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Analysis of the Effective Capitals on the Sustainability of Rural Livelihoods in Kermanshah Province

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Original Research

Abstract:

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Today, one of the key factors in achieving rural development goals is a proper understanding of sustainable livelihoods. Achieving this requires transitioning from traditional livelihood patterns to sustainable rural livelihoods that align with the needs and potential of the area. In this context, sustainable livelihoods are not possible without considering livelihood assets. Therefore, the present study aims to analyze and investigate the impact of effective assets on the sustainability of the livelihoods of rural inhabitants in Kermanshah province. This study is quantitative and, in terms of purpose, applied. Methodologically, it is a descriptive-correlational study. The statistical population of this study consists of 116,022 rural households in Kermanshah province, from which 385 households were selected as a sample through simple random stratified sampling using the Krejcie and Morgan table. For data collection, a questionnaire was used. The validity of the questionnaire was confirmed by experts and professors of the Rural Development and Extension Department, and its reliability was determined in a pre-test using Cronbach's alpha, ranging from 86% to 94%, indicating the high reliability of the questionnaire for data collection. Data analysis was conducted using Smart-PLS and SPSS 26 software. The results indicated that, among the five livelihood assets, rural inhabitants were at a medium level regarding social capital, and at a weak to medium level concerning financial capital. Based on the results, it is recommended that one of the key strategies should be diversifying the economic activities of rural inhabitants. Moreover, appropriate educational mechanisms in various areas should be provided and given attention by those involved in rural development planning.

Keywords: Sustainable rural development, Partial Least Squares, Rural inhabitants, Equation modeling, rural livelihoods.

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Introduction

In developing countries, where 55% of the population resides in rural areas and about three-quarters of the rural population live in absolute poverty, they face limitations such as access to resources and the challenges posed by social, economic, and environmental changes, while

striving to secure their livelihoods (Birtal et al., 2020). Therefore, paying attention to villages as a vital part of achieving development is essential (Massoud et al., 2016). The role of agriculture in providing livelihood opportunities in most rural areas cannot be overstated, and agriculture cannot be considered the sole source of livelihood for rural households (Anang & Yeboah, 2019). In recent years,

climate changes, including water scarcity and drought, have emerged as significant challenges the world faces today (Khosrozadian et al., 2017). These factors have led to agricultural production, economic development, food security, and livelihoods in rural communities in many countries being at serious risk. Major changes in rural thinking have occurred in the past half-century, and the concept of sustainable rural livelihoods has been introduced in developing countries as a potential approach to reducing rural poverty (Ishaghi Milasi & Mahmoodi, 2018; Nourozi & Hayati, 2015).

A livelihood is considered sustainable when it can withstand pressures and stresses, preserve or enhance the abilities and assets of the household, and provide livelihood opportunities for future generations (Das Gupta & Roy, 2017). Therefore, sustainable livelihood is a key goal for the revitalization of rural areas (Li et al., 2020), and one of the essential aspects of rural development is ensuring the continuity of livelihoods, creating employment, and increasing income in rural communities (Rezaei & Jalilian, 2019). There is abundant evidence showing that rural people play a vital role in the sustainable livelihood of households and communities (Su et al., 2019). Hence, achieving sustainable rural development requires sustainable livelihood models that are aligned with the needs of today's rural society (Sojasi Qidari et al., 2016). In this context, the sustainable livelihood approach includes frameworks and tools to address the challenges of rural livelihoods with the aim of improving life and eradicating poverty in rural areas (Su et al., 2016; Horsley et al., 2015). Therefore, strategies for achieving sustainable development encompass a wide range of policies and actions (Sultana et al., 2020).

Rural areas undergo significant spatial changes due to social, economic factors, technological advancements, and especially the various interactions that influence the development process. The interaction between material and non-material elements affecting rural production and lifestyle has led to differences in the level of rural development across various sectors (Walelign et al., 2017; Meskela & Teshome, 2014). Therefore, achieving sustainable rural development requires a swift transition from traditional livelihood patterns to sustainable livelihoods in rural communities that align with the needs of today's society (Alobo Loison, 2015). Livelihoods include various ways of individual, family life, and community needs (Ghadiri Masoum et al., 2014). One of the key necessities in rural development is ensuring the continuity of livelihoods, creating employment, and increasing income in rural communities (Rezaei & Jalilian, 2019). In fact, rural people, by understanding opportunities and utilizing the necessary resources to secure and produce products at the right place and time in rural areas, have a positive impact on the development of rural businesses and the local economy (Arouri et al., 2015). Therefore, by activating the rural population in economic and productive activities through empowering

human resources, increasing productivity in agriculture and animal husbandry, and creating new and diverse jobs while considering market opportunities (Montazeri et al., 2021), it is possible to create the conditions for improving the sustainable livelihoods of rural people (Meskela & Teshome, 2014).

The main goal of sustainable livelihoods is to utilize various resources, including human, social, financial, natural, institutional, and physical assets in rural areas, without harming the environment (Heidari Sarban & Abdpour, 2016). In the livelihood approach, resources are categorized into five groups: human capital (skills, education, and health), physical capital (tools, equipment, transportation, and market access), financial capital (money, savings, access to loans and credit), natural capital (land, water, and livestock), and social capital (networks and associations), which household members have access to or own (Shahrekie & Sharifzadeh, 2015). In other words, the sustainable livelihood framework consists of multiple components, and the appropriate combination of these can lead to the transformation of processes and structures, ultimately resulting in the formation of sustainable livelihood strategies in rural areas (Sebhatu et al., 2020). These assets often form a pentagonal model, which is interconnected, and each one can complement the others. One form of capital may be replaced by others under certain conditions, and improving them is considered necessary for achieving a sustainable livelihood (Jiao et al., 2017). It is evident that rural populations worldwide face different challenges and issues, but identifying and understanding their needs and livelihoods can enhance the quality of life in rural areas and, consequently, enable them to achieve sustainable livelihoods (Mohammadi et al., 2021).

Several studies have been conducted on livelihood assets and sustainable livelihoods, and here are some key findings. Sojasi Qidari et al. (2017), in a study, identified indicators for measuring livelihood assets and prioritized the villages in the Dasht Taybad region. Their results showed that social assets of rural inhabitants were more significant than other assets, followed by physical, financial, institutional, and human assets. Hua et al. (2017), in their research titled "Examining the Role of Livelihood Assets in Sustainable Livelihood Strategies," found that human, natural, and financial assets significantly impacted livelihood strategies. They suggested strengthening financial assets. Mohammadimehr et al. (2022), in a study on assessing the sustainable livelihoods of rural communities in the Oramanat tourism area, found that the highest levels of capital were physical and financial, followed by social capital, while human capital was the lowest (Saeidi Rad et al., 2020), in a study on measuring livelihood assets in the rural areas of Qasr-e Qand, showed that the five livelihood assets in the targeted villages of Qasr-e Qand had an average score of 2.06, indicating that they were at a weak level. Savari et al. (2019) concluded that the economic dimension had the greatest impact on

income distribution and rural living expenses, the social dimension impacted place attachment, security, and social welfare, the environmental dimension affected environmental pollution and land resources, and the institutional dimension influenced cooperation and public participation. Badko et al. (2020), in their study on measuring livelihood assets in mountainous villages of Hormozgan County with a sustainable livelihood approach, showed that the availability of livelihood assets in different areas (human, financial, physical, natural, and social) in the studied villages varied. Due to vulnerability in various areas in recent years, there was a decrease in physical, financial, and natural assets, while social and human assets had increased. Barimani et al. (2016) found that spatial factors impacted rural livelihoods, with the population size and household structure not being significantly correlated with rural living standards. However, literacy rates and migration had a direct and inverse relationship with livelihood levels. They also found a significant positive relationship between economic factors and rural living standards. Wan et al. (2019) demonstrated that higher education, agricultural income, and domestic water consumption had the greatest impact on the resilience of rural households, while farm income, male laborers, and higher education had the greatest impact on the ability of households to improve their livelihoods. Based on this, the current study investigates the impact of asset factors on the sustainability of rural livelihoods in Kermanshah Province.

Methodology

This research is quantitative in nature and, in terms of its goal, is applied, while in terms of methodology, it is descriptive-correlational. The statistical population of this study consisted of 116,022 rural households in Kermanshah province. Based on the Krejcie and Morgan table, 385 households were selected through simple random stratified sampling as the sample size. To collect data, a face-to-face survey was conducted using a questionnaire. In this regard, the research questionnaire, which is related to livelihood assets and their sustainability (including social, financial, human, natural, and physical capital), was designed and developed based on the research objectives, using a five-point Likert scale (ranging from “very low” = 1 to “very high” = 5) to measure the variables. For validity, the questionnaire was reviewed and revised using both content and face validity methods by university professors. Additionally, the reliability of the questionnaire was calculated in the pre-test phase using Cronbach’s Alpha method, which resulted in a reliability of 90% after distributing 30 questionnaires. Furthermore, data analysis was conducted using descriptive and inferential statistics, and Partial Least Squares (PLS) structural equation modeling was applied with the help of SPSS 26 and Smart-PLS software.

Research Findings

1. Descriptive Statistics, Individual and Professional Characteristics

The descriptive findings of the study indicate that the majority of the sample population falls within the 40-50-year age group, with the fewest individuals in the 20-30-year age group. Additionally, the highest percentage of respondents were male, comprising 91.7% of the total sample. Regarding marital status, the results revealed that out of 385 respondents, only 38 individuals (9.9%) were unmarried. Furthermore, the educational level of the respondents showed that the majority (71.8%) had either a high school diploma or a level of education higher than a diploma. These findings suggest that among the study participants, there is potential to enhance awareness and information dissemination to rural households through various educational and promotional methods such as brochures, magazines, newsletters, and pamphlets. The data presented in Table 1 also showed that the majority of respondents (66.8%) did not have an occupation other than farming. Furthermore, the results indicated that the majority of households (34.8%) had 5 members (Table, 1).

2. Prioritization of the items for dimensions of sustainable livelihood capital of rural households in Kermanshah Province

To assess and rank the items related to social capital dimensions, specifically the social trust dimension of rural households, the findings from the coefficient of variation showed that the items “lending money to others when financially capable” and “I trust the members of the village council and village head” were ranked first and second, respectively. In contrast, the item “having a positive view of the trustworthiness of people” was ranked last in importance and priority (Table 2). To assess the social network of rural households, four items were used. The findings from the ranking of these items showed that the items “spending daily time with friends and neighbors” and “level and history of membership in local social groups and cooperatives” were ranked first and last, respectively, with coefficients of variation of 262% and 334% (Table 2). For assessing the social cohesion of rural households, the results from the coefficient of variation indicated that the item “level of visiting and inquiring about each other’s well-being among villagers” had the highest priority and importance, while the item “frequency of conflicts and tribal disputes” was ranked fourth (Table 2). The findings from the ranking of items related to assessing social norms revealed that the items “respecting the elders in the village” and “commitment to the customary system of the village” as well as “respecting local traditions (such as local customs and rituals)” were ranked first and second, respectively. On the other hand, the item “commitment to the customary system of the village in your place of

Table 1. General Characteristics of the Sample Population Based on Gender, Education Level, Occupation, Household Size, and Age Groups

Variable	Category	Frequency	Percentage	Cumulative Percentage	Mode
Gender	Male	353	7/91	7/91	Male
	Female	32	3/8	100	
Marital Status	Single	38	9/9	9/9	Married
	Married	347	1/90	100	
Age	20 to 30 Years	9	3/2	3/2	40 to 50 Years
	30 to 40 Years	53	8/13	1/16	
	40 to 50 Years	168	6/43	7/59	
	50 to 60 Years	98	5/25	2/85	
	60 years and above	57	8/14	100	
Non-Agricultural Activity	Yes	128	2/33	2/33	No
	No	257	8/66	100	
Education Level	Below Diploma	108	1/28	1/28	High School Diploma
	High School Diploma	153	7/39	8/67	
	Associate Degree	71	4/18	2/86	
	Bachelor's Degree	39	1/10	4/96	
	Bachelor's Degree and above	14	6/3	100	
Household Size	3 members	61	8/15	8/15	5 members
	4 members	128	2/33	1/49	
	5 members	134	8/34	9/83	
	More than 5 members	62	1/16	100	

residence” was ranked last in priority (Table 2).

In the social participation dimension, the findings from the ranking of items revealed that the item “level of participation in mourning ceremonies, religious gatherings, and festive celebrations” had the highest importance and was ranked first. In contrast, the item “level of participation in charitable associations, such as helping to build schools, mosques, etc.” was ranked fourth (Table 2). The findings from the ranking of items related to the social awareness dimension showed that the items “level of awareness of religious, social, and charitable activities in the village” and “level of use of mass media (television, radio, etc.)” ranked first and second in importance and priority, respectively. On the other hand, the item “level of reading newspapers, magazines, and non-academic books” was ranked last in priority (Table 2).

The findings from the ranking of the indicators in the human dimension of sustainable livelihoods showed that the indicators “level of skills in performing agricultural and farming tasks” and “ability to cover household health and medical costs” ranked first and second, respectively. In contrast, the indicators “level of creativity in making various things” and “interest and inclination towards entrepreneurship” ranked twelfth and last in this dimension (Table 3). Additionally, the results indicated that in the natural dimension of the livelihoods of the study participants, the indicators “quantity and quality of drinking water in the village” and “evaluation of soil fertility in agricultural and orchard lands” ranked first and

second, respectively. On the other hand, the indicators “access to pastures for grazing livestock and supplying fodder” and “access to river and spring water” ranked seventh and eighth (Table 3). Furthermore, the findings from the coefficient of variation in the physical dimension of livelihoods showed that the indicators “adequate access to communication tools such as phones and mobile phones in the village” and “access to veterinary services when needed” ranked first and second in this dimension. In contrast, the indicators “adequate access to agricultural machinery repair shops in the village” and “availability of sufficient facilities and equipment at home” ranked eighth and last, respectively (Table 3). Moreover, the results in the financial capital dimension of the study participants’ livelihoods indicated that the indicators “how much access do you have to bank loans and credits?” and “to what extent can you obtain family or local interest-free loans?” ranked first and second, respectively. In contrast, the indicators “in case of needing a loan, how possible is it for you to secure a guarantor?” and “to what extent can you ensure your family members?” ranked seventh and last in terms of importance and priority (Table 3).

3. Inferential Analysis of the Findings on the Capital Models Affecting Sustainable Livelihoods of Rural People in Kermanshah Province

In this section of the research, the degree of alignment and consistency between the conceptual models of sustainable rural livelihoods in Kermanshah Province, derived from

Table 2. Ranking of Social Capital Constructs of the Study Participants

Social Capital	Item	Mean	Standard Deviation	Coefficient of Variation	Rank
Social Trust	If I have the financial capacity, I lend money to others.	3.55	0.951	0.268	1
	I trust the members of the village council and the village mayor.	3.33	0.950	0.285	2
	I lend my work tools to others.	3.34	1.102	0.329	3
	In my opinion, most people are trustworthy.	2.67	0.937	0.351	4
Social Network	How much of your daily time do you spend with friends and neighbors?	3.05	0.800	0.262	1
	If you have a financial problem, how much can you rely on your family and friends?	2.89	0.784	0.271	2
	How much can you rely on your neighbors and friends for assistance in your activities?	2.87	0.807	0.281	3
	How much and for how long have you been a member of local social groups and cooperatives	2.81	0.939	0.334	4
Social Cohesion	How much do the villagers visit each other and inquire about each other's well-being?	3.12	0.692	0.222	1
	To what extent do the villagers help each other in times of difficulty?	2.92	0.737	0.252	2
	To what extent do villagers consult each other on Important matters?	2.46	0.777	0.316	3
	To what extent are there clan-based conflicts and divisions in the village?	2.11	0.885	0.419	4
Social Norms	How much respect is shown to elders in the village?	3.44	0.712	0.207	1
	How much respect is shown to local customs (such as local traditions) among villagers?	3.25	0.747	0.299	2
	How much respect is shown to the existing laws in the village (such as cleanliness and no disturbances)?	3.22	0.764	0.237	3
	How committed are villagers to the customary system in your village?	2.83	0.747	0.263	4
Social Participation	How much do you participate in mourning ceremonies, religious gatherings, and festive celebrations?	3.31	0.808	0.244	1
	How much do you participate in providing financial or labor support for projects implemented in the village?	2.74	0.670	0.244	2
	How much do you participate in collective activities such as cleaning canals and irrigation systems?	2.76	0.722	0.279	3
	How much do you participate in charitable organizations, such as helping to build schools, mosques, etc.?	2.47	0.819	0.331	4
Social Awareness	How aware are you of religious, social, and charitable activities in the village?	3.08	0.776	0.252	1
	How much do you use mass media (tv, radio,etc)?	3.09	0.874	0.282	2
	How aware are you of the duties of government and non-governmental organizations related to their activities?	2.97	0.838	0.282	3
	How much do you follow news related to domestic and international affairs?	2.98	0.846	0.283	4
	How much do you need newspapers, magazines and non-academic books?	2.41	0.803	0.333	5

Table 3. Ranking of livelihood assets indicators among the study participants in Kermanshah

Dimension	Item	Mean	Standard Deviation	Coefficient of Variation	Rank
Human Capital	Skill level in performing agricultural tasks	3.25	0.687	0.211	1
	Ability to cover household health and medical expenses	2.98	0.692	0.232	2
	Attention to hygienic disposal of waste and animal manure in the village	3.07	0.759	0.247	3
	Access to hospitals, clinics and health centers	3.20	0.797	0.249	4
	Ability to transfer skills to others such as children, friends or acquaintances	3.10	0.802	0.258	5
	Ability to diversify household nutrition programs	2.82	0.820	0.291	6
	willingness to produce new products on the farm	2.86	0.871	0.304	7
	Ability to attend educational sessions held in the village	2.89	0.888	0.307	8
	Willingness to implement new methods in agriculture and horticulture	2.81	0.925	0.329	9
	Possession of having technical skills, other than agricultural work	2.64	0.876	0.332	10
	Ability to start a new business	2.34	0.790	0.337	11
	Creativity in making various items	2.59	0.912	0.352	12
	Interest and willingness to engage in entrepreneurship	2.52	0.958	0.380	13
Natural Capital	Assessment of the quantity and quality of village drinking water	2.94	0.737	0.251	1
	Assessment of the fertility of agricultural and horticultural lands	2.81	0.726	0.258	2
	Diversity of plant species in the village environment	2.99	0.787	0.263	3
	Use of chemical fertilizers in agricultural and horticultural lands	2.85	0.757	0.265	4
	Access to ground water resources and wells	2.079	0.749	0.268	5
	Adherence to crop rotation by farmers	2.94	0.798	0.271	6
	Access to pastures for grazing livestock and providing fodder	2.78	0.763	0.274	7
	Access to river water and springs	2.34	0.818	0.349	8
Physical Capital	Adequate access to communication tools like telephones and mobile in the village	4.04	0.700	0.173	1
	Access to veterinary services when needed	3.20	0.871	0.272	2
	Access to roads and pathways suitable for the villager's movement	3.62	1.003	0.277	3
	Adequate access to markets for selling agricultural products	3.11	0.929	0.298	4
	Adequate access to industrial and agricultural tools and machinery	3.32	1.003	0.302	5
	Use of appropriate and durable materials in residential buildings	3.43	1.051	0.306	6
	Adequate access to the Internet in the village	3.29	1.033	0.314	7
	Availability of sufficient facilities and equipment at home	3.22	1.048	0.325	8
	Adequate access to agricultural machinery repair shops in the village	2.45	1.012	0.413	9
Financial Capital	Access to bank loans and credits	4.04	0.700	0.173	1
	Possibility of receiving family or local interest-free loans	3.20	0.871	0.272	2
	Ability to repay received loans	3.62	1.003	0.277	3
	Investment in assets (including buying and selling real state, land, and bank deposits)	3.11	0.929	0.298	4
	last year's income in meeting household needs	3.32	1.003	0.302	5
	Possibility of insuring agricultural products	3.43	1.051	0.306	6
	Ability to provide a guarantor when needed for a loan	3.29	1.033	0.314	7
	Ability to insure family members?	3.22	1.048	0.325	8

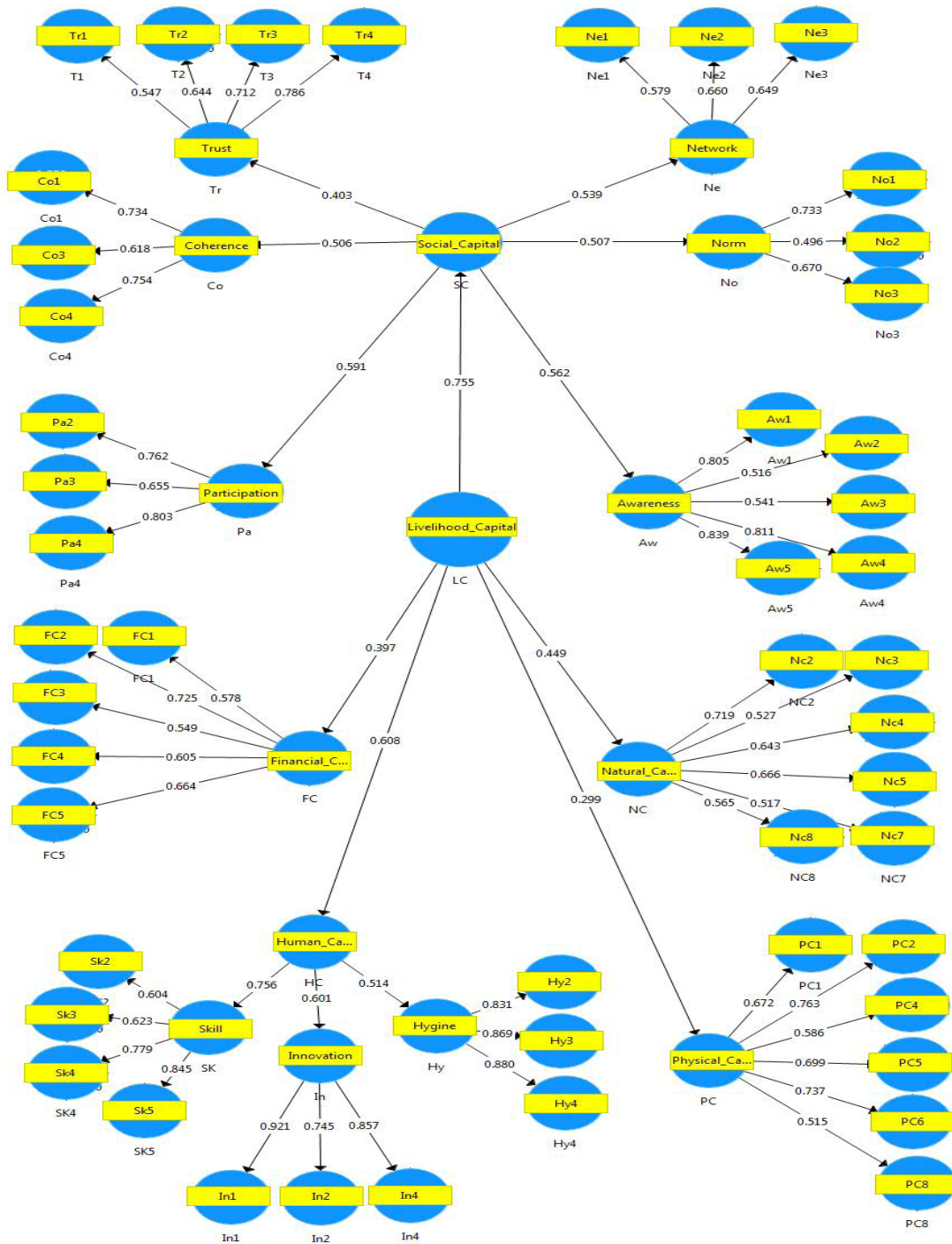


Figure 1. Initial Measurement Model of Livelihood Assets in the Standard Coefficient Estimation (PLS-A) State

the theoretical background section, and its empirical model is examined. In other words, the aim of this section is to test the alignment and conformity between the theoretical constructs and the empirical constructs of the study through the observed data. Specifically, this part of the research seeks to answer the question: Do the measured constructs align with those presented in the conceptual model, or not? To achieve this, the theoretical models of the research were evaluated using Smart PLS software.

3-1. Evaluation of the Quality of the Measurement Model of Sustainable Livelihoods in Kermanshah

In this section, the accuracy of the indicators or measures

selected for each construct is examined to determine whether these indicators are sufficiently precise for measuring their respective construct or not. Once the accuracy of the indicators in measuring their construct is determined, it is necessary to assess whether the constructs, which are measured through observable variables, are influenced by another latent variable at a higher level or not?

If the absolute value of the factor loadings for the observable indicators corresponding to their construct is greater than 0.7, it can be stated that the measurement model is homogeneous and its reliability is confirmed (Davari & Rezazadeh, 2015). Therefore, if the factor loading of an indicator is less than 0.7 but the number of

Table 4. Reliability and Validity of the Model for Measuring the Assets Affecting Sustainable Rural Livelihoods in Kermanshah Province

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Social Trust	0.947	0.939	0.758
Social Network	0.941	0.916	0.745
Social Cohesion	0.908	0.958	0.674
Social Norms	0.954	0.975	0.706
Social Participation	0.877	0.942	0.713
Social Awareness	0.835	0.887	0.675
Skills	0.952	0.925	0.712
Innovation	0.899	0.920	0.862
Nutrition and Health	0.921	0.944	0.748
Financial Capital	0.867	0.923	0.754
Social Capital	0.889	0.923	0.775
Human Capital	0.911	0.971	0.698
Natural Capital	0.947	0.944	0.737
Physical Capital	0.933	0.935	0.659

Table 5. Validity Testing of the Model for Measuring the Assets Affecting Sustainable Rural Livelihoods Based on the Fornell-Larcker Approach

Construct	Fornell-Larcker					HTMT				
	1	--	3	4	5	1	2	3	4	5
Financial Capital (1)	0.814	--	--	--	--	0.791	--	--	--	--
Social Capital (2)	0.603	0.769	--	--	--	0.315	0.310	--	--	--
Human Capital (3)	0.267	0.294	0.758	--	--	0.422	0.294	--	--	--
Natural Capital (4)	0.233	0.362	0.566	0.785	--	0.539	0.552	0.796	--	--
Physical Capital (5)	0.607	0.455	0.624	0.601	0.878	0.827	0.669	0.826	0.649	--

observable variables for the construct is limited (i.e., two or three variables), and the convergent validity (AVE) of the construct is greater than 0.5, the indicator in question can still be retained in the model.

As shown in the software output in Figure 1, all the indicators have appropriate factor loadings on their corresponding latent constructs. Additionally, based on the t-statistic values, these factor loadings are significant at the 0.001 level. Therefore, it can be concluded that the indicators related to each construct possess the necessary reliability and are sufficiently precise to measure their respective constructs.

3-2. Validity and Reliability of the Measurement Model for Sustainable Rural Livelihood Factors in Kermanshah Province

Considering the values of composite reliability, Cronbach's alpha, and the average variance extracted (AVE), which are all above 0.5 for all constructs, it can be concluded that the reliability of the measurement model for the sustainable livelihood assets of the rural households under study is acceptable (Table, 4).

3-3. Diagnostic Validity

To assess diagnostic validity, the Fornell-Larcker criterion and HTMT (Heterotrait-Monotrait Ratio) were used. As shown in Table 5, based on the Fornell-Larcker criterion, the selected indicators for measuring the constructs possess the necessary diagnostic validity. This is because the

diagonal values of the matrix (representing the square root of the AVE for each construct) are higher than all other correlations with the other constructs. Additionally, in the diagnostic validity examination using the HTMT approach, the values are also less than 0.90, which supports the results of the Fornell-Larcker criterion.

Results

The livelihoods of rural residents should be within a sustainable rural habitat, meaning they should be able to withstand environmental crises without depleting or damaging their livelihood assets. This dynamic interaction leads to the improvement of livelihood assets and the development of sustainable livelihood strategies. In this context, the results of the research on the quality of the measurement model and the model fit based on various indicators revealed that the constructs and indicators selected for this model are suitable for application to the rural residents studied. As observed, the conceptual model of the study was analyzed and reviewed through the collection of field data from rural residents in Kermanshah province. Then, based on quantitative analysis, the data were examined and confirmed using the Partial Least Squares (PLS) method. The findings of this research regarding the role of effective capital in the sustainability of rural livelihoods are supported by the results of other studies, such as those by Barimani and colleagues (2016), Sojasi Qidari and colleagues (2016), Savari and colleagues

(2019), and Montazeri and colleagues (2021).

Based on this, the sustainable livelihood approach can be understood through raising awareness of unsustainable living patterns. In this context, the present study provides insights into the nature of the livelihoods of the rural residents under study, leading to decision-making and planning aimed at improving their livelihood sustainability. According to the findings, the people had little trust in the village administration, the village council, or other villagers. It seemed that one of the reasons for the low level of social capital among the rural households under study was this lack of trust. This finding aligns with the results of studies by Badko and colleagues (2020), Heidari Sarban and Abdpour (2018) Barimani and colleagues (2016), and Sojasi Qidari (2016). In general, over 55% of the rural households under study had medium or weak financial capital. It appears that this is also one of the reasons for the decrease in social capital among the studied rural households: their low financial capital. In fact, the lack of financial resources and capital is one of the major obstacles to progress in developing countries such as Iran, and the results of this study confirm this. Similar findings were reported by Heidari Sarban and Abdpour (2018) and Darban astane and colleagues (2018). However, the study by Akbarian and Ramezanzadeh (2019) did not confirm this result.

The results also indicate that the majority of the rural households under study (43.4%) have average human capital, while 43.6% possess good to excellent human capital. This finding is consistent with the study by Imani and Mohamadi Mashkool (2019). Furthermore, the majority of the rural households under study (50.6%) have well to excellent natural capital. In this regard, the findings of the study by Badko and colleagues (2020) support this result. However, it does not align with the research by Heidari Sarban and Abdpour (2018). The findings also showed that the majority of the rural households under study (41.3%) have good physical capital. This result confirms the findings of the study by Saeidi Rad and colleagues (2020), but it does not align with the research by Tavakoli and colleagues (2016).

The findings from the ranking of the dimensions related to "livelihood capital" indicated that the dimensions of "social capital" and "financial capital" were ranked first and last, respectively. This is in line with the results of studies by Badko et al. (2020), Heidari Sarban and Abdpour (2018), Imani and Mohamadi Mashkool (2019), and Barimani et al. (2016). However, in terms of financial capital, the condition of rural households does not appear to be favorable. In this regard, Sharifi et al. (2017) and Darban astane et al. (2018) also found in their research that financial capital is the most unstable dimension of sustainable livelihood. This finding does not align with the study by Mohammadimehr et al. (2022). Overall, the results showed that the majority of the rural households under study (37.7%) have good livelihood capital. Therefore, rural households are in a favorable condition in terms of livelihood capital, such as physical, natural, human, financial, and social capital. This finding is consistent with the study by Karamidehkordi and

Rahimi (2020), but does not align with the findings of Shah et al. (2013), Badko et al. (2020), Ahmadi et al. (2019), and Ghadiri Masoum et al. (2014).

Based on the findings of this research, the following suggestions are provided to improve and enhance the livelihoods of the rural households under study: Financial Capital Diversification: Since the rural households under study are in a weak economic condition regarding financial capital, one of the essential strategies is to diversify their economic activities. Livelihoods are sustainable when rural people are able to withstand economic, environmental, and social challenges. Improving Social Capital: It is suggested that relevant organizations, such as the Agricultural Jihad, enhance their communication with leading and active farmers to increase interaction among them. This, in turn, will strengthen social cohesion, raise awareness, and promote trust-building and technical knowledge. Improving Physical Capital: Increasing physical capital requires that rural households have access to physical infrastructure, such as proper road connections and warehouses for storing their products. Therefore, it is recommended that relevant organizations pay proper attention to this issue. Human Capital Enhancement: Given the importance of livelihood capital and the fact that human capital is at an average level, it is recommended that educational programs be provided for rural people in various fields and be prioritized by rural development planners and stakeholders. Through this approach, the livelihoods of rural households can be improved, leading to sustainability in all aspects of their lives.

Authors contributions

All the authors have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

Conflict of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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