Original Article

A comprehensive sustainable development framework; community capitals and village-cooperative initiative

Um quadro abrangente de desenvolvimento sustentável; capitais comunitários e iniciativa aldeia-cooperativa

A. Mohammadi[a] 🆔, M. Omidi Najafabadi[a]* 🆔 and A. Poursaeed[b] 🆔

[a]Department of Agricultural Economics, Extension and Education, Science and Research Branch, Islamic Azad University, Tehran, Iran
[b]Department of Agricultural Extension and Education, Islamic Azad University, Ilam, Iran

Abstract

Considering the cooperative sector capabilities in organizing rural people, primarily focusing on empowering manpower and adopting a sustainable approach to basic resources (water and soil), village-cooperative initiative has emerged as a new concept by registering and forming 4565 new cooperatives in Iran's rural regions. The present research which was conducted in two qualitative and quantitative phases designed a new model by integrating the new village-cooperative approach along with the sustainable livelihood's framework theory. The study sample of the qualitative phase included 32 theorists of the village-cooperative initiative. To analyze the data, the grounded theory and three-step process of open coding, axial coding and selective coding were used using MAXqda18 software. Finally, a paradigm model was designed whose most important components included causal conditions (shocks and seasonal conditions), contextual conditions (trends and governmental support), intervening conditions (control and market development), central categories (sustainable livelihoods with a village- cooperative approach), strategies (coping and adaptation) and consequences (creating jobs, establishing cooperatives, supporting smart agriculture and strengthening social capital). The statistical quantitative phase population consisted of cooperatives members in the village-cooperative initiative (N=405), being selected through Cochran's formula with proportional sampling method summing up to198 people from 5 provinces. The data collection tool was a researcher-made questionnaire whose validity and reliability were confirmed. The Bayesian structural equation modeling was used to analyze the data. The results of the research quantitative phase showed that the variables of financial capital, physical capital, social capital, coping and adaptation strategies, human capital and natural capital were the most effective variables on village-cooperative initiative members' sustainable livelihoods, respectively. Finally, a hybrid model based on the qualitative and quantitative studies was designed and suggestions were made; for instance, the creation of suitable grounds for off-farm activities such as rural industries and ecotourism.

Keywords: sustainable livelihoods, village-cooperative initiative, livelihoods asset, cooperative members, sustainable livelihood framework.

Resumo

Considerando as capacidades do setor cooperativo na organização da população rural, focando principalmente na capacitação de mão de obra e na adoção de uma abordagem sustentável para os recursos básicos (água e solo), a iniciativa de cooperativa de aldeia surgiu como um novo conceito ao registrar e formar 4.565 novas cooperativas nas regiões rurais do Irã. A presente pesquisa, que foi conduzida em duas fases qualitativas e quantitativas, projetou um novo modelo integrando a nova abordagem cooperativa de aldeia junto com a teoria da estrutura de subsistência sustentável. A amostra do estudo da fase qualitativa incluiu 32 teóricos da iniciativa vila-cooperativa. Para analisar os dados, a teoria fundamentada e o processo de três etapas de codificação aberta, codificação axial e codificação seletiva foram usados o software MAXqda18. Finalmente, um modelo de paradigma foi desenhado, cujos componentes mais importantes incluíam condições causais (choques e condições sazonais), condições contextuais (tendências e apoio governamental), condições intervenientes (controle e desenvolvimento de mercado), categorias centrais (subsistência sustentável com uma abordagem cooperativa de aldeia), estratégias (enfrentamento e adaptação) e consequências (criação de empregos, estabelecimento de cooperativas, apoio à agricultura inteligente e fortalecimento do capital social). A população da fase quantitativa estatística consistiu de cooperados na iniciativa vila-cooperativa (N = 405), sendo selecionados através da fórmula de Cochran com método de amostragem proporcional totalizando 198 pessoas de cinco províncias. A ferramenta de coleta de dados foi um questionário elaborado pelo pesquisador cuja validade e confiabilidade foram confirmadas. A modelagem de equações estruturais bayesianas foi utilizada para analisar os dados. Os resultados da fase quantitativa da

pesquisa mostraram que as variáveis de capital financeiro, capital físico, capital social, estratégias de enfrentamento e adaptação, capital humano e capital natural foram as variáveis mais eficazes na subsistência sustentável dos membros da iniciativa cooperativa de aldeia, respectivamente. Finalmente, um modelo híbrido baseado nos estudos qualitativos e quantitativos foi desenhado e sugestões foram feitas; por exemplo, a criação de terrenos adequados para atividades não agrícolas, como indústrias rurais e ecoturismo.

Palavras-chave: meios de subsistência sustentáveis, iniciativa cooperativa de aldeia, meios de subsistência, membros cooperativos, estrutura de meios de subsistência sustentáveis.

1. Introduction

Currently, the world's rural population occupies 3.4 billion people of the world's total population (44.29%) living mostly (90%) in Asia and Africa. It should be noted that 99% of the world's starving population live in three regions of Africa, Asia and Latin America (Fang and Cao, 2014). Accordingly, 1.2 billion people subsist on less than $1.25 a day, living mainly (75%) in rural areas. The poor people live primarily in rural areas of developing countries, comprising the most vulnerable groups of people in terms of poverty, malnutrition and literacy. Therefore, the malnutrition is a rural phenomenon (Rodríguez-Pose and Hardy, 2015). Factors that can reduce sustainable livelihoods in rural areas include illness, lack of jobs and sustainable agricultural income, poverty and insufficient knowledge in these areas. Also, natural disasters such as floods, earthquakes, storms, landslides with human and financial losses such as disease, loss of crops and livestock, human and financial capital deprivation disrupt the sustainable livelihood of villagers around the world (Mphande, 2016). Villages that rely on agriculture for their livelihoods have a single-product economy and if they are geographically isolated, they will witness more drastic livelihood changes (Gentle and Maraseni, 2012). Unemployment and financial poverty serve as a major factor for rural migration has led to the villages' stagnation and destruction (Al-Jundi et al., 2020).

Unemployment is a major problem in many industrialized countries today, and solving it has posed great challenges to most countries' policies. This issue has become even more challenging in Iran, so that a study on the rural households' average annual total net cost in 2019 compared to the previous years' shows an increase of about 21.7%. Also, the first 9 deciles of rural spending suffer from food insecurity (Cheratian et al., 2019). Most researchers believe that developing countries, including Iran, are facing widespread unemployment. A statistical study of the unemployment condition in rural areas of Iran showed that among the total active population, 6513188 people are employed in the country' rural areas, which included 28.4% of the country' total working population (Cheratian et al., 2019). A budget bill review for 2020 showed that the calculable credits share for rural and nomadic management was only about 5.8 percent of the total public budget expenditures (Esmaeilizadeh et al., 2020). The migration trend from rural to urban areas in Iran from 2006 to 2016 increased from 74% to 84%, so that the migration slope to cities is increasing day by day (Esmaeilizadeh et al., 2020). The most effective causes of rural migration are economic factors such as unemployment and insufficient income. According to the afore-mentioned statistics, one of the inevitable ways to progress and prevent the rural poverty increase, migration and related issues is to pay attention to the rural households' living conditions. Factors such as urbanization and industrialization processes led to large-scale changes in the rural areas' livelihoods (Liu and Liu, 2016). Along with these changes, climate change, agricultural restructuring and unemployment have affected villagers' livelihoods (Loison, 2015).

Regarding many researchers' and major international development organizations' standpoints for the local communities' development, past and present approaches have not been successful in reducing poverty. Over the past few decades, many approaches have been undertaken by various researchers and institutions such as UNDP, FAO to analyze the livelihoods sustainability. In the meantime, one of the frameworks that can comprehensively explain the people's strategies in vulnerable contexts is the rural sustainable livelihood approach (Tang et al., 2013).

As a part of the continual development of poverty measuring approaches, sustainable livelihood is deemed to be more reasonable, which also covers the multidimensional aspects in tracking poverty. in the mid-1980s, the sustainable livelihoods approach (SLA) is defined to improve its assets under external impacts (DFID, 1999). It has become popular in developing thinking as a way of conceptualizing rural development, poverty reduction and environmental management (Udayakumara and Shrestha, 2011), which is also an asset-based conceptual framework that has been widely used by researchers and policy makers (Shankland, 2000). This framework emphasizes a people-centered approach based on the 5-key components of the sustainable livelihood approach, which include livelihood assets, transformational structures and processes, vulnerability, livelihood outcomes and livelihood strategies. (Peng et al., 2017). At the core of the sustainable livelihood approach are individuals' assets (Morse and McNamara, 2013). In this research, the authors paid a lot of emphasis on the value of these five capitals for the realization and promotion of the village-cooperative initiative. Important reasons for emphasizing on the sustainable livelihoods, especially in remote villages, embrace the environmental resource constraints, low productivity (Garibaldi et al., 2017), agricultural land infertility (Kifle et al., 2017) and climate change events such as floods, droughts, and its possible effects (Lu et al., 2017). Currently, the importance of job creation due to population and unemployment growth rate, on one hand, the economic role of cooperatives along with the human values of cooperation such as justice, solidarity, members participation, on the other hand, highlight the careful consideration and forming cooperatives and creating jobs (International Labour Office, 2008). The businesses activity in the form of

cooperatives has led to an increase in the rural businesses' competitiveness enabling villagers to get the goods and services they need by creating small entrepreneurial companies, and this, in turn, has a great impact on rural economic growth and migration reduction to cities. (Lordkipanidze et al., 2005). Cooperatives, by their very nature, are a vital tool in the local economy development. The development of the local economy signifies that the problems that societies face, such as unemployment and environmental degradation, can be best addressed by the movements of ordinary people (Mensah et al., 2013). Therefore, in recent decades, consistent with cooperatives efficiency, they have been recognized as organizations that have the potential for rapid socio-economic development and poverty reduction (Borda-Rodriguez and Vicari, 2014).

Harper believes that by forming agricultural production cooperatives in rural areas, it is possible to create employment, increase welfare indicators, and create a bridge between villagers and decision-makers by establishing a systematic coordination between production and non-production units (Harper, 1992). According to Article 27 of the Iran's Sixth Development Plan, great importance is foreseen for the development of villages, especially in rural employment, so that the goals of creating at least two million jobs in rural areas are anticipated through cooperative sectors. Accordingly, it seems quite necessary to prepare a plan that regulates the cooperative sector contribution in this program. Likewise, since the end of 2017, the government has taken a new initiative called a village-cooperative initiative aiming at the sustainable employment in target villages to develop and empower rural cooperatives, encourage organized participation and support economic villagers' entrepreneurship being developed and implemented in the form of group participation. This project is one of the new projects to create employment in rural areas, which takes an important step to eliminate rural unemployment,

increase their income, prevent migration to cities and even promote reverse migration to villages by identifying the capabilities in the villages. Establishing such an initiative can reduce production costs for rural farmers and increase their bargaining power to sell their products (Sheikhpor and Salajegheh, 2017).

Consistent with what has been given, it is crystal clear that the village-cooperative initiative is a new plan that aims to create employment and increase the productivity of rural businesses. Although much research has been done on rural employment and cooperatives, but in general, there is no comprehensive model for the development of employment and poverty reduction in the framework of the village-cooperative initiative.

The village-cooperative initiative implementation was one of the key tasks that was implemented with regular planning by targeting the target villages according to the given process in Figure 1.

The target villages were chosen from the villages in the province that had as much advantage as possible in the production of one or more products with a high social responsibility among its residents to participate in the rural project's implementation. Then, in order to form a cooperative in the target villages with the participation of the whole villagers, first the selected facilitators participated in the specialized facilitation training courses and used the available information to prepare an advantageous plan in the form of biographies of the target villages based on the villages' geographical location, demographic context and participation rate, capabilities, natural benefits and potentials of the proposed development projects.

After this process, as shown in Figure 2, the founding board is elected and determined by the consensus of those present who have the most social capital among the villagers. At this stage, the facilitators present the necessary training to empower the founding boards to
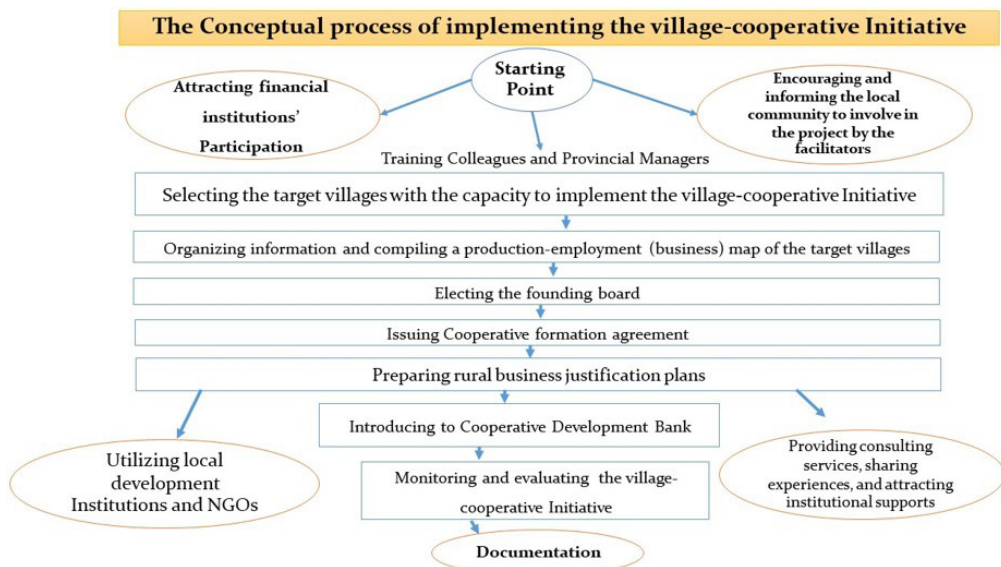
Figure 1. The process of implementing the village cooperative initiative.

encourage and motivate the participation of villagers in cooperatives and collaborate with the founding board in preparing a justification plan for the cooperative's formation in the target villages. Finally, the agreement to form a rural cooperative is issued. Most studies in the field of sustainable livelihoods focus only on the study and evaluation of livelihood capitals and fewer studies have examined other factors affecting sustainable livelihoods such as vulnerability, transforming structures and process. This model is designed and studied in Iran through adopting a mixed-method methodology. Therefore, the present study is considered as one of the most innovative and leading researches in this field due to addressing all the sustainable livelihoods framework factors. Compared to other studies on the framework of sustainable livelihood, such an innovation and creativity can be attributed to the integration of the village-cooperative initiative with the theory of sustainable livelihood framework to implement poverty reduction programs in Iran.

On the basis of the existing literature, this paper has made the following contributions. Firstly, by applying the Grounded theory, we conducted in-depth interviews with cooperatives experts about (vulnerability, transforming structures and process) and built a new model for poverty causes and sustainable livelihoods by introducing the village-cooperative initiative to determine the key influencing factors to sustainable livelihoods. Secondly, on the basis of the conceptual model, we used the Bayesian Structural Equation Modelling to explore the key factors to sustainable livelihoods, providing a theoretical basis and policy recommendations through developing a systemic sustainable livelihood strategy to cope with the complicated problems of farmers and sustainability for the impoverished rural people.

2. Literature Review

Integrating sustainable livelihoods theory with village-cooperative initiative was explored in this study.

Sustainable Livelihood Index (SLI) was used to measure the farmers' welfare and poverty status, and the relationship between livelihood capital and livelihood results was analyzed based on the in-depth interviews with experts of the village-cooperative initiative which measures households' livelihoods levels in all aspects of family structure, education, economy, health and insurance through using some questions.

2.1. Hypotheses

2.1.1. Natural capital

Natural capital and financial capital refer to the production and materials that a household owns. Natural capital is the storage of natural resources and can be used for making a living or a service (DFID, 1999). Land is the major production factor in agrarian rural areas. Access to natural capital like land, fertilizers and rainfall are the crucial factors for the production and sustainable livelihood (Kabir et al., 2012). The establishment of poplar cooperatives in the northern regions of Iran with the local people's participation aiming at developing arboriculture, sustainably protecting the forests and helping to meet the needs of wood and paper industries in some areas can seriously prevent deforestation and logging. Such a measure has led to create sustainable job opportunities, improve sustainable livelihoods for farmers and ultimately minimize the pressure on the forest.

So, the following hypothesis was proposed:

H1: Natural capital had a significant positive impact on sustainable livelihood.

2.1.2. Financial capital

Financial capital comprised flows as well as stocks of capital and it can contribute to consumption as well as production. Agricultural and non-agricultural income can be used for measuring farmers' financial capital (Shahbaz et al., 2013). Financial capital is the main factor that rural household members need to invest in when
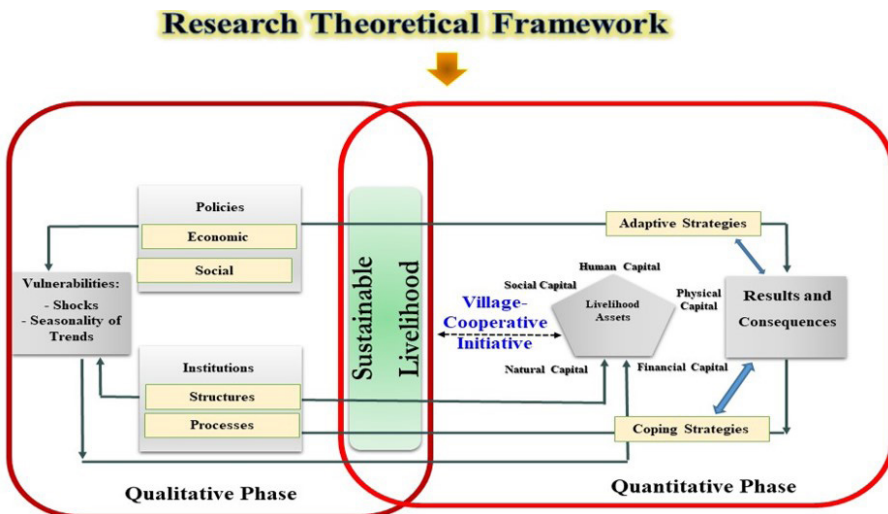
Figure 2. The research conceptual model comprising 2 phases.

adopting various livelihood strategies (Su et al., 2019). Income, savings and loans are the three main sources of financial capital (Liu and Xu, 2016). The formation of cooperatives and self-help groups and the local micro-funds establishment will stabilize the villagers' livelihoods. Rural micro-funds are financial arrangements for the dynamism of the economy of low-income and vulnerable people which encourage money saving to improve the rural households' livelihoods. Cooperatives are one of the tools for poverty alleviation and livelihood improvement and are a solution for the establishment and development of enterprises and small or home businesses, and in short, its consequences embrace improving the livelihoods of the target group, organizing household budget and protecting low-income households 'budgets against calamities and unforeseen factors and seasonal fluctuations in their income.

So, the following hypothesis was developed:

H2: Financial capital had a significant positive impact on sustainable livelihood.

2.1.3. Social capital

Defining a reliable and standard measure of social capital is not a simple task. First of all, there is not a consensus on the fact that whether social capital may be a one-dimensional or a multidimensional concept. Moreover, social capital can be characterized at different levels and for distinct units of analysis: individuals (micro level), organizations (intermediate level) and the whole society (macro level). Putnam et al. (1994) defined the social capital as the 'features of social organizations such as networks, norms, and social trust that encourage co-operation for common benefits. In cooperatives, the guideline is social capital rather than financial capital, for instance, in rural cooperatives, the local people's integration in rural areas is considered as the main cooperative capital. In Figure 3, one of the indicators of the rural micro-fund cooperatives formation is social capital, because it will involve rural people in the development of productive activities as well as distinct cohesive decision-making.

A hypothesis was proposed that the higher the social capital the farmers have, the more support for their living activities and higher sustainable livelihood they will achieve. Hence, we proposed the following hypothesis:

H3: Social capital had a significant positive impact on sustainable livelihoods.

2.1.4. Human capital

Human capital represents skills, knowledge, wellbeing and ability to work. Human capital refers to the labor available to the households: its education, aptitude, and wellbeing (Fornoni et al., 2011). Human capital is a critical and tangible asset, because all other assets are used by humans to maintain their livelihood. Any asset that is utilized or not utilized depends on human aptitudes and needs. Human capital depends on the number of individuals, the ratio of men and women, the education level, occupation and conventional convictions. Krantz (2001) considered the ability to work, education level and job qualification as the foremost critical aspects of livelihood for the human capital dimension. Liu and Xu (2016) believed that the village-cooperative initiative created a structural cooperation in the villages that strengthened the belief of working within the villages among the rural youths instead of low-paying vocations in the suburbs of the urban areas. This imperative point made the adolescents within the village remain lively with a high life expectancy and trust. Therefore, the following hypothesis is proposed.

H4: Human capital had a significant positive impact on sustainable livelihood.

2.1.5. Physical capitals

Physical capitals comprise a capital that is created by economic production process and the basic infrastructure and production of goods needed to support livelihoods (Fischer and McKee, 2017). In this study, road and transport, market facilities, basic facilities, educational facilities, welfare services, communication tools, housing, health-care facilities, and machinery equipment are considered as physical capitals in village- cooperative initiative (Li et al., 2020). Physical capital refers, for example, to infrastructures (transportation, roads, buildings, water and sanitation, energy, and communications) and tools and technology (machineries, production equipment, seeds, and fertilizers) (Serrat, 2017). Physical capital refers to various resources belonging to households including housing, means of
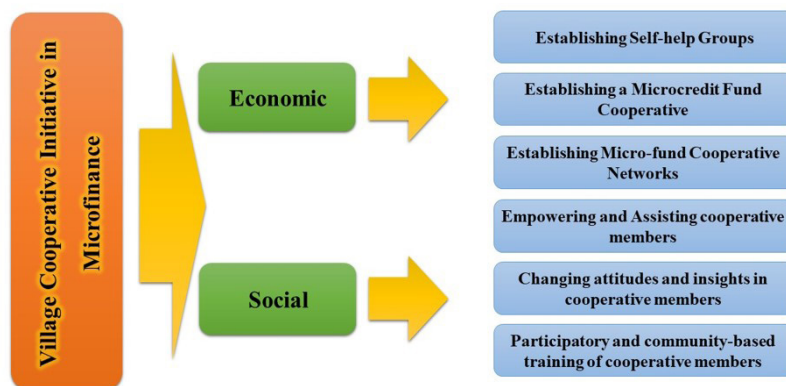

Figure 3. The village-cooperative initiative and rural micro-funds.

production and livelihoods (Su et al., 2019). In addition to their activities, rural development cooperatives also operate and organize rural development. Accordingly, the following hypothesis is proposed.

H5: Physical capital had a significant positive impact on sustainable livelihood.

2.1.6. Strategies

Endeavors were made to change a few of challenges (such as climate change and outmigration) by executing collaborative programs based on 'capacity building' frameworks which were intended to harness local skills and empower communities (Sheikhpor and Salajegheh, 2017). Accordingly, increased endeavors are invested in training local leaders and assisting communities in establishing revenue-generative ventures with a focus on financial self-sufficiency. It is a way of putting individuals in the center of development according to Department for International Development (DFID, 1999). Livelihoods is considered sustainable "when it can adapt with and recover from stresses and stuns and maintain or enhance its assets both now and in the future, while avoiding undermining the natural asset base" (Chambers and Conway, 1992). Nevertheless, this framework has been criticized for overlooking the multidimensionality of livelihoods and for overemphasizing 'capitals. Su et al. (2021) inquired for a more 'holistic understanding of livelihoods' that goes 'beyond the economic or material objectives of life and includes non-material aspects of well-being. Hence, the pursuit of goals is related to alternative economic systems, grounded in cooperation instead of in the pursuit of narrow, individual self-interest, and livelihood strategies that involve permanent or temporary migration, the use of varieties compatible with climate change, the application of smart climate agriculture, the adoption of new methods of agricultural management, irrigation management, conservation agriculture, the use of children as labor, the elimination of expenses such as children's education expenses, the adoption of non-agricultural occupations such as handicrafts and ecotourism and the agricultural diversification and emphasis on post-production activities such as processing and packaging. Thus, the following hypothesis is proposed:

H6: Livelihood strategies had a significant positive impact on sustainable livelihood.

3. Methodology

This study aimed to design a model for rural sustainable livelihood based on village-cooperative initiative. Considering the lack of previous studies on vulnerability context and transforming structures and process of Sustainable Livelihood Approach (SLA), the authors decided to use the mixed-method (qualitative-quantitative) design with an exploratory pragmatic approach.

3.1. Qualitative phase

In the qualitative phase of the study, the required data were collected using the grounded theory. Grounded theory is a systematic methodology which involves the construction of hypotheses and theories through collecting and analyzing the data (Husseini, 2022). A study based on the grounded theory is likely to begin with a question. As researchers review the collected data, ideas or concepts become apparent to the researchers. These concepts are said to "emerge" from the data. As more data are collected, and reviewed, codes can be grouped into higher-level concepts, and then, into categories. These categories may become the basis of a hypothesis or a new theory. It allows researchers in different thematic fields to formulate a theory and a proposition instead of relying on existing and undeveloped theories. We used different methods such as related literature and documents reviews, non-participatory observation, and group discussion to develop a questioner and initial questions for the in-depth interviews. The qualitative data were analyzed in the form of three stages of open, axial, and selective coding based on the grounded theory. Coding represents the operation in which the data are analyzed, conceptualized, and reorganized as new methods, and is the primary process for creating theory from the data. In open coding, a code is assigned to every problem related to the samples, and all data are coded. Then, the amount of the similarity and difference of each concept attained in open coding is compared and assessed in the axial coding phase. Finally, a general classification is obtained for all data in the selective coding section. In this study, comprehensive strategies (applying different references, methods, researches, and theories for providing and strengthening evidence) and review or feedback from colleagues, as well as field research observation, interviews recording, and coders agreement were used for validating the questions. Further, the reliability was evaluated through the consensus between data (Five focus groups), researchers (revising the results according to the opinions of several colleagues), and methods (implementing different methods such as observation, interview, documents and records, and questionnaire).

3.2. Quantitative phase

The total population size in the quantitative phase was 405 people. Using Cochran's formula, the sample size was calculated as 198 individuals who were selected by stratified random sampling method based on the conceptual model. The questionnaire was designed to analyze the hypotheses (capitals and sustainable livelihoods paths).

The quantitative phase adopted an applied, non-experimental approach in terms of controlling variables and collecting data. In this study, the Bayesian structural equation modeling method was used. The documentation and field methods were used to collect data. Also, a questionnaire was used as a research tool to collect data. The statistical population consisted of 405 managers of 135 village-cooperative companies implementing the village-cooperative initiative. Accordingly, the statistical sample size was selected as 198 based on Morgan table and the study was conducted in January, February, and March 2020 and 2021. The village-cooperative initiative was used in five designated classes of the country by stratified random sampling method with

the proportional assignment at the level of all cooperative companies. Therefore, based on the geographical divisions, the whole country was divided into five classes (geographical areas) of north, south, west, east and center and a province from each region was randomly selected. To answer the research questions and objectives, a questionnaire was designed as the main research tool where all questions, except for personal characteristics, were formulated in the form of a 5-point Likert scale (1 = completely inappropriate to and 5= completely appropriate). The designed questionnaire consisted of 6 sections as follows: financial, social, human, natural, and physical capitals, and sustainable livelihood strategy with 7, 8, 5, 5, 5, and 6 items, respectively. The supervisors and advisors' views were used to determine the validity of the questionnaire. After the necessary corrections, it was ensured that the designed questions can measure the content and features of the research. To evaluate the reliability, 30 questionnaires were completed by a separate group in a statistical population similar to the statistical population (Alborz province). Then, its Cronbach's alpha value was calculated (a = 0.73 to 0.85). According to the above data, the coefficients value for the sum of variables was acceptable, showing that the applied scales had acceptable validity and reliability. Data analysis was performed using descriptive and inferential statistics. Descriptive statistics used in this study were frequency, mean and standard deviation, and the Bayesian SEM was used to model structural equations using SPSS and AMOS software.

4. Results

4.1. Qualitative phase results

In this study, the codes were extracted by transcribing the recorded interviews, and then, were reviewed line by line in order to identify the key points as instructed by the content analysis protocol. The extracted codes were, then, grouped based on conceptual relationships and common features to form the basic concepts. The following tables were the result of the in-depth analysis of 32 in-depth interviews in the form of focus groups with experts, specialists, thinkers and key informants of cooperative institutes who were involved in the process of planning a village cooperative. The duration of the interviews ranged from 31 to 120 minutes and a total of 1500 minutes of interviews were achieved and the average of each interview was more than 15 minutes per person.

The results of data analysis were presented based on three coding steps. Using this method, a total of 249 open codes and 77 concepts were obtained from 9 transcripts. For instance, some of open coding has been presented in Table 1.

Axial coding is the process of categorizing the identified concepts. In this stage, after careful comparisons of concepts, similar concepts must be placed in the same category. Thus, the process output is a limited number of major categories developed from comparatively large

Table 1. Examples of open coding.

Concept	Open code	Comment of the interviewee
Drought	Damage to crops due to drought	The 17-year drought in the South Khorasan region (east of the country) has had a great impact on people's income and livelihood in this region. In this region, cooperation in areas such as tourism, ecotourism and handicrafts has greatly contributed to the process of creating economic activity.
Forest Analysis	Deforestation / pressure on natural resources	One of the main problems in forested areas is the indiscriminate felling of large forest trees. Planting poplar trees in the form of cooperatives to supply the wood needed by the relevant industries is important to minimize the pressure on the forest.
Desertification	Soil erosion	Desertification in the desert and desert areas of the country is a natural phenomenon that challenges specialists in the field every year. The formation of desertification cooperatives has reduced such a trend in some desert areas of the country
Watershed Management	Floods and run-offs and soil erosion	Watershed management is one of the effective measures to control drought. The establishment of watershed management cooperatives in different areas causes the supply of fresh water resources in villages, regulates the flow of water resources, protects natural resources, supplies energy from water and protects biodiversity.
Seasonal	Seasonal fluctuations	Sudden rise in prices of agricultural products
Social Capital	Participation	In cooperatives, social capital usually takes precedence over economic capital.
Increasing Revenue	Local micro-funds	Steps have been taken to stabilize their livelihoods by forming cooperatives and self-help groups and setting up local micro-funds.
Land Integrity	Micro lands	Lack of efficiency and agriculture non-profitability due to the division of agricultural lands into smaller plots. Paying attention to territorial integrity in the case of rural cooperatives
Waterworks Cooperative	Reduction of water resources / division of water	Limited water resources in the southern provinces. Most villages are dependent on water.
Seasonal Employment	No job creation	The effect of seasonal unemployment conditions on the development process of the village.
Strengthening Participatory Management	Group cohesion	The unity of the villagers and the goals of democracy pursued by the cooperative.

amount of data (concepts) obtained in the previous stage. The purpose of this stage is to identify the relationships between the concepts produced during the open coding stage. In this stage, the researcher defines a set of obtained concepts as a category, and then, relates other concepts of the same meaning to that category. This is usually done according to the paradigm pattern. In the axial coding of this study, 77 concepts, extracted in the previous stage, were placed in nine categories.

Based on the previous two stages results, the last stage of the coding was selective coding and used to formulate a theory. In this stage, researchers have to link the categories based on their understanding of the collected data in order to develop a theory. According to the model presented Factors of market development, government support, financing, trends, vulnerability, efficiency, cooperatives, employment and social capital strengthening are effective on cooperatives.

4.2. Results of the quantitative phase

Findings from the descriptive analysis of the respondents' demographic characteristics (managers of cooperative companies in the village-cooperative initiative) indicated that the majority of respondents, i.e. 54%, were in the age group of 40 to 60 years. The analysis of the respondents' educational status also showed that 63% had undergraduate and postgraduate education. The study of the respondents' cooperation history showed that the majority of the respondents, i.e. 74%, had less than 10 years of cooperation with cooperatives. The study also found that the 68% of male respondents were included in the study.

4.2.1. Bayesian inferential statistics results

In the present study, due to the high number of variables (41 questions), the Bayesian method was used to model the structural equations. It should be noted that since each unknown component had a small share of the sample size, Bayesian analysis method was used in the analysis (Payandeh Najafabadi and Omidi Najafabadi, 2013). Using Bayesian analysis, the path coefficients with 95% confidence interval are shown in Table 2; it can be concluded that as there is no zero value in the confidence interval, all variables are meaningful. The capital amount variable (money, cars, and agricultural machineries) was the most important in sustainable livelihoods. Considering the physical capital, the access level to the communication means was the most important. The natural potentials variable of the village for tourists was the most important in natural capital. In human capital, the variable of interest in doing new things and innovation was the most important. The participation variable in crisis-related activities was the most important in social capital. Considering the financial capital, the degree of stability and continuity in the business was high importance. Irrigation management was the most important in coping strategies.

Using Bayesian analysis, the path coefficients with a 95% credible interval are shown in Table 3. Which can be concluded: given that in the reliable interval, there is no zero; all variables are significant and the financial capital variable is most important in sustainable livelihoods with a cooperative development approach.

5. Discussion and Conclusion

5.1. Qualitative phase discussion and conclusion

Based on the qualitative results, the best strategies were to increase the households' resiliency (vulnerabilities), to adopt the ecotourism activities development strategies and to develop non-agricultural activities such as handicrafts in order to diversify the current stream. It is consistent with the results of the studies Busse et al. (2017) and Peng et al. (2017). Based on the results of this study, it is also possible to understand how cooperatives can effectively contribute to the challenges, especially in terms of social concerns. Employment is a key factor in motivating farmers to locally participate in economic and social activities, which is consistent with the results of study by Idrisa (2012). The results of this study showed that the development of cooperatives can be an important tool to help rural people and reduce poverty and improve job opportunities in this way. The results also showed the effectiveness of microcredit access which helped households to strengthen their resilience, which is consistent with the study by Arouri et al. (2015).

Increasing the income serves as one of the ways to reduce poverty and inequality and improve assets and increase productivity. In order to increase revenue and further prosperity of the activity, measures were proposed to help market development, as the research results and findings by Arouri et al. (2015) and Sultana et al. (2020) confirmed this. The study results indicated that governmental institutions and the public sectors can support cooperatives as democratic enterprises with the support and financial backing to increase the cooperatives sustainability consisting of farmers to facilitate and create better coordination among farmers, suppliers and food processing companies. This is in line with the research findings by Sultana et al. (2020). This study is consistent with the findings of the study by Tang et al. (2013) in terms of strengthening social participation and its effect on improving rural livelihoods which were similar to the results of the study by Deswandi (2017) and Jones and Clark (2013) with more emphasis on social capital. Santos et al. (2020) considered social capital as the most important factors influencing the cooperatives performance. The higher social cohesion of cooperative members, the higher success rate of cooperatives; and the higher success rate of cooperative members, the stronger social cohesion they have, which is consistent with the results of the research on strengthening social capital.

5.2. Quantitative phase discussion

This part of the research was conducted to investigate the effects of the village-cooperative initiative on the livelihood assets of the member families of the village-cooperative initiative cooperatives. In the present study, based on the results, the factors were evaluated in the form of five categories of social, economic, physical, natural

Table 2. Path coefficients and reliable confidence intervals of sustainable livelihoods items.

Path	Path Coefficient	Sig Level at %95
Having access to adequate and healthy food → Sustainable Livelihood	1*	Fixed Coefficient
Proportion of income to expenses → Sustainable Livelihood	0.984	(1.044-0.925)
Basic farm resources Current status → Sustainable Livelihood	0.932	(0.991-0.875)
Participation in cooperative activities → Sustainable Livelihood	1.009	(1.071-0.95)
Properties → Sustainable Livelihood	1.055	(1.118-0.994)
Agricultural products marketing → Sustainable Livelihood	0.913	(0.972-0.857)
The extent of basic facilities such as electricity → Physical Capital	1*	Fixed Coefficient
Having access to communication tools → Physical Capital	2.169	(2.323-2.025)
Having access educational facilities → Physical Capital	2.147	(2.299-2.005)
One's family's access to health services → Physical Capital	2.108	(2.258-1.967)
One's access to welfare services → Physical Capital	2.037	(2.188-1.901)
The amount of fertile land for agriculture → Natural Capital	1*	Fixed Coefficient
Natural villages' potentials for tourists → Natural Capital	2	(2.145-1.863)
Protected rangelands → Natural Capital	1.947	(2.091-1.812)
The extent of land consolidation → Natural Capital	1.878	(2.017-1.747)
Available water resources for agriculture → Natural Capital	1.806	(1.942-1.677)
The ability and skill to do the job → Human Capital	1*	Fixed Coefficient
One's family's skill and education level → Human Capital	1,942	(2.067-1.824)
The ratio of academics to illiterate people in the family → Human Capital	1.955	(2.079-1.837)
Participation rate in technical training courses → Human Capital	1.954	(2.08-1.836)
Interest in doing innovative work → Human Capital	1.972	(2.098-1.853)
Extent of participation in social activities → Social Capital	1*	Fixed Coefficient
Participation rate in cooperatives → Social Capital	2.079	(2.24-1.961)
Participation rate in crisis-related activities → Social Capital	2.227	(2.428-2.133)
Trust level in other villagers → Social Capital	2.102	(2.246-1.968)
Communication with village-cooperative facilitators → Social Capital	2.166	(2.313-2.03)
Rural trustees in villagers' participation of → Social Capital	2.073	(2.213-1.94)
Women's role in village-cooperative initiative → Social Capital	2.049	(2.191-1.916)
People's participation in rural development → Social Capital	1.978	(2.117-1.847)
Cash savings rate → Financial Capital	1*	Fixed Coefficient
Stability and continuity in business → Financial Capital	1.992	(2.126-1.867)
Subsidies for agricultural inputs purchase → Financial Capital	1.626	(1.745-1.514)
The amount of investment in the family → Financial Capital	1.603	(1.719-1.492)
Having access to loans and facilities → Financial Capital	1.755	(1.879-1.637)
The loan utilization to start a business → Financial Capital	1.853	(1.98-1.733)
Insurance coverage in family employees → Financial Capital	1.681	(1.801-1.567)
Permanent or temporary migration → Coping Strategies	1*	Fixed Coefficient
Use of varieties compatible with climate change → Coping Strategies	1.807	(1.946-1.676)
Use of smart climate agriculture → Coping Strategies	1.867	(2.012-1.73)
Adoption of new methods of crop management → Coping Strategies	1.93	(2.076-1.793)
Irrigation Management → Coping Strategies	2.027	(2.177-1.886)
Conservation agriculture → Coping Strategies	1.973	(2.122-1.836)
Using children as a workforce → Adaptation Strategies	1.772	(1.91-1.641)
Eliminating unnecessary costs → Adaptation Strategies	1.6	(1.733-1.476)
The adoption of non-agricultural jobs → Adaptation Strategies	1.799	(1.94-1.666)
Post-production activities → Adaptation Strategies	1.926	(2.072-1.789)

*Fixed coefficient.

and human capitals as the main hypotheses which were developed based on five indicators of sustainable livelihoods and independent variables of the five indicators. Findings indicated that financial capital had a significant impact on sustainable livelihood with village-cooperative initiative. The results showed that financial capital had the greatest impact on sustainable livelihoods with village-cooperative initiative and ranked as the first effective factor. The degree of stability and continuity in business, as one of the items of financial capital, had the most significant role and priority compared to other items in this study, which is consistent with the results of the study by Idrisa (2012)

Table 3. Coefficients and credible intervals of capitals and strategies on sustainable livelihoods.

Path	Path Coefficient	credible intervals
Physical Capital → Sustainable Livelihood	0.402	(0.812-0.003)
Natural Capital → Sustainable Livelihood	0.222	(0.592-0.155)
Human Capital → Sustainable Livelihood	0.256	(0.677-0.154)
Social Capital → Sustainable Livelihood	0.314	(0.831-0.194)
Financial Capital → Sustainable Livelihood	0.419	(0.794-0.038)
Coping and Adaptation Strategies → Sustainable Livelihood	0.292	(0.697-0.107)

focusing on establishing sustainable livelihoods by creating job opportunities. In this regard, the results were in line with the results of the research by Deng et al. (2020) which emphasized the labor force in rural households for sustainable livelihood.

According to the results of the study, physical capital had a significant impact on sustainable livelihoods with village-cooperative initiative. Physical capital had a positive impact on sustainable livelihoods with village-cooperative initiative on cooperative member households and as the second influential factor. The variables of access to communication means, access to educational facilities and family access to health services had the greatest impact on physical capital. This is consistent with the findings of the study by Below et al. (2012). The results of this study also revealed that households' access to infrastructure such as communication facilities and basic facilities affected sustainable livelihoods, which is consistent with the findings of the study by Liu et al. (2020).

The results also showed that the village-cooperative initiative facilitated easy access to urban markets and welfare, health and tourism facilities by helping to develop rural infrastructure and had a positive impact on the other households' livelihood assets application which is in line with the results of study by Liu et al. (2020).

According to the results of the study, the social capital had a significant impact on sustainable livelihoods with village-cooperative initiative. Based on the findings of the study, social capital had a positive effect. The results of social capital dimensions showed that participation in crisis-related activities ranked first. The second rank was related to the people's relationship with the facilitators of village-cooperative initiative, and finally, trust in other villagers had the greatest impact on social capital. The findings of this study indicated the effect of strengthening social participation on rural livelihoods. These findings are consistent with the studies by Deswandi (2017) and Jones and Clark (2013). Also, Idrisa (2012) considered employment as a key factor to motivate farmers to local participation, confirming the results of this study. The results of this study showed that the development of cooperatives can help members of cooperatives as an important tool in reducing poverty and improving job opportunities.

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