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A Local-Spatial Analysis of the Impact of Livelihood Capitals on the Formation of Social Capital in Rural Settlements (Case Study: Bojnourd County)

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Abstract

Purpose- The study of social capital in the context of location/space is a new approach that is dominated by the science of geography, and is seen as a way of distinguishing it from other sciences. The purpose of this study was to evaluate the impact of livelihood capitals on social capital in rural areas of Bojnourd County.

Design/methodology/approach- This study was a fundamental research, conducted in a descriptive-analytical method. Documentary methods and field works have been employed to collect the data. The population consisted of 22 villages with more than 20 households in Bojnourd County, selected from various population classes and distances from Bojnourd. Using Cochran formula and random sampling method, 298 households were selected from a total of 4849 households in the rural areas of the study area. Partial least squares technique and Smart PLS software were used to test the conceptual model of the research and the impact of livelihood capitals on social capital. Geographically Weighted Regression (GWR) was used to evaluate the model efficiency at Bojnourd County level.

Findings- According to the results, the coefficients of *T* among the main variables of the study were above 2.58, which means the relationship is significant and direct. Thus, local-spatial factors have a significant and positive effect on social capital. Based on total coefficients, human capital with the coefficient of 0.348 and physical capital with the coefficient of 0.136 respectively had the most and the least effect on social capital. The results of spatial analysis using GWR showed that the impact coefficient of livelihood capitals on social capital was highest in the villages of Atrabad Olia and Gharajeh, and in total about 45% of villages in the study area had an impact coefficient of 0.90 to 0.91.

Research limitations/implications- As the study of livelihood capitals and analysis of their relationship with social capital is a fundamental challenge in achieving sustainable rural development that is missing in current studies, it is recommended that future studies pay more attention to social capital and the impact of livelihood capitals on its creation and rural development.

Practical implications- Rural areas suffer from the lack of social capital, which is one of the most important types of development capital required to achieve sustainable rural development. Thus, enhancing the social capital and informing the villagers about the value and importance of local-spatial factors and the material and non-material capitals available in rural areas should be on the agenda of rural development researchers and planners.

Key words- Social capital, Livelihood capitals, Structural equations, Geographically weighted regression, Bojnourd County.
Paper type- Scientific & Research.

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1. Introduction

Social capital is a set of valuable resources that are potentially available in the social relations of the first, and secondary groups, and social organization of a community. Today, social capital is viewed as one of the components of a nation's wealth and sustainable development, one of the tools of community capacity building, a measure to prevent and reduce social issues and a factor in the success of social welfare programs and the promotion of social and personal health (Heidari Sareban, 2014, cited in Tawalaee and Sharifian Sani, 2005). Despite the issues identified in defining social capital, it cannot be denied that social capital thought is an approach to eradicate poverty and increase household welfare in underprivileged areas, especially in poor rural areas of developing countries (Mahmoudi & Roknioddin Eftekhari, 2017); therefore, to have an understanding of this issue is particularly important for gaining an insight into the link between social capital and rural household welfare, not only because of the concepts discussed in relation to local/rural community development, but also to improve a useful conceptual framework for creating more effective strategies in the development of the local/rural community (Moridsadat, Zare Khalili & Farhadi, 2017). The social capital of a village represents part of the human potentials of that village, and any plan for development needs to explore the social capital of the area. Given the effect of social capital on rural development, there is no doubt that rural communities, like any other communities, develop more significantly through trust and partnership.

On the other hand, the study of social capital in the context of location/space is a new approach that is dominated by the science of geography and is regarded as a distinction point with other sciences. Some sociologists have pointed out in their studies that social relationships are built in space. In other words, a society is essentially constructed spatially, and the spatial organization of the society plays a role in how a society operates. Thus, spatial analysis of the social capital as a gap in the study of this concept led us not only examine the quantity and quality of social capital, but also conduct a local-spatial analysis, and rank it in rural areas as a landmark in the study of this concept. Therefore, location and space are effective in the quality and quantity of the social capital, and development would be inefficient unless geographical dimensions of social capital are taken into account. As mentioned above, rural sustainable livelihood models include five key components of human, social, natural, physical, and financial capitals whose improvement are required to achieve sustainable livelihoods (Abdollahzadeh, Salehi, Sharifzadeh & Khajeh SHahkohi, 2015); in this respect, it can be said that in the absence of social capital, other capitals lose their effectiveness and without social capital, pursuing the paths of cultural and economic development would be quite difficult. Social capital is a central principle for achieving development (Heidari Sareban, 2014).

Therefore, this study investigates the status of social capital in rural settlements of Bojnourd County and the impact of livelihood capitals on the formation of social capital in the sample villages. In addition, the status of social capital and the amount of livelihood capitals of each village along with the ranking of the villages have been examined.

The main question of this study is how the livelihood capitals (human capital, natural capital, physical capital, economic capital and institutional-managerial capital) influenced the formation of rural social capital in the study area, and what the local-spatial differences are at the regional level.

2. Research Theoretical Literature

Social capital consists of two words: social and capital. These two words indicate that, first of all, this concept has a generative nature, and secondly, it is not an individual one (Alibeigi, Aliabadi & Geravandi, 2012). The term social capital was first coined by Alfred Marshall in 1890 (Eynali, Farahani & Jafari, 2014). However, the concept of social capital in its current sense was, for the first time, used by Lida G. Hanifan in 1920 (Mousavi, Hasani & Manouchehri, 2012). After Hanifan, the idea of social capital disappeared for some decades; however, it was re-introduced in the 1950s by a group of Canadian sociologists and in the 1960s by a theorist known as Homans (Barati & Yazdanpanah Shahabadi, 2011). Jane Jacobs also coined the term social capital in 1961 in her classic work "*The Death and Life of Great American Cities*" (Fukuyama, 2000). The first unified explanation for social capital was made by Pierre Bourdieu in 1972 (Salari Sardari, Beyranvandzadeh & Alizadeh, 2014), and in the

1980s the term was used in a broader sense. Robert Putnam, an American political scientist, was the next who had strong discussions on social capital and civil society, both in Italy and the US (Fukuyama, 2000).

There are many theories and approaches to social capital some of which are reviewed in the following lines:

Pierre Bourdieu: In Bourdieu's view, social capital is a kind of social product that comes from the social interaction. His focus was on individual participation in social networks where his participation gives access to the resources and facilities of a group.

Francis Fukuyama: He placed a strong emphasis on informal norms and values in a group. In his view, the norms that produce a capital should, in principle, consist of virtues such as honesty, commitment, and two-way communications.

Robert Putnam: He emphasized the concept of trust, and views social capital as a set of concepts such as trust, norms, and networks that contribute to the optimal partnership and participation of members of a community and ultimately provide their mutual interests (Abolhassan Tanhaee & Hazrati Som'e, 2009).

A review of the existing literature on social capital shows that following components and indicators can be examined in this context:

1. Social participation: It implies the development of inter-group relationships in the form of voluntary associations, clubs, unions and groups that usually are local and non-governmental in nature, whose aims include encouraging popular participation and engaging people in different social processes in the form of social policies (Heidari Mokarar, Sheybani Shad, Mohammad zaieerad & Ghader Shafagh, 2015).

2. Social cohesion: It is a kind of feeling of communication and engagement with others; it means a sense of mutual responsibility between some groups of people.

3. Social trust: It is an essential prerequisite for social capital to occur; as an inherent component, it provides the norms that are created as a result of social networks (Field, 2007). Social trust is based largely on the stereotypes and perceptions that individuals have about each other and entities associated with their social life (Kiani & Mirzapour, 2009).

4. Social awareness: Concepts related to the component of knowledge and information on social capital at the rural level are defined according to the existing definitions of knowledge centrality as applied and organized information for solving problems.

5. Social networks: People's social relationships and their interactions with one another constitute the most fundamental component of social capital, and networks are the origin of two other components of social capital, namely trust and partnership norms (Ebrahimzadeh & Zareh, 2014).

A prerequisite for the development of any society, especially rural communities, is the general development of warm relationships, social cohesion, social participation and most importantly, the mutual trust (between individuals, communities, and the government) which are the components of social capital understood in the context of location and space. In this approach, it is essential to understand the status of individuals' funds, the strategies they adopt to make their livings, the outcomes they expect, and the vulnerable context in which they operate. The capitals are an essential component of the livelihood of the people, especially the poor. People need such various capitals to achieve their defined goals (Jomepour & Kiomarth, 2012). Rural sustainable livelihood models include 5 main components of human, natural, physical, financial, and institutional-managerial capitals whose improvement are essential for achieving social capital (Abdollahzadeh et al., 2015). Therefore, in the present study, livelihood capitals consist of 5 main components of financial, human, institutional, natural and physical capitals, which are described below:

1. Natural capital refers to natural resources that can be used by people to achieve their livelihood goals. For example, land, water, and forest are natural resources; natural capital is a term used for the inventory of natural resources, and flows of useful resources and services (such as land, water, forests, air quality, erosion protection, degree of variation, rate of changes, etc.), are derived from it for livelihood (Kollmair & Gamper, 2002; Barimani, Rasti, Reiesi & Mohammadzadeh, 2016).

2. Physical capital refers to essential infrastructures such as roads and waterways, production tools, capital goods (including machinery such as tractors) needed to support livelihoods; Physical capital may refer to a built environment that includes residential houses, public places,

industries, bridges, dams, harbors, and shelters. This capital also includes vital facilities such as electricity, water, telephone and gas (Sojasi Gheidari, Sadeghloo & Shakorifard, 2016, cited in Nakiyimba, 2014).

3. Financial capital refers to the financial resources (such as cash, bank accounts, current assets, pensions, allowances, and remittances) available to maintain current livelihoods or improve people's livelihoods. These assets may be the most important and most accessible asset for the poor; therefore, financial capital refers to the economic resources that people use to make a living. These resources include savings, income, investments, and credit (Sojasi Gheidari et al., 2016).

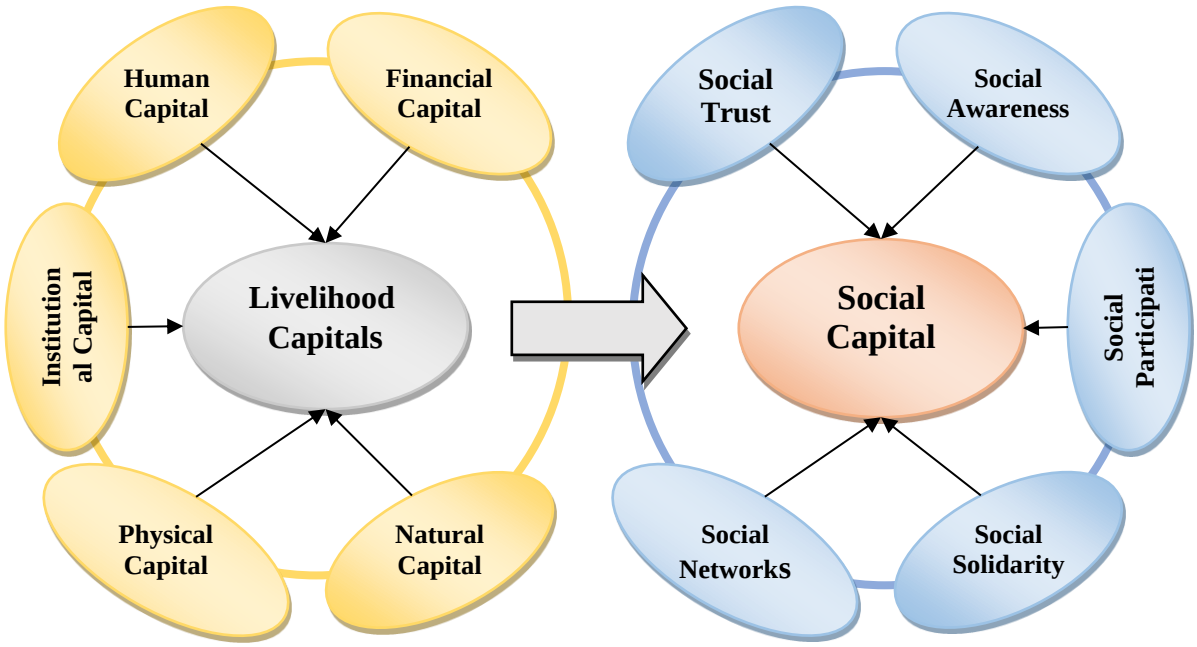

Figure1. Conceptual model of the structural function of the effect of livelihood capitals and its components on the behavior of rural social capital

(Source: Research Finding, 2019)

4. Human capital refers to skills, good health and the ability to work that totally make it possible for individuals to pursue different livelihood strategies and activities and achieve their livelihoods; human capital is a form of capital that is acquired by changing individuals to get skills and abilities, and enable the individuals to behave in new ways. Thus, human capital may include the labor force, health, skills and knowledge of the individuals (Karami Dehkordi & Ansari, 2012; Mphande, 2016).

5. In institutional-managerial capital, management of resources and capitals has two essential principles: government and people. The government has an important role to play in facilitating partnerships by providing infrastructure, laws, and funding. (Beheshti Seresht, Samari & Mirdamadi, 2009).

There is an extensive literature on social capital, which has looked into the subject from different perspectives. Here goes a summary of some recent research on social capital:

Prayitno, Matsushima, Jeong & Kobayashi (2014) used questions such as community feeling, empowerment, neighborly behaviors, and participation in social activities to measure the level of social capital, and the results showed that 'sense of place' and 'social sense' and some demographic characteristics significantly affect migrant workers. In addition, people whose friends and relatives have already migrated are more likely to migrate (a network of relationships). Yoon, Yun, Lee & Phillips (2015) used three structural, cognitive, and relational indicators to measure the extent of social capital and its effects on entrepreneurship, and the results show the positive effect of social capital on entrepreneurship

development. Kirori (2015) found that households with a higher social capital have a better livelihood in terms of product output. Sharifi and Nooripour (2018) argue that among the five types of capitals, physical capital was the first priority, and human, natural, and social capital are the next priorities, respectively.

In recent years, social capital has also received much attention from Iranian scholars and theorists. Studies conducted by Salehi Amiri & Amirentekhabi. (2013), Nasrollahi and Islami (2013), Salari Sardari et al., (2014) and Roumiani, Anabestani & Velaiee. (2015), indicate the direct and significant effect of social capital on variable dimensions of sustainable development. In addition, the level of social capital and participation in rural settlements was higher than urban settlements as a local indigenous factor in the process of regional development, which is more effective in advancing the objectives of the regional sustainable development process. Ghorbani, Evazpour & Siramirad. (2018) in Reagan County, Kerman Province, in order to analyze and evaluate the effects of intragroup social capital on sustainable development, examined the trust relationship and participation in the stakeholder network using direct and indirect observation, network analysis questionnaires, and interviews with all stakeholders. The results indicated a moderate level of trust, participation, and social capital prior to the implementation of the local community empowerment project, which has since increased and reached a desirable level. Heidari, Zarafshani & Moradi, (2015) believe that what distinguishes Farsinaj village in Kermanshah province in terms of development is the indigenous model of rural development which is based on out-group social capital. Roknoddin Eftekhari, Mahmoudi, Ghaffari & Poutaheri, (2015) explaining the spatial pattern of social capital in sustainable rural development of Khorasan Razavi province found that there is a statistically significant relationship between the natural position of the villages and their distance from cities, and the spatial pattern of the social capital. Anabestani, Khosrovbiegi, Taghilou & Zareie, (2013) believe that social capital, with the determination coefficient of 0.743, had the greatest effect on the participation rate in rural areas; Ghadiri Masoum, Rezvani, Jomepour & Baghiyani, (2015) and Sojasi Gheidari et al., (2016) found that social assets have been more influential than other livelihoods. Moridsadat et al., (2017) and Sharifi, Nooripour & Karami Dehkordi, (2017) show that among livelihood capitals, three types of capitals, including social capital, human capital and physical capital are at the moderate level of sustainability, and financial and natural capitals are in a potentially unstable situation. Mahmoudi & Roknoddin Eftekhari (2017) believe that rural areas suffer from a lack of social capital, which is an effective way to achieve sustainable rural development. Part of the spatial inequality of social capital in the villages of the study area is due to the differences in the amount of intragroup and out-group social capital.

Although studies on social capital and rural development are not scarce, they are mainly single-minded and limited to a few components of social capital, so in an integrated and holistic perspective, they highlight shortcomings. An analysis of the studies reveals that most of them have mainly looked into the subject from a sociological perspective; in addition to the fact that many types of capitals (including social capital, physical capital, human capital, natural capital, and economic capital) alone play a significant role in achieving social capital, they affect each other and even are convertible to each other. It is also important to study the types of development capital and analyze their relationship with social capital, which is missing in the current studies. Therefore, considering the issues raised and identifying the main gap, the present study, with an integrated and holistic view, seeks to study the relationship between different types of development capital and social capital.

3. Research Methodology

3.1 Geographical Scope of the Research

Bojnourd County, situated in Northern Khorasan has an area of 6563 square km, and borders Turkmenistan to the north, northeast and north-west, it is bordering Maneh and Somalgan to the west, Jajarm County to the south, Esfarayen County to the south, and Shirvan County to the southeast and east. It has five rural districts (Dehestan) and two districts known as Markazi and Garmkhan (Figure-2). The population of the study included rural settlements of this county, which according to the National Census 2016, was comprised of 150 villages with a population of 105378 people, out of which, 135 villages have more than 20 households (with a total population

of 104605). To study the spatial analysis of the effects of livelihood capitals on social capital in rural settlements of Bojnourd, the sample size was determined using the Cochran formula with the coefficient of precision 0.2; Twenty-two villages having a population more than 20 households were selected. To select the villages under study, stratified sampling method was used to ensure error reduction and the statistical representation of the sample population. Systematic sampling was used to select sample villages from within the classes (considering the length of each class and the number of samples in the same class (k= N/n). In selecting the first sample in each class, spatial distribution of the samples in each rural district and distance from the center of Bojnourd County was taken into account. Considering the household size of 22 villages and using Cochran formula at the error level of 0.055, the population was comprised of 298 households. Accordingly, to distribute the households in the sample villages with 10 samples as the base for each village, the remaining households were distributed proportionally (Table 1).

Table 1. Number of samples from each village and the total sample

Row	Name	District	Dehestan	Household	Sample Size	Row	Name	District	Dehestan	Household	Sample Size
1	Asadli	Central	Aladagh	78	11	12	Gharajeh	Central	Badranlou	118	12
2	Reshvanlou	Central	Aladagh	40	11	13	Ostad Teymourtash	Central	Badranlou	83	11
3	Gerivan	Central	Aladagh	765	22	14	Pesarakanlou	Central	Badranlou	77	11
4	Dartoum	Central	Aladagh	306	15	15	Goley	Central	Badranlou	333	15
5	Kalateh Naghi	Central	Aladagh	187	13	16	Bidak	Central	Badranlou	953	25
6	Kalateh Yavari	Central	Aladagh	277	14	17	Naveh	Garmkhan	Garmkhan	118	12
7	Peyghour	Central	Baba Aman	155	12	18	Gheshlag Abdolabad	Garmkhan	Garmkhan	60	11
8	Teraghi Tourk	Central	Baba Aman	243	14	19	Novdeh	Garmkhan	Garmkhan	423	17
9	Koh Kamar	Central	Baba Aman	105	12	20	Pakotal	Garmkhan	Garmkhan	48	11
10	Baba Aman	Central	Baba Aman	199	13	21	Izaman Payeen	Garmkhan	Gifan	115	12
11	Atrabad Olyia	Central	Badranlou	40	11	22	Meyanzou	Garmkhan	Gifan	128	13
Sum										4849	298

3.2. Methodology

The research methodology used in this study, with a geographical approach, is a descriptive-analytical one based on quantitative and qualitative methods. The survey instrument consisted of a researcher-made questionnaire in which social capital was measured in 10 dimensions in the form of 67 items with a 5-point Likert scale, the number of items or questions of each dimension with a varied distinction is defined in the following table. SPSS software was used to assess the validity and reliability of the questionnaire. In this method, using KMO test, the validity of social capital explanatory items is 0.71. According to the results of the structural validity test, Cronbach's alpha coefficient obtained from the questionnaire designed to measure social capital in the villages, is equal to 0.793 and for livelihood capital it is equal to 0.883. Therefore, the reliability or validity of the questionnaire was approved. After collecting and categorizing the data, the descriptive and inferential statistics were used in SPSS software; and Smart PLS software was used to extract structural equation model and determine the effects of livelihood capital and its dimensions on rural social capital. Structural Equation Modeling (SEM) with the ability to analyze the role of latent variables, for multivariate causal analysis and interpretation, examines the linear relationships between the latent variables and observed variables called the Standard Score (SS) which shows the standardization of latent variables and the keeping

of the scale of observed variables. The WASPAS and gray relational analysis (GRA) were also used for spatial analysis and ranking of sample villages. Then, the GWR was used for local-spatial analysis of the effects of livelihood capitals on social capital.

Table 2. Coefficient Alpha of the research instrument
(Source: Authors' Calculations, 2019)

Variable	Dimension	Question	Alpha	Total Alpha
Livelihood Capitals	Human Capital	24	0.782	0.883
	Natural Capital	20	0.616	
	Physical Capital	15	0.892	
	Financial Capital	18	0.732	
	Institutional Capital	7	0.698	
Social Capital	Social Awareness	19	0.816	0.793
	Social Participation	17	0.741	
	Social Networks	20	0.758	
	Social Solidarity	26	0.672	
	Social Trust	28	0.694	
Total		194	0.891	

3.2. Research variables and indicators

In order to select the social capital indicators, they were initially listed by critically analyzing the studies, and in the second step, the primary indicators were screened to identify the items of livelihood capitals and social capital, and then they were limited to main indicators. They were extracted from the questionnaires completed by local population in 5-point Likert scale (very low, low, medium, high and very high).

Table 3. Items and indicators explaining the variable of livelihood capitals
Source: Sojasi Gheidari et al (2016); Sharifi et al (2017); Jomepour (2011); Ghadiri Masoum et al (2015); Jomepour & Kiomars (2012); Mahmoudi & Roknoddin Eftekhari (2017)؛ Kassa & Eshetu (2014); Mthembu (2011); Fang, Fan, Shen & Song (2014); DFID (1999a); Ellis (2000); Ashley & Carney (1999); Soini (2005); Paszek, Gurecky & Prokop (2011); Shen, Hughey & Simmons (2009).

Dimensions	Indicators	Items
Human Capital	Manpower	Adequate population, number of young population, population growth rate
	work force	Active rural population, sufficient working population, inexpensive and efficient labor force
	Skills	The presence of experienced people in the activities, participation in courses of vocational education, job skills, the ability to transfer skills to others, interest in learning new skills
	Educated people	People with university degrees and higher education, rural literacy and women's literacy rate, head of households' education
	access to information	Access to publications and the Internet, the media, being familiar with the new sources of information, product marketing and introducing the attractions on the Internet
	Innovations	Interest in doing innovative activities, to enjoying making new things, and the amount of initiatives the villagers set up
Financial Capital	Access to capital	Average assets of households, loans received from relatives and friends, average savings in cash, satisfaction with the savings, owing a private house and the quality of housing, type of vehicles, number of vehicles, the total value of the vehicles
	Access to financial facilities	The priority of the villagers in getting banking and credit services, different backgrounds in receiving low-interest bank loans, the ability to repay the loans
	Production Resources	Access to inexpensive land and water, and the variety of products
	Good economic opportunities	Good employment opportunities for the youth, diverse employment backgrounds, job satisfaction, low-cost rural economic facilities (land, water, labor)

Dimensions	Indicators	Items
Natural Capital	agricultural land	Having fertile land, sufficient area of land, the use of manure, protective plowing, to welcome the integrating projects and land leveling
	Livestock breeding	Active animal husbandry, sufficient number of livestock
	Vegetation	The diversity of vegetation, the use of wood for fuel, the use of pastures for collecting medicinal plants, the use of pastures for hay and grazing
	Natural resources	No limitations in spatial development, access to ground water and wells, access to rivers and springs
	Environmental Health	Contamination of water resources, landfill and waste management systems
	The Natural landscape	rustic green spaces, clear and blue sky, and beautiful landscapes
Physical Capital	Infrastructure	basic facilities (water, electricity, gas), internet, telephone and good cell phone signal strength
	Social services	Access to educational, health, and recreational services
	Access	Suitable roads, easy access to nearby villages and towns, easy access to markets, access to public transportation
	Activity Tools	Having enough agricultural machinery, and access to garage to fix them
	Residential space	Multi-functionality of residential space, quality of housing, housing facilities, access to essentials of life
Institutional Capital	Local entities	Local management support (rural mangers) from activities, support of family members for new businesses, no social opposition to new businesses; rural cooperatives
	Government institutions	Government support for the villages, banks giving priority to the villagers, government support for rural businesses

Table 4. Items and indicators explaining the variable of social capital

Source: Faraji Sabokbar, Rezaiee & Gholami (2015); Anabestani (2014); Moridsadat (2014); Mousavi (2006); Farahani, Eynali & Abdoli (2013); Rokneddin Eftekhari et al. (2015); Motiee Langroudi, Nourbakhsh & Akbarpou Saraskanroud (2012); Khani, Ghadiri Masoum & Malekan (2013); Nasrollahi & Islami (2013); Shabani, Nakhli & Sheykhani (2013); Jomepour & Kiomars (2012); Roumiani et al. (2015); Isanezhad Zarifian, Raheli & Kouhestani (2014); Putnam (2001); Grootaert et al (2004); Giordano, Narayan, Jones & Woolcock (2010); Bhandari (2013); Li, Pickles & Savage (2005).

Dimensions	Indicators	Items
Social Trust	Interpersonal trust	Trust between close acquaintances, family members' trust in each other, villagers' trust in their relatives, villagers' trust in general public, rural farmers' trust in each other, villagers' trust in neighbors, travelers, rural tourists and immigrants
	Collective understanding	The ability of rural people in taking new responsibilities; confidence in individual decision-makings, collective understanding, villagers' trust in strangers, mental and emotional security
	To keep one's promises	To keep one's promises, ethical and personal standards, to bail out one's friends and relatives
	Institutional trust	People's trust in rural authorities (Dehyars, Rural Councils), in conflict resolution councils, in rural social institutions, in rural cooperatives, in rural services centers, in rural social institutions
	Trust in the government	People's trust in government, news and information broadcasted on the national media, instructors of Jihad-e-Agriculture, rural district authorities, government employees, and the police
Social Participation	Mental participation	Collective determination to solve problems, to welcome participation in reconstruction process of infrastructure, willingness to cooperate, collective thinking between government officials, people and experts, readiness to participate in rural affairs without pay
	Objective participation	Participation in rural decision-making, charity activities, training courses, material and spiritual participation in ceremonies, protection of natural attractions ,environment protection activities, consulting with successful farmers, general welfare activities , housing projects

Dimensions	Indicators	Items
	Official participation	Financial and non-financial participation in development projects ,facilitating - promoting program, participation in elections
Social Awareness	Personal-social awareness	Awareness of individual rights, social rights, duties of government and nongovernment organizations, the benefits of the partnership, religious , social and charity activities in rural areas, indigenous knowledge, problems of rural areas, one's abilities, protecting natural, historical, cultural heritage, ecological awareness ,environmental awareness, and the way one can improve the capacity and quality of the ecosystem
	Use of experiences	Collective awareness of the development opportunities , capacity development, recognizing the program objectives, individual's abilities in marketing
	Access to information resources	general reading time, the use of Internet and social media
	Individual abilities and skills	Diversity of activities and risk reduction in agriculture, rural people's ability to use their capacity and that of others, the efficient use of agricultural machinery
Social Solidarity	Respect and Intimacy	Solidarity and sympathy, rapport with the family members, the villagers' respect for each other, the elderly, and rural managers including Dehyars and rural councils
	Conflicts	no conflict between tribes , addressing the rural issues and disputes through talking and negotiation between relatives and friends and interacting with the rural councils, and the elderly
	Commitment	Respect for rural traditions and regulations, Respect for official rules, to feel committed to help others
	Cooperation and interworking	Attending in rural meetings, attending celebrations and mourning, consulting with neighbors, generosity to neighbors, team working, and burden sharing
	Social integration	Class conflicts, people's distress at youth immigration , to prefer living in rural environment to urban ones, paying attention to the common interests of the villagers, interest in starting a business in rural areas rather than urban areas
Social Networks	Family ties	Socializing with relatives, acquaintances, and neighbors, joining informal friendly debt funds, guiding family members when they are in dispute
	Engaging with local and grassroots institutions	To interact with rural managers and councils, membership in cooperatives and attending meetings of rural institutions, attending sports events and informal education courses, to join local traditional groups
	Interaction between Government institutions	Cooperation of government agencies with rural councils, Dehyari and people, communication and interaction with promoters and facilitators, communication with support centers
	Out-group relations	People going to other towns and villages during the week , contact with neighboring villages, going to formal and informal markets

4. Research findings

According to the results, 66.8% of the participants were male and the average age of the participants was 34.48 years, of which 44.6% were in the age group of 31 to 40 years. The findings show that 42.9% of the participants had a high school diploma or a higher degree. 70.5% of the participants were married and 52% of the respondents had agricultural jobs (farming, horticulture and animal husbandry).

4. 1. Survey of rural livelihood capitals in the study area

Indicators of human capital, natural capital, physical capital, financial capital and institutional capital (23 indicators and 84 items) in a 5-point Likert scale were used to measure the livelihood capitals in rural settlements of the study area. According to the research results, from the villagers' view, the level of local-spatial factors in the sample villages, with a mean of 2.64 was in a moderate level, and natural capital with a mean of 2.98 and the institutional-managerial capital with a mean of 2.18 respectively had the highest and lowest level in the villages of the study area. The level of the sample villages. The value of standard deviation also indicates a near dispersion of the data relative to the mean; although, the value of the standard deviation in financial capital is higher

than the other dimensions, and the coefficient of variation of 3.76 confirms the result, the difference between the maximum and minimum amounts of effects on changes was equal to 3.76. (Table 5).

Table 5. The assessment of dimensions and indicators of livelihood capitals from villagers' perspective (Test Standard = 2.5)

(Source: Research finding, 2019)

Dimension	Indicator	Mean	*t*	Sig	Dimension	Indicator	Mean	*t*	Sig
Human Capital	Manpower	3.1	12.07	0.000	Physical Capital	Infrastructure	3.53	18.85	0.000
	work force	2.75	5.98	0.000		Social services	2.84	6.25	0.000
	Skills	3.03	13.46	0.000		Access	2.71	4.99	0.000
	Educated people	2.47	-0.74	0.461		Activity Tools	2.38	-3.02	0.003
	access to information	2.11	-9.25	0.000		Residential space	2.81	7.32	0.000
	Innovations	3.11	10.6	0.000		Physical Capital	2.85	9.66	0.000
	Human Capital	2.76	7.59	0.000	Financial Capital	Access to capital	2.38	-2.96	0.003
Natural Capital	agricultural land	2.73	5.6	0.000		Access to financial facilities	2.39	-2.18	0.030
	Livestock breeding	2.92	7.88	0.000		Production Resources	2.79	4.76	0.000
	Vegetation	3.48	40.5	0.000		Good economic opportunities	2.10	-8.42	0.000
	Natural resources	2.74	7.96	0.000		Financial Capital	2.41	-1.96	0.051
	Environmental Health	2.96	6.73	0.000	Institutional Capital	Local entities	1.95	-12.13	0.000
	The Natural landscape	3.07	10.69	0.000		Government institutions	2.40	-2.4	0.017
	Natural Capital	2.98	17.81	0.000		Institutional Capital	2.18	-8.58	0.000

To evaluate the indicators, the mean of the villagers' views was compared and one sample T-test was used for this purpose. Before the test, the normality of data was confirmed by Kolmogorov-Smirnov test. Therefore, given the Likert's five-point scale in research questions, 2.5 was chosen as the theoretical median for assessing the indicators of local-spatial differences. Based on the results of t-test, the statistic value in all indicators is higher than the average value (i.e., 2.5). The indicators of vegetation (T=40.5), infrastructure (T=18.85), skills (T=13.46) are important indicators in determining the variable of rural livelihood capitals, because T statistic and significance level of 0.000 in these indicators, is less than 0.05. As the mean is greater than 2.5, with a confidence level of 95 percent, we may conclude that in the sample villages these indicators are in a more favorable conditions from the villagers' view. Given the value of the T statistic, from the villagers' view, the indicators of government institutions, access to information and economic opportunities are not in a good condition. It should be noted that the level of significance for the education indicator is not significant (Table-5).

In the spatial distribution of the mean variable of research, i.e., livelihood capitals at rural level, the villages of Bidak with 3.29 and Baba Aman with 3.18 had the highest statistics, and the villages of Meyanzou, Pakotal and Atrabad Olia respectively

showed the lowest statistics. The villages of Bidak and Baba Aman averaged more than 3 in all indicators except for institutional-managerial capital. Indicator of natural and physical capital in sample villages had a better condition. As in natural capital, eight villages and in physical indicator, seven villages have an average higher than 3 and are in more favorable conditions. The results show, all villages in better conditions, have shorter distance from Bojnourd, which makes it easier for them to access facilities and livelihoods. Gray relational analysis technique and multi-criteria decision-making models were used to determine the level of livelihood capitals in the sample villages. As noted above, GRA was performed by coding in MS Excel. The capital used are: human capital, natural capital, physical capital, financial capital, institutional-managerial capital. Shannon entropy technique was used to determine the weights of each of the indicators used. Based on the existing relationships and the final weights of the decision indicators, the weighted score of each village is presented in Table 6.

Table 6. Spatial analysis of livelihood capitals in the villages of the study using GRA technique
(Source: Research finding, 2019)

Row	Name	Mean	Score	Rank	Row	Name	Mean	Score	Rank
1	Gheshlagh Abdolabad	2.75	0.465	6	12	Koh Kamar	2.74	0.451	7
2	Asadli	2.33	0.319	18	13	Meyanzou	2.23	0.302	22
3	Baba Aman	3.18	0.880	2	14	Naveh	2.42	0.363	12
4	Bidak	3.29	0.979	1	15	Novdeh	2.61	0.413	9
5	Dartoum	2.28	0.314	19	16	Atrabad Olyia	2.28	0.312	20
6	Gerivan	2.50	0.360	13	17	Pakotal	2.28	0.311	21
7	Gharajeh	2.44	0.350	14	18	Pesarakanlou	2.41	0.338	17
8	Goley	2.45	0.348	16	19	Peyghour	2.59	0.395	10
9	Izaman Payeen	2.40	0.349	15	20	Reshvanlou	2.98	0.610	4
10	Kalateh Taghi	2.93	0.581	5	21	Teraghi Tourk	2.53	0.369	11
11	Kalateh Yavari	3.14	0.783	3	22	Ostad Teymourtash	2.68	0.421	8

The final ranking of the villages was based on the GRA model, and Bidak village had the best performance in livelihood capitals; Baba Aman village was the next, and the village of Mianzu was the last. In this regard, the effects of indicators such as short distance from city centers, main roads, the altitude, etc., can be mentioned, as the villages with the highest ranking were closer to the city center and the main roads, and in terms of access to physical, human, institutional and managerial funds are more favorable than villages such as Mianzu and Paktedel.

4.2. Social capital of the rural residents

To measure the social capital of rural settlements in the study area, the dimensions of social awareness, social participation, social networking, social cohesion and social trust were used along with 19 indicators and 110 items in the 5-score Likert scale. According to the results, from the viewpoint of the villagers, the level of social capital in the sample villages with the mean of 2.82 is in medium to high level; then social cohesion with a mean of 3.08 and social awareness with a mean of 2.54, respectively, had the highest and the lowest level in the sample villages. The value of standard deviation also shows the near-to-average distribution of data; however, the value of standard deviation in social trust is higher than the other dimensions. The coefficient of variation of 3.98 for the social trust dimension also confirms this result, namely the difference between the maximum and minimum effects on the changes is 3.98 (Table-7).

To know the status of the research variables in dimensions and indicators, the mean of villagers' views was used in the single sample t-test and theoretical median of 2.5. The normality of the data was confirmed by Kolmogorov-Smirnov test. Based on the results of the one-sample t-test, social cohesion has the highest value of t (t=14.39) at the acceptable level of significance. The value of *t* statistic for the dependent variable, namely social capital, is higher than the theoretical median defined and is 9.54. Based on the villagers' views, all the indicators identified in each of the variables of social capital have a mean higher than the theoretical median (*i.e.*, 2.5) except for the

indicator of access to information resources which had a mean of 2.18. This shows that sample villages are in low level in terms of reading time, the use of internet and social media. The mean of participants' views in four indicators of keeping one's promises, interpersonal trust, respect and intimacy, and cooperation and interworking were better than the other indicators, and the mean of these indicators was higher than 3, showing better conditions of trust and social cohesion in the sample community. The indicators of cooperation and interworking (T=18.97), interpersonal trust (T= 14.03), respect and intimacy (T=13.57) are important indicators in determining social capital variable, as t-statistic and significance level of 0.000 in these indices, which are less than 0.05, and given the respective mean of more than 2.5, with the confidence level of 95%, we may conclude that in villagers' view, these indicators in the sample villages, are in a more favorable conditions. It should be noted that given the value of t statistic, the indicators of access to information resources and the use of other peoples' experiences in villagers' view, were not in a good condition and the mean of participants' views was less than the theoretical median.

Table 7. Evaluation of social capital indicators from villagers' view (Test Standard = 2.5)
(Source: Research finding, 2019)

Dimension	Indicator	Mean	*t*	Sig	Dimension	Indicator	Mean	*t*	Sig
Social Awareness	Personal-social awareness	2.65	3.715	0.000	Social Networks	Family ties	2.88	8.73	0.000
	Use of experiences	2.59	2.102	0.036		Engaging with local and grassroots institutions	2.62	2.908	0.004
	Access to information resources	2.18	-6.846	0.000		Interaction between Government institutions	2.69	4.276	0.000
	Individual abilities and skills	2.75	5.929	0.000		Out-group relations	2.91	10.055	0.000
	Social Awareness	2.54	1.23	0.219		Social Networks	2.77	7.69	0.000
Social Participation	Mental participation	2.65	3.504	0.001	Social Trust	Interpersonal trust	3.13	14.031	0.000
	Objective participation	2.83	8.263	0.000		Collective understanding	2.88	8.047	0.000
	Official participation	2.77	5.566	0.000		To keep one's promises	3.06	11.138	0.000
	Social Participation	2.75	6.29	0.000		Institutional trust	2.86	7.207	0.000
Social Solidarity	Respect and Intimacy	3.2	13.565	0.000		Trust in the government	2.88	8.532	0.000
	Conflicts	2.99	9.968	0.000		Social Trust	2.96	10.90	⋯⋯
	Commitment	2.96	9.889	0.000					
	Cooperation and interworking	3.28	18.971	0.000					
	Social integration	2.95	9.837	0.000					
	Social Solidarity	3.08	14.4	0.000					

In the spatial distribution of the mean social capital at rural level, the villages of Bidak with 3.54, Kalate Yavari with 3.27 and Baba Aman with 3.25 had the highest statistics and the villages of Paktel, Izmanpayin and Atrabad Olia had the lowest statistics, respectively. The villages of Kalate Yavari and Baba Aman had a mean of more than 3 in all indicators, and the village of Bidak had a mean of less than 3 only in social awareness indicator. The findings show the indicators of social cohesion and social trust in the sample villages are in more favorable conditions, as in the social cohesion, 11 villages have a mean higher than 3 and have more favorable conditions.

WASPAS was used to more precisely examine and determine the level of social capital of the sample villages. In the second step, once the status quo matrix has been formed, to standardize it, the indicators should were weighted. In the next step, after calculating the weight of the indicators, in the standardization of the status quo matrix according to the type of indicators (with positive or negative direction), normalization was used. Then, the variance of the initial normalized values was estimated. Then, based on different values of λ, the Qi indicator takes different values. If λ = 0, the WASPAS model changes to the WPM model. And if λ=1, the WASPAS model changes to WSM model. After calculating the optimal value of λ, we put it in the above relation and calculate the score for each alternative and then rank the alternatives accordingly. According to the results, the villages of Bidak, Kalate Yavari and Baba Aman had the highest level of social capital and the villages of Pakotal, Izmanpayeen and Atrabad Olia had the lowest level of social capital (Table 8).

Table 8. Variances calculated for all alternatives and the calculated values of Q and λ
(Source: Research finding, 2019)

Name	Mean	λ	Qi	Rank	Name	Mean	λ	Qi	Rank
Gheshlagh Abdolabad	2.83	0.817	0.217	8	Koh Kamar	2.87	0.819	0.216	9
Asadli	2.61	0.833	0.198	16	Meyanzou	2.43	0.841	0.184	19
Baba Aman	3.25	0.798	0.249	3	Naveh	2.69	0.831	0.204	14
Bidak	3.54	0.789	0.267	1	Novdeh	2.85	0.823	0.216	8
Dartoum	2.62	0.832	0.199	15	Atrabad Olyia	2.41	0.844	0.183	20
Gerivan	2.73	0.827	0.206	12	Pakotal	2.32	0.849	0.174	22
Gharajeh	2.58	0.834	0.196	18	Pesarakanlou	2.70	0.828	0.205	13
Goley	2.60	0.837	0.196	17	Peyghour	2.76	0.828	0.208	10
Izaman Payeen	2.34	0.849	0.178	21	Reshvanlou	3.10	0.805	0.237	4
Kalateh Taghi	3.00	0.811	0.229	6	Teraghi Tourk	2.75	0.827	0.208	11
Kalateh Yavari	3.27	0.797	0.250	2	Ostad Teymourtash	3.08	0.810	0.233	5

4.3. Local-spatial analysis of the effects of livelihood capitals on social capital in rural settlements

To test the conceptual model of research and examine the effects of local-spatial assets on social capital, a Structural Equation Modeling (SEM) technique with Partial Least Squares (PLS) approach and Smart PLS 3 software, a variance path modeling technique, were used. This method is the best tool for analyzing a research in which relationships between variables are complex. In this model, the validity of the questionnaire was assessed by two convergent and divergent validity criteria that are specific to structural equation modeling. Convergent validity refers to the ability of the indicators of a dimension to explain that dimension, and divergent validity implies that research model constructs should be more correlated with their questions than with other constructs (Hulland, 1999). For evaluating convergent validity, we used Average Variance Extracted (AVE) criterion which is for first order variables.

Table 9. Indicators used for evaluating the validity and reliability of the tool of social capital concept
(Source: Research finding, 2019)

Component	Convergent validity	Reputation point			Reliability	
	AVE	Fornell & Locker	Cross-factor loads	HTMT	Cronbach Alpha	Combined reliability
Human Capital	0.574	Verification	Verification	Verification	0.850	0.890
Natural Capital	0.531	Verification	Verification	Verification	0.775	0.712
Physical Capital	0.606	Verification	Verification	Verification	0.837	0.885
Financial Capital	0.771	Verification	Verification	Verification	0.900	0.931
Institutional Capital	0.738	Verification	Verification	Verification	0.767	0.848
Social Networks	0.721	Verification	Verification	Verification	0.869	0.911

Component	Convergent validity	Reputation point			Reliability	
	AVE	Fornell & Locker	Cross-factor loads	HTMT	Cronbach Alpha	Combined reliability
Social Participation	0.830	Verification	Verification	Verification	0.897	0.936
Social Awareness	0.669	Verification	Verification	Verification	0.831	0.889
Social Trust	0.807	Verification	Verification	Verification	0.940	0.954
Social Solidarity	0.728	Verification	Verification	Verification	0.906	0.930
Social Capital	0.761	Verification	Verification	Verification	0.921	0.941

The criterion value for the AVE acceptable level is 0.5 (Magner, Welker & Campbell, 1996), meaning that the latent variable explains at least 50% of its observable variance. As shown in Table 9, all AVE values are for constructs greater than 0.5, and this confirms that the convergent validity of the present questionnaire is acceptable. To assess the model reliability, the Composite Reliability and Cronbach's alpha were investigated. Cronbach's alpha coefficient shows the ability of questions to properly explain their respective dimensions. The composite reliability coefficient also determines the degree of correlation of the questions of a dimension with each other to adequately fit measurement models (Fornell & Larker, 1981). The results are summarized in Table-9. Given that the appropriate value for the Cronbach's alpha and the composite reliability is 0.7 (George & Mallery, 2003), and in accordance with the findings shown in Table 9, these criteria have adopted appropriate values for latent variables, and one can confirm the reliability of the study. To investigate the main hypothesis, namely the effects of livelihood capitals on social capital of the villagers, variance-based structural equation modeling was used. The tested conceptual model is presented in Figure-2.

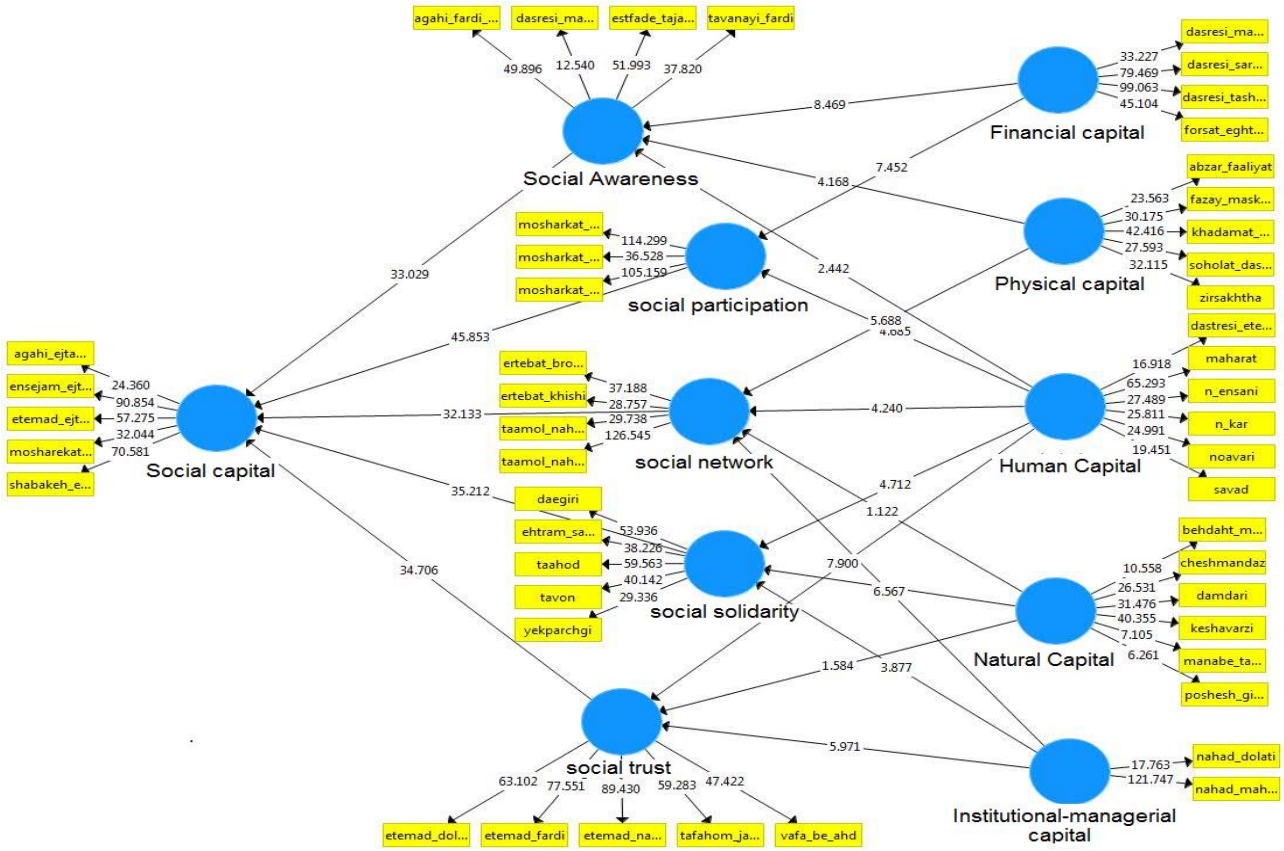

Figure 2. Structural model of the relationship between livelihood capitals and social capital and its relevant components

(Source: Research finding, 2019)

In the above figure, the numbers on the lines are the T values of the Bootstrapp test and are interpreted the same as T test; In other words, if the T values are more than 1.96, they are significant at 0.05 level, and if the values are more than 2.58, they are significant at the 0.01 level (Vinzi, Trinchera & Amato, 2010). As shown in Figure 3, the T coefficients between livelihood capitals and social capital (dependent variable) and its related components are above 2.58; therefore, the relationship between the independent variable dimensions and social capital in the sample population is verified with the confidence level of 99%. In addition, to evaluate the path coefficient, it is necessary to estimate t value for each path. Table 10 shows the values of the path coefficients and the significance level of each path.

Table 10. Evaluation indicators of the research internal model, direction and significance of direct effects among research variables

(Source: Research finding, 2019)

To directly associate variables	Standard beta coefficient	T Statistics (|O/STDEV|)	p-value
Social Awareness → Social Capital	0.006	33.029	0.000
Social Trust → Social Capital	0.006	34.706	0.000
Social Solidarity → Social Capital	0.007	35.212	0.000
Human Capital → Social Awareness	0.058	2.442	0.015
Human Capital → Social Trust	0.062	7.900	0.000
Human Capital → Social Solidarity	0.059	4.712	0.000
Human Capital → Social Networks	0.068	4.240	0.000
Human Capital → Social Participation	0.068	4.685	0.000
Natural Capital → Social Solidarity	0.060	7.162	0.000
Physical Capital → Social Awareness	0.071	4.168	0.000
Physical Capital → Social Networks	0.053	5.688	0.000
Financial Capital → Social Awareness	0.053	8.469	0.000
Financial Capital → Social Participation	0.054	7.452	0.000
Institutional Capital → Social Trust	0.053	5.971	0.000
Institutional Capital → Social Solidarity	0.044	3.877	0.000
Institutional Capital → Social Networks	0.045	6.567	0.000
Social Networks → Social Capital	0.008	32.133	0.000
Social Participation → Social Capital	0.005	45.853	0.000

Given the results of T and P path coefficients, and confirmation of the direct relationship between livelihood capitals and the dependent variable components, the coefficients of direct and indirect effects of the indicators on the dependent variable, i.e., social capital, are also examined. The causal relationship between the latent variables and social capital has been measured in a structural model. The numbers written on the lines are actually beta coefficients of the regression equation between variables, which are the path coefficients. The numbers inside each circle represent the R2 value of the model in which the predictor variables are inserted into the circle via an arrow.The numbers on the path lines and the lines related to factor loadings are indicators. As Figure 3 shows, the five dimensions of the independent variable have no direct effect on the dependent variable, namely social capital, and indirectly affect these indicators through the components of social capital. The relationship between the main construct, the independent variable and the dependent variable, is indirect and significant; according to the standard coefficients, 99% of the effects of social capital in the sample population are directly predicted by the independent variable namely livelihood capital (Table 11).

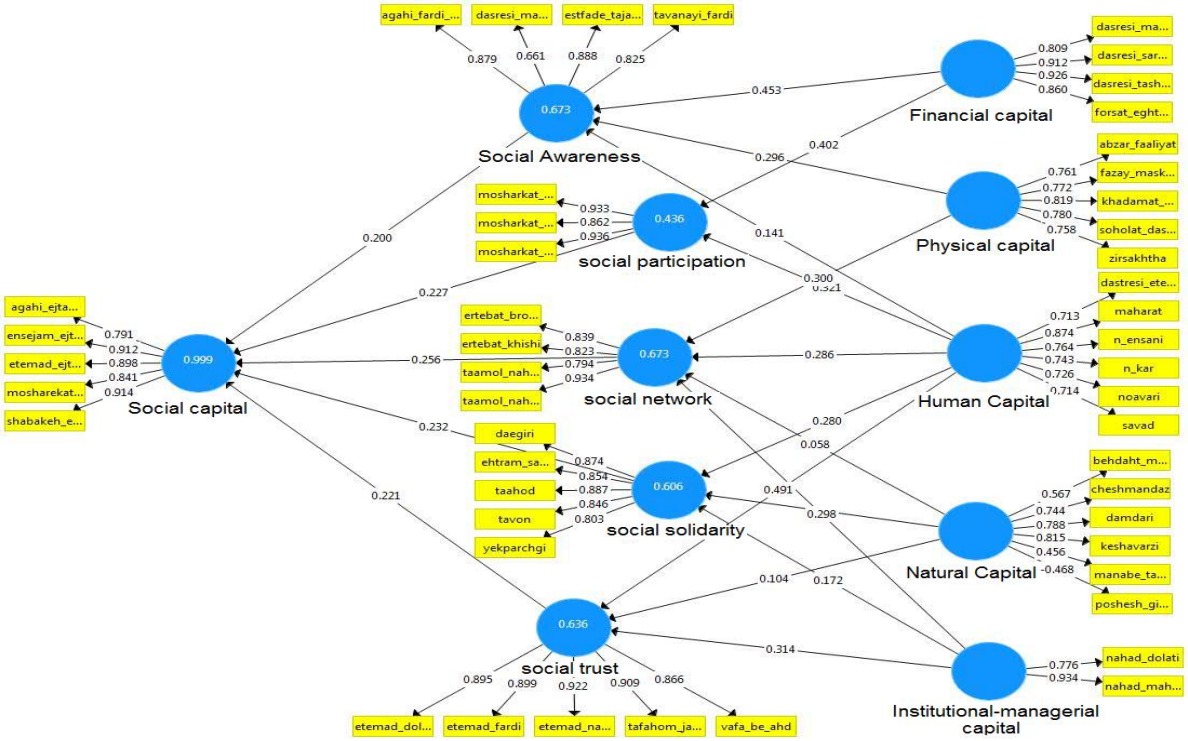

Figure 3. Evaluation of the structural model of livlihood capitals on social capital
(Source: Research finding, 2019)

Table 11. An estimation of the total, direct and indirect effects of research components on social capital
(Source: Research finding, 2019)

Independent variable	Intermediate variable	Dependent variable	Coefficient of determination	Estimate					
				Total		Direct		Indirect	
				Impact	*P*	Impact	*p*	Impact	*p*
Human Capital	→ Awareness, Solidarity, Trust, Participation& Networks →	سرمایه اجتماعی	0.99	0.348	0.000	-	-	0.348	0.000
Natural Capital	→ Solidarity →			0.137	0.000	-	-	0.137	0.000
Physical Capital	→ Awareness & Networks →			0.136	0.000	-	-	0.136	0.000
Financial Capital	→ Participation& Awareness →			0.182	0.000	-	-	0.182	0.000
Institutional Capital	→ Networks, Solidarity & Trust →			0.185	0.000	-	-	0.185	0.000
Social Networks	→			0.256	0.000	0.256	0.000	-	-
Social Participation	→			0.227	0.000	0.227	0.000	-	-
Social Awareness	→			0.200	0.000	0.22	0.000	-	-
Social Trust	→			0.221	0.000	0.221	0.000	-	-
Social Solidarity	→			0.232	0.000	0.232	0.000	-	-

The values estimated in Table 11 indicate that:
Dimensions of independent variable indirectly have affected social capital variable. This relationship between the main research constructs at 95% confidence level is also statistically significant and P is less than 0.05 (p > 0.05), that is, each unit increment of the independent variable (relative to the obtained impact coefficient) increases the dependent variable, and vice versa.
Independent variable indicators (human, natural, physical, financial, and institutional capitals) account for 99% of the variance of social capital, which is estimated large given the magnitude of the effect of the coefficient of determination. In other words, independent variable indicators can, to a large extent, explain the variance of the social capital.
The five indicators of the independent variable only indirectly influenced the dependent variable by mediatory role of the components of social capital, and the indirect effects of the dimensions of the independent variable on social capital was statistically significant (p >0.05).
Finally, considering the coefficients of the direct and indirect effects of research indicators on social capital, it can be said that the effects of local-spatial factors on social capital are positive and estimated to be high; Thus, from the villagers' view, generally the human capital with the coefficient of 0.348 and physical capital with coefficient of 0.136 respectively had the most and the least effect on social capital.
Thus, the main hypothesis of the study is confirmed, that is "livelihood capitals seem to have a significant effect on the social capital of the villagers in the study area". The independent variable has a significant and indirect effect on the social capital.
Evaluation indicators of the total structural equation modeling, also confirm the results, which indicate that the data collected, support the theoretical model of the research; in other words, the fitness of the data for the model is established and all the indicators verify the equation model is favorable. Evaluation indicators of the structural equation model is presented in Table 12.

Table 12: Evaluation indicators of the total structural equation model[1]
(Source: Research finding, 2019)

Indicator	GOF	SRMR	NFI
Value	0.568	0.081	0.912

Geographically Weighted Regression (GWR) is a type of spatial regression that is increasingly used in geosciences and other disciplines that use spatial data and the like. In classic regressions, such as ordinary least squares (OLS) regression, we assume that the relationship we want to model between a dependent variable and a number of independent variables is the same across the study area, which in many cases is not a correct assumption. GWR provides a local model of the variable that we seek to understand or better predict by applying local regression to any of the conditions. GWR does this by preparing separate regression equations for each condition with respect to independent and dependent variables that are within the band or range of the conditions (Asgari, 2011). In GWR, unlike OLS, the coefficients or parameters of the model at the study area are not constant and depend on local conditions (spatial and geographical weight) and the amount and sign of each is spatially variable (Hosseinkhah, Erfaniyan & Alijanpour, 2016).
The most important output values were adjusted in R2 and R2 Geographically Weighted Regression (GWR). These values are 0.936 and 0.935 in the study area, indicating accuracy of the model. The zoning results of R2 results in the area show that its maximum extent (43.9% with distribution in the eastern, southeast and south areas and a narrow area in the north of the County) has a coefficient of impact of 0.91 to 0.90, which has included 45% of the villages and 47.3% of the rural population of the County (table 13 & Figure 4).

1. In variance-based structural equation modeling approach and Smart PLS, the software related to this approach, a small number of total model evaluation indicators are reported.

Table 13. Spatial zoning of the coefficient of impact of livelihood capitals on social capital in the study area
(Source: Research finding, 2019)

Explain	Impact Factor (R^2)	Squar (Km^2)	Village		Population		Sample Villages
			No.	Percent	No.	Percent	
Low	0.875-879	197.6	6	4.6	1712	2	-
Relatively Low	0.89-0.9	226.5	7	5.3	2445	2.8	Meyanzou
Relatively High	0.9-0.91	1411.3	59	45	40769	47.3	Pakotal, Peyghour, Teraghi Tourk, Koh Kamar, Novdeh, Asadli, Reshvanlou, Kalateh Taghi, Kalateh Yavari, Baba Aman, Dartoum, Izaman Payeen, Gerivan
High	0.91-0.915	456.3	27	20.6	27024	31.3	Naveh, Gheshlagh Abdolabad, Pesarakanlou, Goley, Ostad Teymourtash, Bidak
Very High	0.915-0.922	924.1	32	24.4	14298	16.6	Gharajeh, Atrabad Olyia
Sum	-	3215.8	131	100	86248	100	-

On the other hand, border areas with lower impact coefficients of local-spatial factors comprise less than 0.6% of the study area, 4.6% of the number of villages and 2% of the rural population.

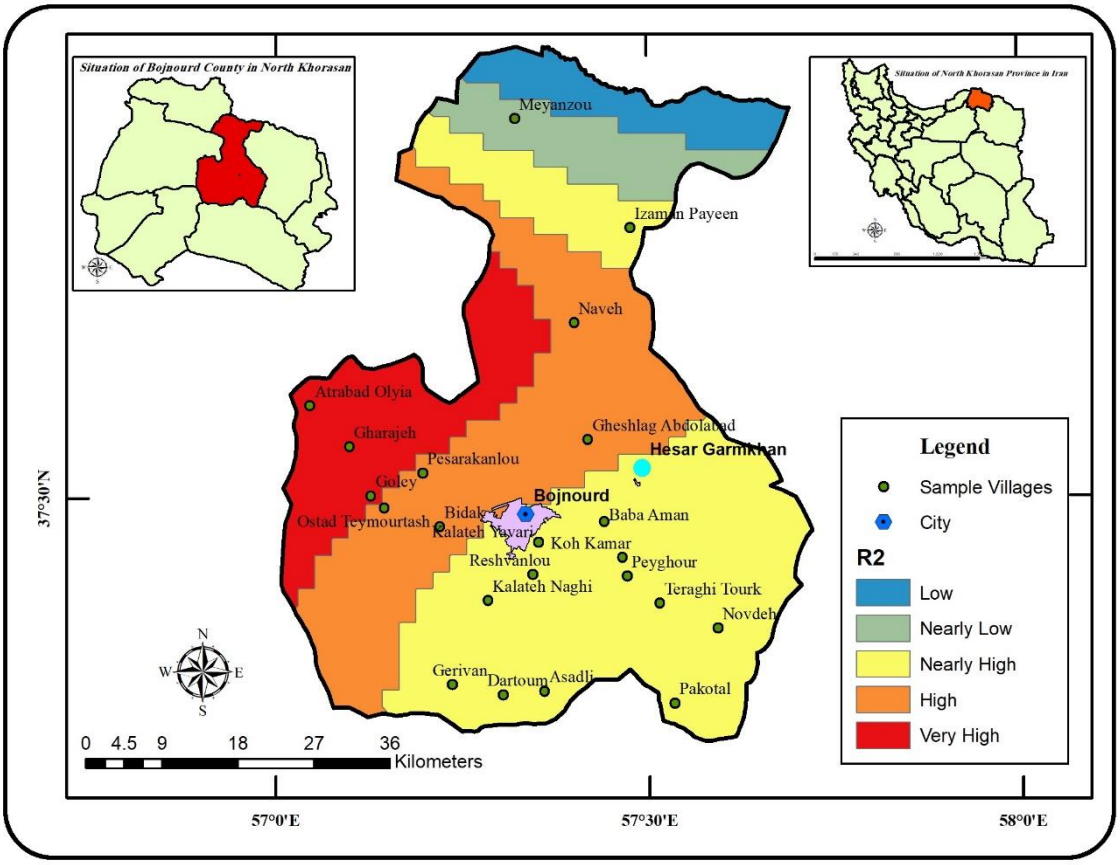

Figure 4. The zoning of the impact of local-spatial factors on social capital in the region
(Source: Research finding, 2019)

5. Discussion and Conclusions

The results show that the level of livelihood capitals in the sample villages with a mean of 2.64 is at a moderate level, and the dimension of natural capital with a mean of 2.98 and institutional-managerial capital with a mean of 2.18 respectively had the highest and the lowest level in the sample villages. This part of the research results is in line with the researches of Moridsadat et al., (2017), Sharifi & Nouripour (2018) and Sharifi et al., (2017); however, they are different from finding of Anabestani et al., (2013), Ghadiri Masoum et al., (2015), and Sojasi Gheidari et al., (2016). According to the results of T test, the indicators of vegetation (T=40.5), infrastructure (T=18.85), skills (T=13.46) are important indicators in determining the variable of rural livelihood capitals. In the spatial distribution of the mean of this variable at the rural level, the villages of Bidak with 3.29 and Baba Aman with 3.18 had the highest statistics and the villages of Mianzu, Paktel and Atrabad Olia had the lowest statistics, respectively. Based on the results of the ranking of sample villages based on GRA model, Bidak also had the best performance in terms of livelihood capitals, Baba Aman was the next, and the village of Mianzu is also at the bottom of the ranking list.

From the point of view of villagers, the level of social capital in the sample villages with the mean of 2.82 was moderate to high; then social cohesion with the mean of 3.08 and social awareness with the mean of 2.54 respectively had the highest and lowest value in the sample villages. Comparing the mean of the participants' opinions with the theoretical median of 2.5, the one-sample T-test results also confirm the above results, as the results show that social cohesion has the highest value of T statistic (i.e., 14.39) at the significant level. The value of T statistic for the dependent variable, namely social capital, was higher than defined theoretical median and is equal to 9.54. Also based on the results of T-test, the indicators of co-operation and interworking (T=18.97), interpersonal trust (T= 14.03), respect and intimacy (T=13.57) are among important indicators in determining the variable of social capital.

The results show that indicators such as participation, trust, cohesion, as well as bonds and interactions in rural areas still hold a special place in rural areas. The results of the present study in the field of spatial analysis of social capital agree with the results of studies conducted by Salehi Amiri & Amirentekhabi (2013), Nasrollahi & Islami (2013), Salari Sardari et al., (2014), Roumiani et al. (2015)., Heidari et al (2015) and Ghorbani et al (2018). In the spatial distribution of mean social capital at rural level, the villages of Bidak with 3.54, Kalate Yavari with 3.27 and Baba Aman with 3.25 had the highest statistics and the villages of Pakotal, Izmanpayeen and Atrabad Olia had the lowest statistics. Besides, the WASPAS was used to more precisely examine and determine the level of social capital of the sample villages and rank the sample villages; accordingly, as the villages of Bidak, Kalat Yavari and Baba Aman had the highest level of social capital and the villages of Pakotal, Izmanpayeen and Atrabad Olia had the lowest level of social capital.

The structural equation modeling technique with the partial least squares approach and Smart PLS software were used for further investigation of the effects of livelihood capitals on social capital. According to the results of external model test, divergent and convergent validity, Cronbach's alpha and composite reliability were confirmed. The internal test of the structural model showed that the coefficients of *t* between the two main constructs of research are above 2.58, indicating that the relationship between the two main constructs of research is direct and significant; and the independent variable indicators (human, natural, physical, financial, and institutional capitals) together account for 99% of the variance of the variable of social capital, which is estimated large given the magnitude of the effect of the coefficient of determination. In general, human capital with the coefficient of 0.348 and physical capital with the coefficient of 0.136 respectively had the most and the least effects on social capital. In other words, the independent variable indicators can greatly explain the variance of social capital variable. The results of spatial analysis using GWR showed that the impact of livelihood capitals on social capital was highest in the villages of Atrabad Olia and Gharajeh and in total about 45% of the villages in the study area had an impact coefficient of 0.91 to 0.90. Therefore, the research hypothesis is confirmed, and the independent variable has a remarkable and significant effect on social capital. Accordingly, the following suggestions can be made:

• The planners should pay attention to available livelihood capitals in rural areas in the process of planning for rural development.
• The villagers should be informed about the value and importance of livelihood capitals (both material and non-material) available in their village and their effects on improving the social capital and rural, regional and national development.
• To meet the economic needs of people living and working in rural areas by diversifying their activities and income resources, particularly through providing a variety of job opportunities, creating wealth, and improving the living standards of rural people, especially those who make their living through subsistence farming.
• To upgrade the facilities of rural areas through the provision of amenities and services, capacity building, enhanced accountability, participation, creating a sense of mutual trust and social cohesion to improve public participation in rural and livelihood development programs that guarantee social sustainability, and improve rural social capital.
• To preserve natural resources, and protect pristine landscapes, biodiversity, rural environment, and promote sustainable use of environmental resources which improves rural livelihoods and enhances rural social capital.

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تحلیل مکانی- فضایی اثرگذاری سرمایه‌های معیشتی بر شکل‌گیری سرمایه اجتماعی در سکونتگاه‌های روستایی
(مطالعه موردی: شهرستان بجنورد)

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چکیده مبسوط

۱. مقدمه

مطالعه سرمایه اجتماعی در بطن مکان/ فضا، نگرش جدیدی است که علم جغرافیا سرآمد آن است و بعنوان وجه تمایز آن با سایر علوم تلقی می‌گردد. برخی جامعه‌شناسان در مطالعات خود اشاره کرده‌اند که روابط اجتماعی، روی فضا بنا می‌شود. به سخن دیگر، جامعه الزاماً به لحاظ فضایی ساخته می‌شود و سازمان فضایی جامعه در خصوص چگونگی عملکرد جامعه، نقشی ایفا می‌کند. بنابراین با الهام از این مباحث، تحلیل فضایی سرمایه اجتماعی، بعنوان شکافی در مطالعه این مفهوم ما را بر این داشت تا ضمن بررسی کمّ و کیف سرمایه اجتماعی، به تحلیل مکانی- فضایی و رتبه‌بندی آن در مناطق روستایی بعنوان نقطه عطفی در مطالعه‌ی این مفهوم بپردازیم. بنابراین مکان و فضا در شـ کل‌گیری کم و کیف سرمایه اجتماعی مؤثر و توسعه بدون ابعاد جغرافیایی آن ناکارآمد است. بنابراین پژوهش حاضر به بررسی وضعیت سرمایه اجتماعی سکونتگاه‌های روستایی شهرستان بجنورد و تأثیر سرمایه‌های معیشتی بر شکل‌گیری سرمایه اجتماعی در روستاهای نمونه پرداخته است و در کنار آن سنجش وضعیت سرمایه‌های معیشتی و میزان سرمایه اجتماعی هریک از روستاها به همراه رتبه‌بندی روستاهای مورد بررسی مورد نظر قرار گرفته است.

۲. مبانی نظری تحقیق

شرط لازم برای پیشرفت هر جامعه‌ای به خصوص جوامع روستایی، توسعه همه‌جانبه، ایجاد روابط گرم، گسترش انسجام اجتماعی، بسط مشارکت اجتماعی و از همه مهمتر اعتماد متقابل (فرد، جامعه و دولت) است که این سازه‌ها از مؤلفه‌های سرمایه اجتماعی هستند که در بستر مکان/ فضا مفهوم می‌یابند. در این رویکرد، شناخت وضعیت سرمایه‌های افراد، استراتژی‌هایی که برای امرار معاش در اختیار می‌گیرند، نتایجی که خواستار هستند و بستر آسیب پذیری که در آن فعالیت می‌کنند، اساسی است. سرمایه‌ها جزء اساسی از معیشت افراد به خصوص قشر فقیر می‌باشند. مردم نیازمند این سرمایه‌های متفاوت هستند تا به اهداف تعریف شده شان برسند. با واکاوی مطالعات صورت گرفته مشخص می‌شود که بیشتر مطالعات عمدتاً از دید جامعه‌شناسی به مسئله پرداخته‌اند همچنین علاوه بر اینکه، انواع سرمایه‌ها (سرمایه اجتماعی، سرمایه فیزیکی، سرمایه انسانی، سرمایه طبیعی، سرمایه اقتصادی) به‌تنهایی در دستیابی به سرمایه اجتماعی نقش و اهمیت قابل‌توجهی دارند، بر یکدیگر تأثیرگذار بوده و حتی قابل‌تبدیل شدن به یکدیگر می‌باشند.

۳. روش تحقیق

روش تحقیق در پژوهش حاضر توصیفی - تحلیلی و نوع آن ازنظر هدف، بنیادی است. برای جمع‌آوری اطلاعات از روش‌های اسنادی و میدانی استفاده‌شده است.

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جامعه نمونه ۲۲ روستای بالای ۲۰ خانوار در شهرستان بجنورد می‌باشد که از طبقات مختلف جمعیتی و فواصل متفاوت با شهر بجنورد انتخاب شدند. از مجموع ۴۸۴۹ خانوار در نقاط روستایی نمونه، با فرمول کوکران، حجم نمونه ۲۹۸ خانوار به‌دست‌آمده این افراد با روش نمونه‌گیری تصادفی انتخاب شدند. برای آزمودن مدل مفهومی پژوهش و بررسی تاثیر سرمایه‌های معیشتی بر سرمایه اجتماعی از تکنیک حداقل مربعات جزئی و نرم افزارSmart PLS استفاده شده است همچنین ارزیابی میزان کارایی مدل در سطح شهرستان بجنورد، مدل رگرسیون موزون جغرافیایی استفاده گردید.

۴. یافته‌های تحقیق

برای بررسی تاثیر سرمایه‌های معیشتی بر سرمایه اجتماعی از فن مدل‌سازی معادلات ساختاری با رویکرد تکنیک حداقل مربعات جزئی و با استفاده از نرم افزار Smart PLS، استفاده گردیده است. با توجه نتایج آزمون بیرونی مدل، مقدار روایی واگرا و همگرا، آلفای کرونباخ و پایایی ترکیبی مورد تایید قرار گرفت. و با آزمون درونی مدل ساختاری تحقیق نیز مشخص شد، ضرایب t بین دو سازۀ اصلی پژوهش، بالای ۲/۵۸ هستند که نشان می‌دهد رابطه بین دو سازۀ اصلی پژوهش معنادار و مستقیم است؛ و شاخص‌های متغیر مستقل تحقیق (سرمایه انسانی، طبیعی، فیزیکی، مالی و نهادی) در مجموع ۹۹ درصد از واریانس متغیر سرمایه اجتماعی را پیش‌بینی می‌کنند که با توجه به مقادیر حجم اثر شاخص ضریب تعیین، این مقدار بزرگ برآورد می‌شود، همچنین در کل سرمایه انسانی با ضریب ۰/۳۴۸ بیشترین و سرمایه فیزیکی با ضریب ۰/۱۳۶ کمترین تاثیر را بر سرمایه اجتماعی دارد. به عبارت دیگر شاخص‌های متغیر مستقل در حد زیادی توان تبیین واریانس متغیر سرمایه اجتماعی را دارند. نتایج تحلیل فضایی با استفاده از مدل GWR مشخص نمود که ضریب تأثیر سرمایه‌های معیشتی بر سرمایه اجتماعی در روستاهای ترآبادعلیا و قراچه در بالاترین سطح قرار داشته و در مجموع حدود ۴۵ درصد روستاها در محدوده مورد مطالعه دارای ضریب تأثیری بین ۰/۹۱ تا ۰/۹۰ بوده‌اند.

۵. بحث و نتیجه‌گیری

نتایج تحقیق نشان می‌دهد سطح متغیر سرمایه‌های معیشتی در روستاهای نمونه، با میانگین ۲/۶۴ در حد متوسط می باشد؛ و بعد سرمایه طبیعی با میانگین ۲/۹۸ بیشترین و سرمایه نهادی-مدیریتی با میانگین ۲/۱۸ کمترین مقدار را در سطح روستاهای نمونه داشته است. ازنظر روستاییان، سطح متغیر سرمایه اجتماعی در روستاهای نمونه، با میانگین ۲/۸۲ در حد متوسط به بالا می باشد؛ و بعد انسجام اجتماعی با میانگین ۳/۰۸ بیشترین و اگاهی اجتماعی با میانگین ۲/۵۴ کمترین مقدار را در سطح روستاهای نمونه داشته است.

با عنایت به اینکه، مطالعه سرمایه‌های معیشتی و تحلیل رابطه آن‌ها با سرمایه اجتماعی بعنوان چالش بنیادین در امر دستیابی به توسعه پایدار روستایی حائز اهمیت است که جای این بحث در مطالعات صورت گرفته خالی ست؛ پیشنهاد می‌گردد مطالعات آتی به رهیافت سرمایه اجتماعی و تاثیر سرمایه‌های معیشتی بر ایجاد آن و توسعه روستایی توجه بیشتری مبذول دارند. مناطق روستایی از کمبود سرمایه اجتماعی که یکی از پراهمیت‌ترین انواع سرمایه‌های توسعه‌ای جهت دستیابی به توسعه پایدار روستایی است، رنج می‌برند، لذا ارتقای شاخص‌های سرمایه اجتماعی و اطلاع رسانی و آگاهی بخشی به روستاییان نسبت به ارزش و اهمیت عوامل مکانی-فضایی و سرمایه های مادّی و غیرمادّی موجود در مناطق روستایی بایستی موردتوجه پژوهشگران و برنامه‌ریزان توسعه روستایی قرار گیرد.

کلیدواژه‌ها: سرمایه اجتماعی، سرمایه‌های معیشتی، معادلات ساختاری، رگرسیون موزون جغرافیایی، شهرستان بجنورد.

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