ACCEPTED ARTICLE:

Designing a Model of Sustainable Human Resource Development in Agricultural Extension and Education Organizations of Iran

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Abstract

Sustainable Human Resources Development (SHRD) plays an important role in achieving organizational and individual goals in businesses. Considering that the agricultural extension sector is a vital factor in the development of the agricultural sector, it needs to use the appropriate model of SHRD. The aim of the research was to design a model that can be effective in the development of sustainable human resources in agricultural extension. In this sense, the research is divided into two parts: Grounded Theory (GT) and Structural Equation Modelling (SEM). In the qualitative part, semi structured and face-to-face interview and focus groups were held as part of GT, to create a conceptual model that reflects experts' perception of the effective factor on SHRD using MAXQDA software. In the second part, this model was tested for statistical significance and path correlations through the SEM method by using Smart PLS$_3$ software. SHRD emerged as the axial phenomenon or core category. Legality and organizational commitment offered as the first priority of causal conditions affecting SHRD. Economic context offered a contextual condition. Other important categories linked to the core category was knowledge management and learning. Finally, strategies and consequences of SHRD determined. The SEM analysis showed that causal conditions (β=0.658), contextual conditions (β=0.711) and intervening factors (β=0.690) have a positive and significant effect on the SHRD. Also, based on the results, it can be concluded that contextual conditions (β=0.658) and intervening factors (β=0.701) have a positive and significant effect on SHRD strategies. Based on the results, it can be stated that 61% of the changes in the SHRD are explained by the independent variables of causal conditions, contextual conditions and intervening factors. The most important effect of this research is to provide a model that pays attention to the influencing factors in that model, conditions will be provided for the development of sustainable human resources in the agricultural extension sector.
Keywords: Grounded Theory, Causal analysis, SHRD, Human Development, Iran

Introduction

In various researches, the importance and vital role of human resource empowerment and training in the development of various businesses such as agricultural development has been mentioned (Hanaysha, 2016; Poursaeed & Akbaripour, 2018; Asimeh et al., 2019; Iqbal et al., 2020; Suminah et al., 2023). Agricultural extension as an important factor in making appropriate changes in the agricultural sector must have a specific and scientific model for the development of the agricultural sector (Danso-Abbeam et al., 2018). The basic emphasis in this model should be based on the Sustainable Human Resources Development (SHRD). One of

the basic problems in the agricultural extension sector is the low attention to a systematic program in the SHRD (Yazdanpanah & Rahimifayzabad, 2019). Lack of continuous training of extension experts (Antwi-Agyei and Stringer, 2021), lack of in-service training of agricultural extension experts (Ajieh and Ulakpa, 2018) and low attention to educational needs (Nazarzadehzareh et al., 2011) are among the most important problems that prevent attention to the development of human resources in the extension sector.

Agricultural extension and consulting activities is an educational service based on development and human interaction that seeks to improve the livelihood of farmers and villagers by providing up-to-date knowledge, research results and information and technology. Training of extension workers increases the effectiveness of extension activities. It will improve the SHRD in the villages (Lopokoiyit et al., 2012). Mengal and Habib (2016) concluded the HRD is vital subject to agricultural extension and education advisory services in order to development of the perceptions and paradigms. A skilled and trained expert is commonly acknowledged as one of the greatest and essential asset for any organizations. There is an information gap between extension offices and agricultural universities, which should be strengthened by the operational efforts of HRD and holistic approaches to this relationship. Lalitha and Babu (2019) expressed the holistic approach to agricultural extension activities goes beyond technology transfer and economic profitability for agricultural production systems. Today, agricultural extension activities emphasize goals based on the HRD and take into account the mechanisms of management and technical skills in the farm and outside the farm until the supply of the product to the customer.

The purpose of HRD is to help employees to develop their knowledge, skills and abilities for personal development and organizational effectiveness. HRD is created through opportunities such as formal and informal and in-service training of employees, capacity building and career development, mentoring, coaching, and professional development (Montague et al., 2016). According to many researchers, one of the most critical challenges in the agricultural sector is the development and effective management of human capital, attracting, motivating and maintaining human potential (Nótári et al., 2013; Berber and Slavić, 2020). The issue of HRD in the agricultural sector is unknown in terms of scientific research and practical implementation, and there is a need for scientific and regional research in this sector (Awadalla, 2022). Paying attention to HRD in the organization is of high importance because it is one of the most important factors for obtaining a sustainable competitive advantage and long-term success for any organization (Kloutsiniotis & Mihail, 2020; Berber and Slavić, 2020). Development and management of human resources as a process of effective and efficient management of human capital in an organization including several interconnected activities such as human resource planning, recruitment and selection, socialization, training and education, performance evaluation, rewards and benefits, employee relations, health and safety, etc (Nótári et al., 2013). The sustainability of human resource development is the basis for the future improvement and success of an organization (Mohiuddin et al., 2022). The most important research problem is that human resource development in extension organizations is not desirably dynamic and progressive. A review of several research studies has revealed that standing on traditional systems have decreased mobility, motivation, and effective recruitment among extension personnel (Karbasioun and Mulder, 2004; Lopokoiyit et al., 2012). Considering that such a research has not been done so far regarding the development of human resources in the agricultural extension sector of Iran, it has a high novelty. The purpose of this research was to develop a model of sustainable human resource development in agricultural extension and education organizations of Iran and validate this model.

Methodology

This research is a non-experimental research. In order to achieve the research objectives in this research, two qualitative and quantitative paradigms were used. The purpose of the research is to design a model that can be effective in the development of sustainable human resources in agricultural extension. According to the majority of experts, the issue of sustainable development is a multifaceted and complex issue, in such a way that there is no consensus about its dimensions and elements in the opinions of researchers in this field. In order to better understand multifaceted issues such as the issue of sustainable development, we will need to pay attention to the diversity of concepts from the perspective of competent experts. The realization of this depends on the use of qualitative research paradigm. Therefore, the research plan consists of two parts, qualitative paradigm is used in the first stage and quantitative paradigm is used in the second stage. In the qualitative research paradigm, in-depth interviews with experts and focused groups were used, and in the second stage, in the quantitative research paradigm, the descriptive-analytical research method and the structural equation model were used. Grounded theory method was used to extract concepts, subcategories and categories in the qualitative part. The study sample of this research in the qualitative phase included key informants and experts aware of the development of sustainable human resources in agricultural extension in Tehran province, which included: 8 university professors and 14 managers with at least 5 years of managerial experience in the extension department. The number of interviews was not known in advance, but the interviewing process continued until the theoretical saturation was reached. The analysis steps in the qualitative part included three types of coding:

Open Coding: It is done by understanding the concept of an event and choosing a label for it and by the technique of continuous comparison. In fact, it is an analytical process through which concepts are identified.

Axial Coding: The researcher selects one of the classes as the axial class, explores it under the title of the central phenomenon in the center of the process, and determines the relationship of the other classes with it. The relationship of other classes with the central class can be realized in five headings (Alnsour, 2022):

1- Causal conditions: these conditions cause the formation of the axial phenomenon.
2- Strategies: actions or interactions that arise from the axial phenomenon.
3- Contextual: special conditions that affect strategies, these conditions form a set of concepts, categories or context variables.
4- Intervening factors: are general environmental conditions that affect strategies.
5- Consequences: They represent the results and consequences that arise as a result of the use of strategies.

Selective coding: At this stage, the researcher presents the framework of the paradigm model in a narrative form and shows the final theory graphically (Williams et al., 2022).

The statistical population in the quantitative part included all experts and managers of agricultural extension in Tehran province (210 experts). The number of statistical sample was determined through Cochran's formula (165 experts). In order to validate the presented model, confirmatory factor analysis has been used in the framework of the structural equation model. Smart PLS$_3$ software was used for quantitative statistical analysis.

Results and Discussion
Results
Identifying factors affecting the SHDR

In this research, in order to design a model of SHDR, identifying the factors affecting it through semi structured and face-to-face interview methods and a focus group with a GT approach. For this purpose, the opinions of 22 experts from agricultural extension and education organizations

of Iran were used. For this purpose, Strauss and Corbin coding method was used to achieve specific goals (Strauss & Corbin, 1998).

The study sample of this research in the qualitative stage included key informants and experts knowledgeable about sustainable human resource development, which included: 8 university professors and 14 managers with at least 5 years of managerial experience. The data collection process continued until the theoretical saturation stage. The current research included 22 in-depth interviews with experts and holding a focus group. The duration of the interviews was from 50 to 110 minutes and the focus group time was 120 minutes. A total of 1980 minutes of interviews were conducted. As a result, 429 concepts were expressed, and a total of 94 initial codes were extracted, which had at least 10 repetitions.

Identifying causal conditions affecting the SHDR

Based on the qualitative study conducted in the form of 3 stages of open coding, axial coding and selective coding using MAXQDA12 software. First, the semantic units obtained from the face-to-face interviews and the focus group were entered into the software after writing edits, and then the aforementioned three types of coding were implemented.

Open coding:

In this stage of coding, by performing content analysis and careful study of the statements obtained line by line, the concepts were adjusted. First, the data from the interview was analyzed and the answers were converted into semi-structured questions during the interview. The key issues discussed were extracted in separate sentences. In this way, the results of the semi-structured interview and focus group with experts were identified and extracted in the form of 25 concepts. First, the main sentences under the title of concepts were extracted from direct quotes that had at least 10 repetitions, and each of the codes was indicated by the symbol A. The results of open coding are presented in Table 1.

Table 1. Conceptualization of data obtained from respondents' answers for causal conditions (open coding)

Concepts (Initial Codes)	Code
Participation and interaction with employees	A1
Motivate workers	A2
Continuous and in-service training	A3
Strengthening morale	A4
Identify obstacles and challenges	A5
Identification of risks	A6
Prioritizing challenges and managing them	A7
Prioritizing risks and managing them	A8
Cultivation of performance management	A9
Creating a favorable attitude to performance management	A10
Creating conditions for the development of performance management knowledge	A11
Improving the fields of strengthening the feeling of need for performance management	A12
Coordination of different departments	A13
Create a context for providing work feedback to employees	A14
Availability of necessary facilities for performance management and evaluation	A15

Attention to the mental and psychological conditions of employees	A16
Attention to the physical condition of employees	A17
Paying attention to the competencies and capabilities of employees in performance management	A18
Attention to values in performance development	A19
Attention to ethics in performance improvement	A20
Attention to competitive advantage in performance	A21
Creating the necessary conditions for the stabilization of the performance management system	A22
Attention to productivity in the organization	A23
Paying attention to the law and regulations and directives in performance management	A24
Creating the necessary conditions to improve organizational commitment	A25

Axial coding

In this step, the number of repetitions of concepts was determined and subcategories were extracted. Based on the results of the axial coding of causal conditions, 7 subcategories were expressed in the form of 25 concepts and with 330 repetitions (Table 2).

Table 2. Subcategories extracted from the concepts of causal conditions

Category	Subcategories	Concepts code	Repetitions
Causal conditions	Participation and interaction	A1, A2, A10	16, 18, 12
	Empowerment and professional development	A3, A4, A11, A15, A20	15, 11, 14, 14, 10
	Management of risks and challenges	A5, A6,, A7, A8	13, 12, 16, 12
	Institutionalization of performance management	A9, A12, A19, A22	11, 15, 12, 11
	Legality and organizational commitment	A13, A14, A15, A24, A25	15, 13, 14, 10, 14
	Mental and physical characteristics of employees	A16, A17	12, 12
	Competitive advantage and productivity	A21, A23	13, 15

Selective encoding:

At this stage of the research, the relationship obtained in open coding and the subcategories resulting from axial coding with the main category was determined in the form of a graph based on the index of repetition. Figure 1 shows that, legality and organizational commitment, empowerment and professional development, risk management and challenges, institutionalization of performance management, participation and interaction, competitive advantage and productivity and mental and physical characteristics of employees, based on priority, the most important causal conditions affecting the development of sustainable human resources in agricultural extension and education organizations of Iran.
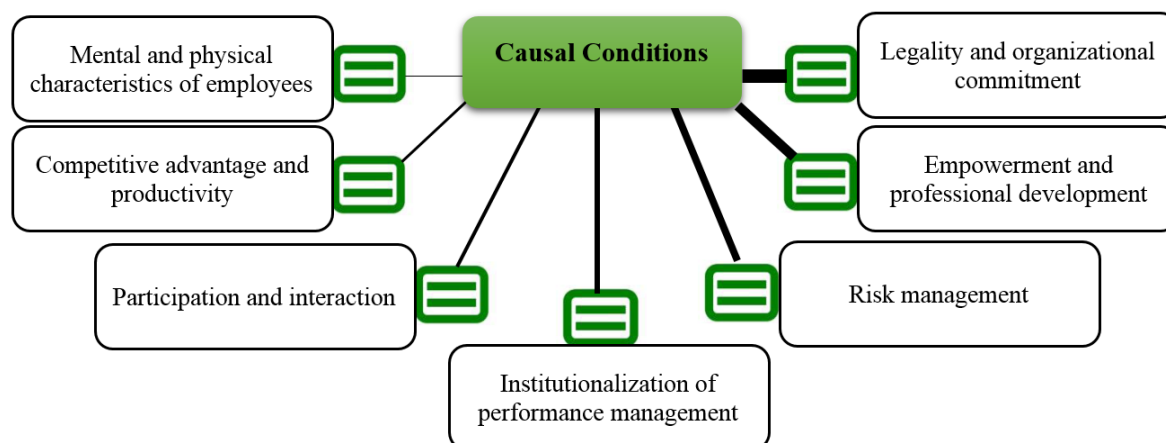
Figure 1. Causal conditions affecting the SHDR

Identifying the contextual conditions affecting the SHRD

Open coding:

The results of the semi-structured interview and focus group with experts were identified and extracted in the form of 16 concepts as contextual conditions. First, the main sentences under the title of concepts were extracted from direct quotes that had at least 10 repetitions, and each of the codes was indicated by a Z symbol. The results of open coding are presented in Table 3.

Table 3. Conceptualization of data obtained from respondents' answers for contextual conditions (open coding)

Concepts (Initial Codes)	Code
Technical infrastructure	Z1
Policies and rules and regulations	Z2
profitability	Z3
Financial transparency	Z4
Economic efficiency	Z5
Educational infrastructure	Z6
Beliefs, values and attitudes governing the organization	Z7
Organizational Culture	Z8
Organizational missions	Z9
Legal infrastructure	Z10
meritocracy	Z11
The existence of platforms for attracting participation	Z12
flexibility	Z13
The existence of communication skill development fields	Z14
Management infrastructure	Z15
The existence of areas for the development of creativity and innovation	Z16

Axial coding

6

In this step, the number of repetitions of concepts was determined and subcategories were extracted. Based on the results of the axial coding of contextual conditions, 5 subcategories were expressed in the form of 16 concepts and with 230 repetitions (Table 4).

Table 4. Subcategories extracted from the concepts of contextual conditions

Category	Subcategories	Concepts code	Repetitions
Contextual conditions	Infrastructure	Z1, Z6, Z10, Z15	13, 16, 11, 15
	Foundations of organizational culture	Z2, Z7, Z8, Z9	12, 14, 13, 14
	Economic conditions	Z3, Z4, Z5	18, 19, 20
	Organizational social platforms	Z11, Z12, Z13	14, 12, 11
	Platforms for creativity, innovation and communication	Z14, Z16	13, 15

Selective coding:
Figure 2 shows that economic conditions, infrastructures, foundations of organizational culture, organizational social platforms, platforms for creativity, innovation and communication are the most important contextual conditions affecting the SHRD.
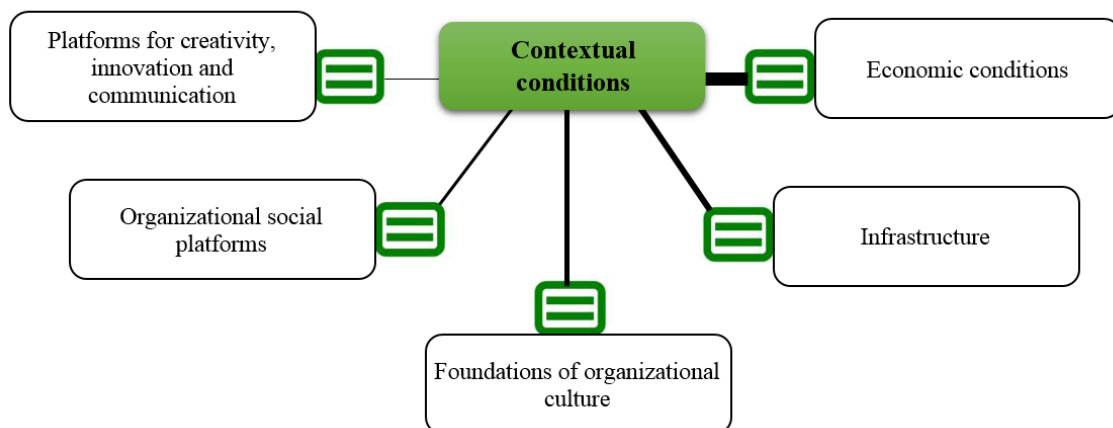

Figure 2. Contextual conditions affecting the SHRD

Identifying the effective intervening factors on the SHRD
Open coding:
The results of the semi-structured interview and the focus group with the experts, in total, the intervening factors were identified and extracted in the form of 17 concepts. First, the main sentences under the heading of concepts were extracted from direct quotes that had at least 10 repetitions, and each of the codes was indicated by an M symbol. The results of open coding are presented in Table 5.
Table 5. Conceptualization of data obtained from respondents' answers for intervening factors (open coding)

Concepts (Initial Codes)	Code
Supporting top managers to implement performance management	M1
Existence of manpower planning system	M2
Existence of control and evaluation system	M3
Development of job capacities	M4
Development of learning opportunities	M5

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Knowledge management in the organization	M6
Expanding the culture of performance management in the organization	M7
Employee motivation	M8
Use of financial incentives	M9
Implementation of performance management research activities in the organization	M10
Training to improve performance in the organization	M11
Policy based on performance management	M12
Managers' appropriate view of performance management	M13
Participation in decision making	M14
Using the ideas of employees	M15
Social demands for performance management	M16
The need to evaluate and monitor performance	M17

Axial coding

Based on the results of central coding, the intervening factors effective on SHRD were expressed in table 6 by 6 sub-categories in the form of 17 brief descriptions and with 251 repetitions with different items.

Table 6. Subcategories extracted from the concepts of intervening factors

Category	Subcategories	Concepts code	Repetitions
Intervening factors	Structural	M1, M2, M3, M14	15, 14, 13, 12
	Knowledge management and learning	M4, M5, M6, M15	12, 19, 16, 18
	Sociocultural	M7, M13, M16	14, 16, 20
	Incentives	M8, M9	11, 15
	Policy	M12	15
	Educational and research	M10, M11, M17	14, 16, 11

Selective encoding:

Figure 3 shows that knowledge management and learning, structural, sociocultural, policy making, educational and research and incentives are the most important intervening factors affecting the SHRD.
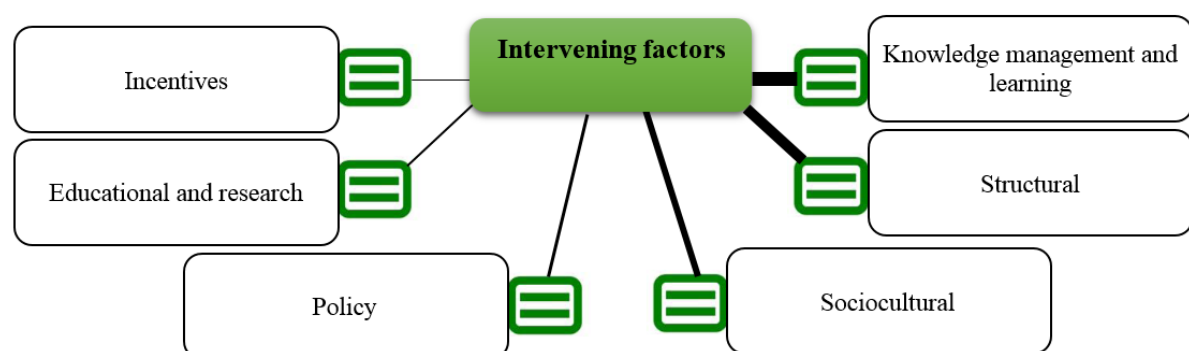

Figure 3. Intervening factors affecting the SHRD

Identifying effective strategies on the SHRD

Open coding:

The results of the semi-structured interview and focus group with experts were identified and extracted in the form of 17 concepts. First, the main sentences under the title of concepts were extracted from direct quotes that had at least 10 repetitions and each of the codes was indicated by an S symbol. The results of open coding are presented in Table 7.

Table 7. Conceptualization of data obtained from respondents' answers for strategies (open coding)

Concepts (Initial Codes)	Code
Group and collective decision making	S1
Respecting the opinions of specialized teams	S2
Needs assessment for training	S3
Strengthening the sense of organizational belonging	S4
Team building for performance management	S5
Training to increase self-confidence	S6
Need-based training in performance management	S7
Explaining the goals and expectations of the organization	S8
Updating performance indicators	S9
Clarification of indicators	S10
Up-to-date and timely training in functional areas	S11
Monitoring and evaluation according to job dimensions and fields	S12
Development of knowledge and attitude in the field of performance management	S13
Skill development and application of performance management	S14
Develop monitoring, evaluation and feedback appropriate job descriptions	S15
Development of communication skills	S16
Developing creativity and innovation to improve performance	S17

Axial coding

In this step, the number of repetitions of concepts was determined and subcategories were extracted. Based on the results of axial coding, effective strategies on development of sustainable human resources were expressed in table 8 in 5 sub-categories in the form of 17 concepts and with 254 repetitions.

Table 8. Subcategories extracted from the concepts of strategies

Category	Subcategories	Concepts code	Repetitions
Strategies	Collaborative and communication strategies	S1,S2, S5, S16	16, 17, 12, 14
	Educational strategies	S3, S6, S7, S11	21, 14, 20, 12
	Targeting strategies	S8, S9, S10	13, 15, 14
	Supervisory strategies	S12, S15	14, 12
	Cognitive and emotional strategies	S4, S13, S14, S17	16, 15, 11, 18

Selective encoding:

Figure 4 shows that educational strategies, cognitive and emotional strategies, collaborative and communication strategies, targeting strategies and supervisory strategies are the most important effective strategies on SHRD.
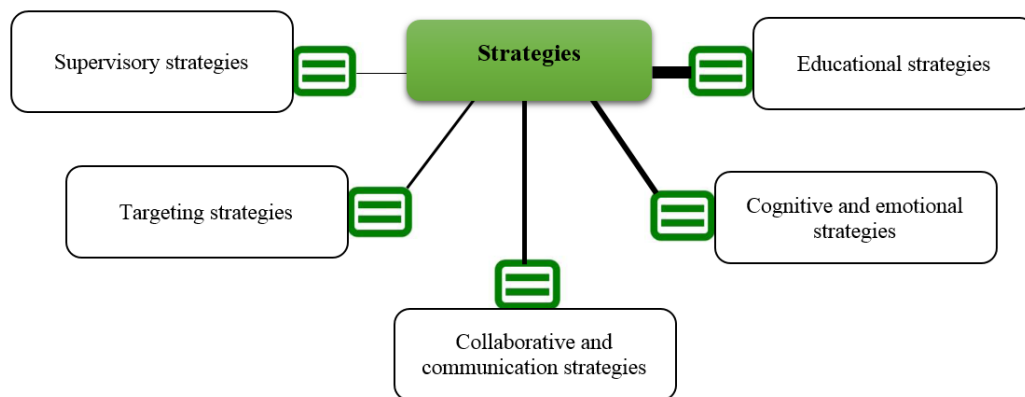
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Figure 3. Strategies affecting the SHRD

Identifying the consequences of SHRD

Open coding:

The results of the semi-structured interview and focus group with experts were identified and extracted in the form of 19 concepts. First, the main sentences under the title of concepts were extracted from direct quotes that had at least 10 repetitions, and each of the codes was indicated by a P symbol. The results of open coding are presented in Table 9.

Table 9. Conceptualization of data obtained from respondents' answers for consequences (open coding)

Concepts (initial codes)	Code
Increasing participation in the organization	P1
Strengthening social capital	P2
Reducing conflict and stress in the role	P3
Stress management	P4
Creating creativity and innovation	P5
Increase effectiveness	P6
More commitment and self-control	P7
Job satisfaction	P8
Create motivation	P9
Increase productivity	P10
Increase interaction in the organization	P11
Coherence and empathy	P12
Resources management	P13
Achieving organizational goals	P14
A sense of responsibility in doing things	P15
Increasing responsiveness to stakeholders and the general public	P16
Honoring clients in the organization	P17
Identifying obstacles and challenges to achieving goals	P18
Crisis management	P19

Axial coding

10

Based on the results of axial coding, the consequences of SHRD in table 10 were expressed in 5 sub-categories in the form of 22 concepts and with 291 repetitions.

Table 10. Subcategories extracted from the concepts of consequences

Category	Subcategories	Concepts code	Repetitions
Consequences	Organizational consequences	P1, P5, P14, P18	12, 18, 18, 19
	Social consequences	P2, P11, P16, P17	16, 14, 15, 18
	Economic consequences	P6, P10	19, 16
	Individual consequences	P3, P6, P7, P8, P12, P15	14, 15, 11, 12, 12, 13
	Managerial consequences	P4, P13, P19	18, 15, 16

Selective encoding:
Figure 4 shows that individual, organizational, social, managerial and economic consequences are the most important consequences of SHRD.
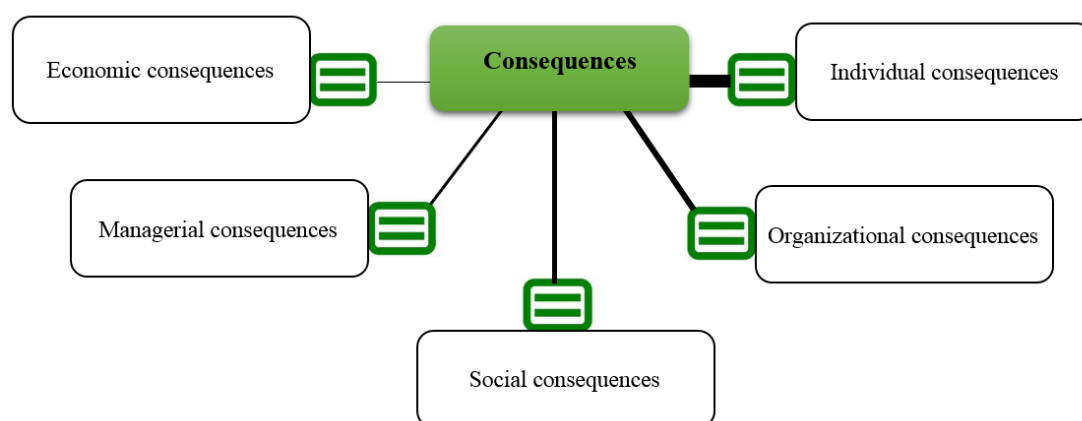

Figure 4. Consequences of SHRD

Research model test (SHRD model in agricultural extension and education organizations of Iran)
To test the research model and hypotheses, the SEM was used using Smart PLS$_3$ software. The fit of the structural model was also evaluated using R^2, Q^2 and GOF criteria. According to the results of Table 11, the fit criteria had acceptable amount.

Table 11. R^2, Q^2 and GOF amount for fitting the outcomes model

Construct	R^2	Q^2	GOF
SHRD	0.737	0.609	0.661

Next, the research hypotheses were tested. The way to decide to reject or confirm the hypotheses is to compare the t-value with the numbers +1.96 and -1.96. If the calculated values are between these two values, the desired hypothesis is rejected, and if it is not, the hypothesis is confirmed. The results of the hypothesis test are presented in Table 12 and the final research model is presented in Figures 5 and 6.

Table 12. The results of the research hypotheses test

Hypotheses	Independent	Dependent	Path coefficient	t-value	R^2	Test results
H1	Causal conditions	SHRD	0.658	8.598	0.452	Confirm
H2	Contextual conditions	SHRD	0.711	9.759	0.598	Confirm
H3	Intervening factors	SHRD	0.690	11.651	0.521	Confirm
H4	Contextual conditions	Strategies	0.658	6.598	0.643	Confirm
H5	Intervening factors	Strategies	0.701	7.892	0.561	Confirm
H6	Strategies	Consequences	0.815	8.981	0.612	Confirm

The results of Table 12 showed that causal conditions (β=0.658), contextual conditions (β=0.711) and intervening factors (β=0.690) had a positive and significant effect on SHRD. Also, based on the results of Table 12, it can be concluded that contextual conditions (β=0.658) and intervening factors (β=0.701) had a positive and significant effect on SHRD strategies.
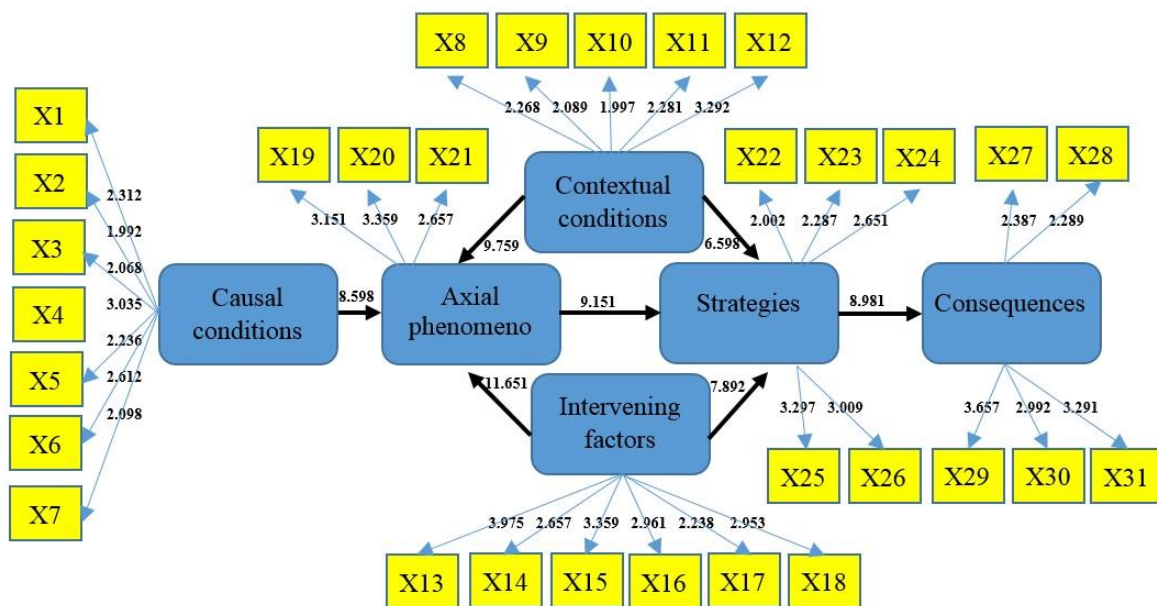

Figure 5. t-values for relationships between factors and variables of SHRD causal model
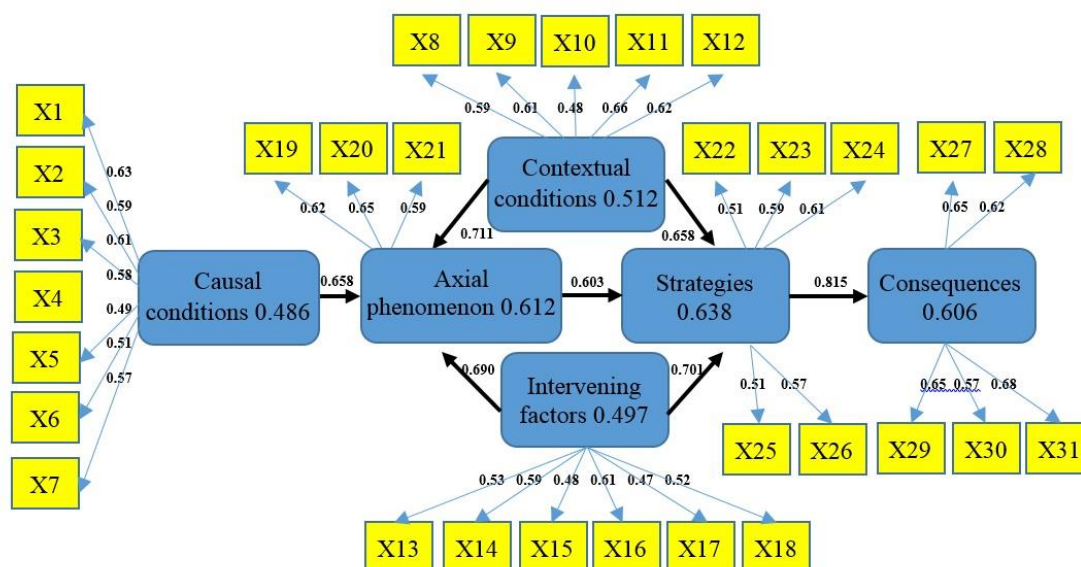
Figure 6. The values of the standardized loadings for each of the factors and variables of the SHRD causal model

Based on the results of Figure 6, which is the output of Smart Pls3 software, it can be stated that 61% of SHRD changes are explained by the independent variables of causal conditions, contextual conditions and intervening factors. Also, 63% of changes in strategies are affected by the axial phenomenon, contextual conditions and intervening factors, and finally 60% of changes in consequences are caused by the use of identified strategies.

Discussion

Legality and organizational commitment were identified as the first priority of causal conditions affecting SHRD, which were emphasized in the researches of Khoshdel et al., (2020) and Eyvazi et al., (2021). Empowerment and professional development was identified as the second priority of the causal conditions affecting SHRD, which was identified in the researches of Ranji Jafroudi and Rezaei (2020) and Shirtaheriet al., (2020), reached this conclusion. Risk management was identified as the third priority of the causal conditions affecting SHRD, which were also identified in the researches of Arefmanesh et al., (2022). The institutionalization of performance management was identified as the fourth priority of causal conditions affecting SHRD, which was also emphasized in the researches of Hollandsworth (2021), Hasbolah et al., (2018), Yetano (2013). Participation and interaction were identified as the fifth priority of causal conditions affecting SHRD, which were emphasized in the researches of Butali and Njoroge (2018), Jimoh (2018), Alizadeh et al., (2022). By examining the sources and results of various studies, it was found that in studies such as Fechete and Anisor (2019), Bethany (2021), Liu et al., (2021) and Trébucq and Magnaghi (2017) on economic factors such as productivity, efficiency, profitability and effectiveness are emphasized on SHRD. These results are in line with our research. In the results of the researches of Karaka (2022) and Outila and Fey (2021), concluded the existence of various technological, cognitive and physical infrastructures has been considered effective in contextual conditions that is in line with our research. Organizational social platforms were identified as the another priority of the contextual conditions effective on SHRD. The results obtained from the research of Ommani (2011) confirm the obtained result. Based on the results

of this section, knowledge management and learning was identified as the first priority of the intervening factor affecting the SHRD. The research results of Lopes et al., (2017) and Rasool et al., (2019) are in line with the obtained results. Structural factors such as the existence of a control and evaluation system, the support of top managers for the implementation of performance management, the existence of a manpower planning system and participation in decision-making were identified as the second priority of intervening factors affecting the SHRD. The result of Felício et al., (2021) is in line with the result of this research. Based on the results, educational strategies were identified as the first priority of effective strategies on SHRD. By examining the results of various researches, it was found that the result of Ommani (2011) is in line with the results obtained in this research. By examining the results of different studies, it was found that the results of Karaka (2022), Kartadjumena and Rodgers (2019) such as effective role of cognitive and emotional strategies on SHRD, are consistent with the results obtained in this study. Collaborative and communication strategies were identified as the third priority of effective strategies on SHRD. By examining the results of various researches, it was found that the results of Manville and Greatbanks (2020), Outila and Fey (2021) are in line with the results obtained in this research.

Conclusion

Legality and organizational commitment were identified as the first priority of causal conditions affecting SHRD. Therefore, providing conditions for improving organizational commitment and developing laws in line with the development of sustainable human resources plays an effective role in SHRD. Empowerment and professional development was identified as the second priority of the causal conditions affecting SHRD. It is very important to provide the necessary conditions for empowerment through holding In-service training courses and meeting educational needs in specialized subjects. Professional development is necessary to increase productivity. Risk management was identified as the third priority of the causal conditions affecting SHRD. Risk management was identified as the third priority of causal conditions affecting SHRD. Therefore, risks can be managed by identifying, evaluating and prioritizing possible risks, followed by the coordinated and optimal use of resources, to minimize the possibility of the impact of unfortunate events or to maximize the possibility of realizing opportunities. Risk exists where there is opportunity for profit and loss. The institutionalization of performance management was identified as the fourth priority of causal conditions affecting SHRD. For institutionalization, it is possible to show performance management as a necessity in the organization through educational and cultural programs and turn it into a social reality. Also, participation and interaction were identified as the fifth priority of causal conditions affecting SHRD. The use of the comments of the subgroup and their participation in making the organization's decisions will contribute to the achievement of the organization's goals in the shortest possible time. It was also found that economic conditions, infrastructures, foundations of organizational culture, organizational social platforms, platforms for creativity, innovation and communication are the most important contextual conditions affecting the SHRD. Based on the results, the economic conditions section was identified as the first priority of the contextual conditions affecting the SHRD. Infrastructures were identified as the second priority of the contextual conditions affecting the SHRD. Foundations of organizational culture was identified as the third priority of the contextual conditions affecting the SHRD. Organizational social platforms were identified as the fourth priority of the contextual conditions effective on SHRD. Based on the research results, it was found that knowledge management and learning, structural, sociocultural, policy making, educational and research and incentives are the most important intervening factors affecting the SHRD. Based on the results of this section, knowledge management and learning was identified as the first priority of the intervening factor affecting the SHRD. Structural factors

such as the existence of a control and evaluation system, the support of top managers for the implementation of performance management, the existence of a manpower planning system and participation in decision-making were identified as the second priority of intervening factors affecting the SHRD. In the following, effective strategies on SHRD were identified. The most important strategies identified were: educational strategies, cognitive and emotional strategies, collaborative and communication strategies, targeting strategies and supervisory strategies. Based on the results of this section, educational strategies were identified as the first priority of effective strategies on SHRD. Cognitive and emotional strategies were identified as the second priority strategies effective on SHRD. Collaborative and communication strategies were identified as the third priority of effective strategies on SHRD. According to the results of qualitative method of grounded theory and quantitative method of structural equation model analysis, SHRD model was designed. It is recommended to all those involved in the agricultural extension sector to consider this model as a practical model to development sustainable human resources in this sector. It should be noted that one of the most important limitations of the research was its implementation during the outbreak of the Corona virus disease 19. Holding meetings with experts and observing health protocols had faced limitations for researchers.

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