industries; consequently, the villagers turn to presale or sale of their raw agricultural products, which will decrease their income. This is especially evident in the citrus processing industries. Sometimes, due to the high level of production and the lack of agro-processing industries in many parts of the province, the products are either discarded or purchased by brokers at low prices. This priority has been emphasized in a research conducted by Amiri et al. (2017). Therefore, the presence of abundant raw materials can increase the need to pay attention to the establishment of agro-processing industries. The fact that areas with a high level of agricultural production have a higher priority for the construction of agro-processing industries has also been confirmed by Khajeh Shahkoohi et al. (2013), Zaheri, Aghayari Hir and Zakeri Mayab (2014), and Abazari and Hosseini Yakani (2014). On the other hand, the establishment of agro-processing industries is highly dependent on the economic situation of the villages and consequently the counties of the province. As many counties in the province are economically weak, they have fewer agro-processing industries. The analyses show that most of the agro-processing industries in the province are concentrated in the counties of Rasht, Rudsar, Astar, Talesh, Lahijan, Langrud and Sowmehsara, which are counties with better economic conditions. Therefore, due to the high costs of establishing such industries, on the one hand, and the weak financial conditions of the villagers on the other hand, it is essential that government support agro-processing industries, as they have many positive effects on the rural economy. This support can even be in the form of consulting services for creating cooperatives to establish agro-processing industries; some successful examples of which are found in the province. By collecting micro-capital of local people, the cooperatives help the household economy, which leads to job creation and higher agricultural productivity. This positive effect has also been emphasized by Nowruzi & Fathi (2015). Therefore, there should be plans to establish agro-processing industries in a more scattered, and of course, more diverse manner in Guilan Province. In addition to selecting suitable locations for the construction of industries, the type of industries must also be considered. There should be agro-processing industries whose raw materials and other optimal conditions are available in their vicinity. Therefore, it is essential to prioritize the construction of agro-processing industries. In addition, in order to make more use of agricultural products, it is necessary to build cold storages to store crops during the harvest seasons, which is accompanied by an increase in the input of the existing industries. Attracting foreign investors should also be considered along with using the capacity of knowledge-based companies to turn agricultural products into other value-added products, such as the extraction of tea oil.

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Original Article

تحلیل فضایی پراکنش صنایع تبدیلی کشاورزی روستاهای استان گیلان

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چکیده مبسوط

۱. مقدمه

توجه به ایجاد صنایع روستایی گام مهمی در ارتباط با اشتغال روستائیان برداشته خواهد شد، اما نکته مهمی که در این میان باید موردتوجه بیشتری قرار بگیرد و درواقع مسئله اصلی پژوهش حاضر به شمار می‌رود، نحوه توزیع صنایع در نواحی روستایی است. در صورت عدم توجه به نحوه پراکنش صنایع و بسنده کردن به سرانه‌های کارکردگرایانه، واقعیت‌های موجود در زمینه توسعه نواحی روستایی فراموش‌شده و نمی‌توان به همه‌گیر شدن توسعه روستایی امید چندانی داشت. چراکه در صورت ضعف در پراکنش صنایع و اجتماع در برخی نواحی خاص، فقط بخش کوچکی از روستاها از منافع آن بهره‌مند می‌شوند و بخش عمده‌ای از روستاها از آن بی‌بهره می‌شوند. بنابراین ازاین‌رو شناسایی وضع موجود صنایع روستایی ازنظر چگونگی پراکنش آن‌ها می‌تواند حقایق موجود را آشکار ساخته و به‌طور هدفمندتر در راستای توسعه صنایع روستایی گام برداشت. این پژوهش به دنبال پاسخگویی به این سؤال است که پراکنش صنایع تبدیلی کشاورزی در استان گیلان چگونه است؟

۲. مبانی نظری تحقیق

صنایع تبدیلی باعث تضمین امنیت غذایی، ایجاد شغل، ایجاد درآمد، به حداقل رساندن ضرر و زیان پس از برداشت محصول، افزایش ثبات قیمت، افزایش تقاضا برای محصولات کشاورزی محلی می‌شود. قابل‌ذکر است گسترش صنایع تبدیلی کشاورزی در کنار مزایای خود، معایبی نیز دارد.

گسترش سریع کشاورزی در هر دو گروه کشور توسعه‌یافته و درحال‌توسعه نقش مهمی در آلودگی محیط‌زیست در سراسر دنیا دارد. ماهیت جامعه مبتنی بر صنایع تبدیلی کشاورزی منجر می‌شود که موضوع مکان این صنایع به‌عنوان موضوع محوری مطرح نشود ولی بااین‌حال ، صنعتگران روستایی قادر به یافتن بازارهایی برای محصولات خود در چارچوب مناطق عملکردی شهری هستند که در آن روابط متقابل محلی انجام می‌شود، روابطی که از آن به‌عنوان تماس‌های درون منطقه‌ای یاد می‌شود و باعث ایجاد فرصت‌های بازاریابی و معاملات برای صنعتگران روستایی می‌گردد.

۳. روش تحقیق

پژوهش حاضر از نوع توصیفی – تحلیلی است. مهم‌ترین داده موردنیاز برای انجام پژوهش، پراکندگی روستاهای دارای صنایع تبدیلی و تعداد این صنایع در استان گیلان بوده است.

این داده‌ها از طریق مطالعات اسنادی شامل اطلاعات دریافتی از اداره کل جهاد کشاورزی استان گیلان (مربوط به سال ۱۳۹۶) بوده که پس از انتقال داده‌ها شامل تعداد و تنوع صنایع تبدیلی روستاها به سیستم اطلاعات جغرافیایی، تجزیه‌وتحلیل بر روی آن صورت پذیرفت. درمجموع استان گیلان دارای ۲۸۹۵ روستا می‌باشد (مرکز آمار ایران، ۱۳۹۵) که از این تعداد، ۱۰۹۴ روستا دارای صنایع تبدیلی می‌باشند.

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با توجه به هدف پژوهش مبنی بر تحلیل توزیع فضایی صنایع تبدیلی در روستاهای استان گیلان، از روش‌های میانگین نزدیک‌ترین همسایه، تحلیل خوشه‌ای فضایی چند فاصله‌ای، تحلیل میانگین مرکزی و بیضی انحراف معیار استفاده‌شده است.

۴. یافته‌های تحقیق

با توجه به نتایج به‌دست‌آمده از میانگین نزدیک‌ترین همسایه برای صنایع تبدیلی در روستاهای استان گیلان به میزان ۰/۵۹۳ هست. همبستگی فضایی این مطالب را نشان می‌دهد که هر چه روستاها به شهرها نزدیک‌تر هستند، تعداد صنایع تبدیلی آن‌ها نیز بیشتر می‌باشد. یعنی فاصله کمتر از شهرها و تعداد صنایع تبدیلی بیشتر. یکی از مهم‌ترین دلایلی این امر وجود زیرساخت‌های بیشتر می‌باشد که تقویت برتری‌های مکانی یک صنعت و افزایش کار آیی آن می‌گردد. همچنین دسترسی به بازار فروش بیشتر و راه‌های دسترسی بهتر می‌تواند از علل مکان‌یابی صنایع تبدیلی در نزدیکی شهرها باشد. این امر بخصوص در مسیر جاده اصلی غربی – شرقی رشت به رودسر و همچنین جاده اصلی رشت به قزوین قابل‌ملاحظه است. بیشترین تعداد این صنایع در شهرستان‌های رشت، رودسر، آستارا، تالش، لاهیجان، لنگرود و صومعه‌سرا مکان‌یابی شده‌اند. به‌طور مثال در شهرستان رشت تعداد ۱۱۵ صنعت مکان‌یابی شده‌اند. این امر حتی در تنوع صنایع نیز مصداق پیدا می‌کند. بطوری که در شهرستان‌هایی مانند رشت یا رودسر تنوع صنایع تبدیلی بیشتر از سایر نقاط می‌باشد. بر اساس تقسیم‌بندی صورت گرفته از تنوع صنایع تبدیلی استان گیلان در چهار نوع زراعی، باغی، دامی و شیلات، مشخص‌شده است که از ۱۰۹۴ روستایی که صنایع تبدیلی دارند، ۸۱۹ روستا دارای یک نوع صنعت، ۲۲۷ روستا دارای دو نوع صنعت، ۴۴ روستا دارای سه نوع صنعت و ۴ روستا دارای چهار نوع صنعت ذکرشده می‌باشند.

۵. بحث و نتیجه‌گیری

نتایج تحلیل‌ها نشان می‌دهد که صنایع تبدیلی واقع در روستاهای استان گیلان به‌صورت خوشه‌ای مکان گزینی شده‌اند. یعنی با توجه به مساعدت شرایط در مناطق خاصی از استان، تعداد زیادی از آن‌ها در روستاها و در شهرستان‌های مشخص تأسیس گردیدند. این شرایط مطلوب اغلب به نزدیکی به مراکز جمعیتی و بازارها، دسترسی به زیرساخت‌ها، نزدیکی به مراکز سیاسی و تصمیم‌گیری، دسترسی به راه‌های اصلی، دسترسی به مواد اولیه بیشتر و ارزان‌تر مربوط می‌شود. بدین‌جهت در استان گیلان نیز مشاهده می‌شود که بسیاری از صنایع تبدیلی روستای به‌صورت خوشه‌هایی در نزدیکی شهرها بزرگ و مرکزی استان تمرکزیافته‌اند. این شهرها با توجه به دسترسی که برای صنایع در حمل‌ونقل، انرژی، نیروی کار و غیره ایجاد می‌کنند، همواره جاذب صنایع می‌باشند. تحلیل‌ها نشان‌دهنده این موضوع است که اغلب صنایع تبدیلی استان در شهرستان‌های رشت، رودسر، آستارا، تالش، لاهیجان، لنگرود و صومعه‌سرا تمرکزیافته‌اند که شهرستان‌های با وضعیت اقتصادی مناسب‌تر نیز می‌باشند. بنابراین لازم است با توجه به بالا بودن هزینه‌های تأسیس چنین صنایعی ازیک‌طرف و ضعف بنیه مالی روستاییان برای این کار از طرف دیگر، حمایت‌های خاصی از جلب دولت برای تشکیل صنایع تبدیلی که تأثیرات مثبت بسیار زیادی در اقتصاد روستاییان دارد صورت پذیرد. این حمایت حتی می‌تواند به‌صورت کمک‌های مشاوره‌ای و تسهیلگری برای تشکیل تعاونی‌هایی به‌منظور تأسیس صنایع تبدیلی باشد که برخی از نمونه‌های موفق آن در استان قابل‌مشاهده است.

کلیدواژه‌ها: تحلیل فضایی، صنایع تبدیلی کشاورزی، توسعه روستایی، استان گیلان.

تشکر و قدردانی

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