

## **Rural Women's Environmental Literacy in Kermanshah Province: An Extension Perspective**

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### **ABSTRACT**

Conservation of environment as one of the main pillars of human life requires the attention and effort of all people, especially women, and the prerequisite for that is the Environmental Literacy (EL). The purpose of this mixed-method research was to assess rural women's EL level, and identify appropriate methods of EL extension among them. Statistical population of the study consisted of 203,504 rural women (15-64 ages), of whom 384 women were selected as sample using modified stratified random sampling technique. In order to gather the information, a questionnaire was developed including components of environmental attitudes, concerns, knowledge, skills, and behavior. Validity of questionnaire was confirmed by a panel of expert, and its reliability was confirmed by Cronbach's alpha (0.86–0.93). In the qualitative section, the study population consisted of experts in agriculture extension, environment and natural resources, as well as rural women. Samples were selected using purposeful sampling and snowball technique. Results of quantitative section showed that the level of EL of rural women was moderate ( $M= 61.427$ ,  $SD= 8.003$ ) and means of environmental knowledge ( $M= 10.292$ ,  $SD= 3.293$ ) and concern ( $M= 11.926$ ,  $SD= 2.328$ ) were lower than other dimensions. MANOVA analysis also revealed that there were significant differences in level of EL of rural women among townships of Kermanshah Province with different degrees of agricultural development. Rural women in more developed regions had higher environmental knowledge and skills, but their environmental behavior was similar to underdeveloped and developing regions. The results of the qualitative section also indicated that EL extension methods of women in the villages of different regions were almost the same, but the women from the developed villages had higher tendency to participatory extension methods. Results from this study could contribute to improvement of environmental program in order to promote EL across the society.

**Keywords:** Environmental behavior Environmental education, Extension methods.

### **INTRODUCTION**

Concerns about the decrease in quality of the environment have been increasing during the last decades. Human activities inflict intense and often irreparable damage on the environment (Cutter and Smith, 2001). Evidence show that Iran also is not safe from these damages and environmental crisis of Iran is one of the severest in the world (Hedjazi and Arabi, 2009). Because of

this, Iran is ranked 132 among 146 countries in Environment Sustainability Index (Papzan and Papzan, 2012). Environment is one of the fundamental and sensitive aspects, especially in rural areas, and protection of rural environment is vital according to the relationship between rural areas and nature (Kazemi, 2016).

In rural areas, agriculture and domestic sectors produce environmental pollutants. Rural areas are under considerable environmental strain, particularly from

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intensification of agriculture due to rapid population growth (Halim, 2001). Agriculture is the first and most obvious way to manipulate environment. In Iran, agriculture is an environmental degradation factor. Land use changes, soil erosion, pollution of water resources, and, in general, the loss of the quality of natural resources are attributed to the livelihood style and mismanagement of the villagers (Pourghasem *et al.*, 2017). Thus, the unsustainable and excessive use of natural resources due to poverty has caused agriculture to inflict the most damage to the rural environment.

Environmental pressure from households will increase (OECD, 2008a), and the household sector affects the environment through waste generation, water and energy use, and food consumption (OECD, 2008b). In addition, rural households have the potential to play an effective role in preservation of natural resources. Today, management of natural resources and preservation of ecological balance are perceived as essential elements of rural development (Dufumier, 1992). In this regard, rural communities should be responsible for protecting their local environment and this responsibility requires the participation of all groups such as farmers, youth, women, and others. Right now, there is a growing awareness of the need and importance of making women contribute to decrease in the environmental problems (Kazemi, 2016).

Women are household manager and among the farm managers in rural areas; moreover, they are responsible for the transfer of behavioral patterns and environmental values across the generations. Therefore, they can play a critical role in protecting the environment. This is while women face constraints such as the lack of control over land and income, and access to education and training. Given that women's empowerment is one of the sustainable development goals, reducing women's problems and increasing their ability to protect natural resources should be

considered seriously. This happens when specific education programs for women are developed, and their knowledge, behavior, and environmental attitudes are increased. Many experts believe that environmental crisis can be overcome by fostering environmental behavior and increasing the environmental knowledge and attitude (Raeisi *et al.*, 2018). These components constitute the concept of EL. Enhancing the EL level of women leads to raising awareness and knowledge of families and community (Fathi Vajargah and Farmihani Farahani, 2004).

In Iran, the general principle of environmental protection emphasizes public environmental education, therefore, extensive and comprehensive activities in order to increase environmental awareness of the community is essential. Nevertheless, rural women are not considered in the informal training (Rahimi, 2003) and low investment has been made in women's education (Berger *et al.*, 1984; Malek Mohammadi and Hosseini Nia, 2000; Emadi, 2001). Training courses designed for rural women have not been associated with environmental issues (Interview with experts of Jihad-e-Keshavarzi 2015), therefore, many women are unaware of the basic environmental principles (Hatami Nezhad and Jahedi, 2009). Accordingly, the purpose of this study was to assess EL of rural women in Kermanshah Province and prioritize education methods of EL promotion, for use by planners to develop programs to promote the EL among rural women.

### **Environmental Education (EE) and Environmental Literacy (EL)**

EE is the most powerful mechanism to address the environmental crisis (Orr, 1992). EE have their roots in the educational movements related to nature, and outdoor education (Hollweg *et al.*, 2011). In fact, EE is referred to 'education for sustainable development', 'education for a sustainable

future' and 'education for sustainability' (Cutter and Smith, 2001). EE is defined as preparing active and committed citizenry that is knowledgeable concerning the environmental problems, aware of how to help in solving the problems, and motivated to work toward their solution (Stapp *et al.*, 1969). Therefore, developing EL is the major outcome of EE (Srbinovski *et al.*, 2010).

The term EL was first used by Roth in 1968 (McBride *et al.*, 2013), and emerged out of growing international concern about the health of the earth. Many experts began to see a need for a citizenry that understand how human interactions with the nature affect the world (Thorpe, 2004). Therefore, EL surrounds an understanding of how people, societies, and natural systems relate to each other (Orr, 1992). Roth (1992) defined EL as essential capacity to perceive of the environmental systems, and take appropriate action to improve the health of those systems.

EL is a broad spectrum, from complete unawareness to deep understanding and awareness (Swanepoel *et al.*, 2002). Ozsoy *et al.* (2012) considers four components of EL including environmental knowledge, attitudes, uses, and concerns. Other frameworks are knowledge, skill, affective, and behavioral components (Hungerford and Volk, 1990); ecological knowledge, environmental affect, cognitive skills, and behavior (McBeth *et al.*, 2008); knowledge, attitude, sensitivity, and concern (Veisi *et al.*, 2019). In this study, the dimensions of attitudes, concern, skill, knowledge, and behavior were considered as criteria in the analysis of the status of EL in the rural women of Kermanshah province.

Many researchers have studied EL or its dimensions. In the last decade, there has been an increase in the use of EE programs in schools. Therefore, most of EL assessment focused on students (Kibert, 2000; Harnessa and Drossmana, 2001; Hsu, 2004; Moody *et al.*, 2005; Chua *et al.*, 2007; McBeth and Volk, 2010; McBeth *et al.*, 2008, 2011; Ozsoy *et al.*, 2012; Evans *et al.*,

2013; Salehi and Ghaemi Asl, 2013; Halimatussadiyah *et al.*, 2017; Veisi *et al.*, 2019) and teachers (Said *et al.*, 2003; Pe'er *et al.*, 2007; Joseph *et al.*, 2013; Zamani Moghadam and Saedi, 2013). But, little attention has been paid to villagers and especially rural women (Ziapour *et al.*, 2013; Khaje Shahkouhi *et al.*, 2015; Hosseinneshad, 2017). Molina and Peru (2007) concluded that the rural women are more aware than the urban women, because they understand their needs depend on the natural resources. Hosseinneshad (2017) showed that women consider the environment in a more supportive manner.

In this paper, environmental attitudes, concerns, skill, knowledge, and behaviors were studied among rural women. In addition, development of agriculture (Singh, 2000) not only enhances the people's life quality but also causes a number of serious environmental problems such as soil degradation, air and water pollution, and so on. Therefore, another objective of this study was whether there was any significant difference in EL between townships of Kermanshah Province with different degrees of agricultural development. Finally, the appropriate methods for EL extension was studied.

## MATERIALS AND METHODS

Kermanshah Province is one of the mountainous regions located in the west of Iran and consists of 14 townships. Existence of fertile soil and various climates in Kermanshah Province provide the possibility of planting the majority of agricultural products. This region is one of the main agricultural centers in west of Iran and rural women participate in most production activities.

Rural women of Kermanshah Province (15-64 ages) were statistical population of this descriptive-correlational research (N= 203,504). Sample members were selected by Bartlett *et al.* (2001) table (n= 384). A modified stratified random sampling technique was followed to select the sample. The

classification was carried out based on the agricultural development level of the regions (undeveloped, developing, and developed) (Tavakoli, 2013). It was assumed that the variability of EL between different regions was high and within each region was low. In the first stage, 3 townships (Pave, Gilan-e-Gharb and Kermanshah) were randomly selected in 3 zones of agriculturally undeveloped, developing and developed. In the second stage, seven Dehestan (district or a collection of villages), and then several villages were randomly selected from each Dehestan (Figure 1).

Data were acquired by the use of a questionnaire, whose validity was confirmed by a panel of expert of rural sociology, environment and natural resources, and agricultural education and extension, and its reliability was confirmed by Cronbach's alpha (0.86–0.93). Researchers assigned correct responses with a score of one (1) and zero (0) for incorrect responses in environmental knowledge component. With 30 items, the lowest possible score for environmental knowledge domain is zero, and thirty for the highest possible score. As for the other dimensions of the EL, attitude and concern were measured using Likert scale (1= Strongly disagree, 2= Disagree, 3= Undecided, 4= Agree and 5= Strongly agree), Skill (1= Very low, 2= Low, 3= Moderate, 4= High and 5=

Very high), and behavior (1= Never, 2= Rarely, 3= Sometimes, 4= Often, and 5= Always) were also measured in 5-point Likert scale. Range of score was different among all dimensions, accordingly, score was calculated from 20 for each of the EL components and finally EL score was obtained out of 100.

The study population of qualitative section consisted of experts of agriculture extension, environment and natural resources, as well as rural women. Samples were selected using purposeful sampling and snowball technique. After identifying the appropriate methods for EL extension by experts, each method was described as a scenario for women. Then, they chose the appropriate methods using a paired matrix. At this phase, one village was selected from each township, with the participation of the administrative council of the township. Rural women in selected villages were interviewed through purposeful sampling in the process of choosing suitable extension methods.

## RESULTS AND DISCUSSION

### Demographic and Personal Characteristics of Rural Women

In this study, only 50.3% of the

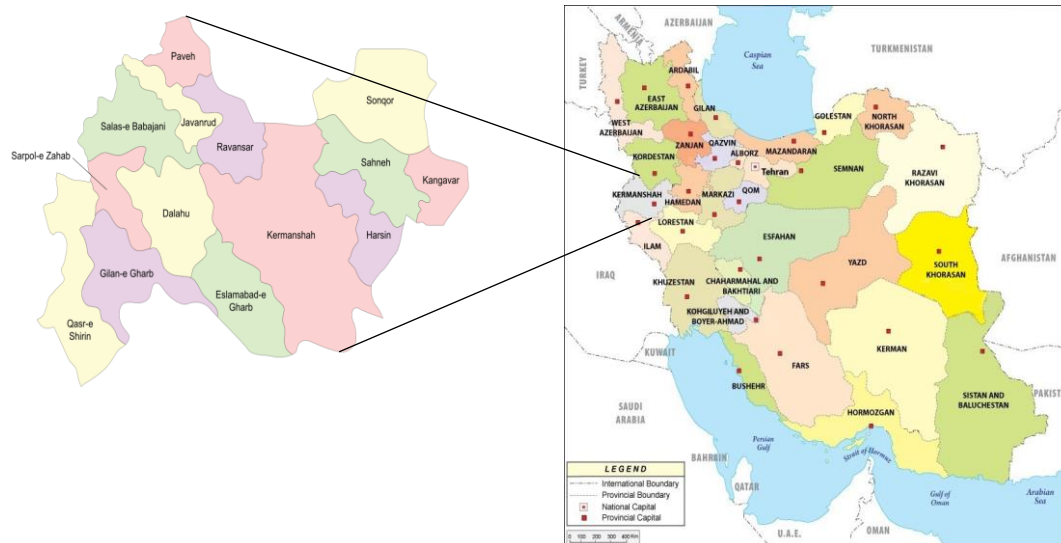


Figure 1. Location of Kermanshah Province in Iran and townships of the study.

respondents were homemakers; the average age was 34.6 years and 72% were married. Also, 62.2% of rural women were illiterate and the majority did not have any sources for environmental information or did not use information resources (62.2%). Rural women's information resources for obtaining environmental information are radio and television (17.4%) and family and friends (15.4%).

### Rural Women's EL

An EL composite score resulted from adding the five components scores of EL, yielding a possible composite score of 100 points. Table 1 shows summary of descriptive results for three townships on parts of the EL.

The mean of EL of rural women are reported in Table 1. The highest component scores were noted in environmental attitude followed by environmental skill, environmental behavior, environmental knowledge, and environmental concern. Overall, the level of EL in Kermanshah Province is moderate ( $M = 61.427$ ,  $SD = 8.003$ ). The results of this study were similar to other studies, which showed that environmental attitudes are the highest (Scott and Willits, 1994; Kibert, 2000; Hosseinneshad, 2017). Attitude is one of the main variables in EL that is used as a predictor of environmental behavior (Pe'er *et al.*, 2007). Many people consider themselves as a protector of environment, but they do not protect the environment based on their positive attitude (Thompson and Barton, 1994). Results showed that environmental attitude has failed in

promoting environmental behavior of women. It seems that attitude is not sufficient to accomplish a task of environmental protection.

According to the data, environmental concerns were moderate. These results have also been confirmed in previous studies (Karami and Mansoorabadi, 2008). Concern shows sensitivity of people about problems of natural resource and environment. Since concerns about environment are increased, women will pay more attention to protect the environment. Moderate level of environmental concern suggests that environmental issues are not well known in the society. These results contradict the research results of Eshaghi *et al.* (2015), because they concluded that most villagers have a high environmental concern. Increasing women's awareness of environmental issues through the media is necessary to stimulate their sensitivity and concern.

Knowledge and skill are two main prerequisites for deciding about preservation of nature. Both of them help women in discovery, analysis, and providing the solutions for environmental problems. In this study, the knowledge and skill level of rural women were moderate. Based on data, environmental knowledge was the lowest component of EL. The results of previous studies also showed that women's awareness of environmental issues was negligible (Karimi, 2002). Study of Varaste Far and Mokhtari (2010) confirmed that rural women had low environmental knowledge. Low knowledge of rural women can be related to limited access to information resources, their lower educational level,

**Table 1.** Descriptive statistics of variables of Rural Women's EL.

EL components	No of items	Mean	SD
Environmental attitude	9	14.498	2.831
Environmental concern	9	11.926	2.328
Environmental skill	6	12.521	3.126
Environmental knowledge	30	10.292	3.293
Environmental behavior	65	12.191	1.639
EL	119	61.427	8.003



and/or not benefiting from environmental information due to illiteracy or low literacy. Hadipour and Shakouri (2004) argue that unawareness of people has been caused by a lack of information. Therefore, another reason may be related to the lack of media attention to broadcast EE programs. Sometimes, the time of EE programs is inappropriate for women, thus they cannot participate in training courses. Environmental skills, in addition to knowledge, require the ability to think, analyze and make decisions. These abilities will be achieved through the strengthening of the power of women's thinking and reasoning, which requires education and participation of women in rural society. Therefore, the level of

environmental knowledge and skills of rural women should be enhanced through extension education programs, with priority given to remote rural areas. Findings indicated that mean of environmental behavior of rural women was moderate. Research results of Azizi *et al.* (2012) shows that environmental behaviors of women are not in accordance with environmental principles. A part of the environmental damage is the result of the inappropriate behavior of humans towards the nature (Bijani *et al.*, 2017), therefore, fostering environmental behaviors among women is important. Rural women's responses on the environmental attitudes, concern, skill, knowledge, and behavior items are shown in

**Table 2.** Descriptive statistics of each items of rural women's environmental attitude, concern, and skill variables.

	Items	Mean	SD
Attitude	Plants and animals have as much the right to live as humans.	3.74	1.04
	Protecting the environment requires the participation of all people.	3.70	1.09
	As a rural woman, I am in charge of helping solve the environmental problems and doing everything in my power.	3.70	1.12
	It is very important for everyone to be aware of environmental problems.	3.70	1.15
	Having a healthy environment is vital for all generations and it is their right.	3.60	1.12
	People should accept responsibility for any damage to the environment.	3.60	1.16
	When we intervene too much in nature, there is an environmental disaster.	3.59	1.11
	environment and natural resources are for humans and they can use them as much as they want.	3.50	1.17
	I am ready to be a member of the groups that work on protecting the environment	3.48	1.12
Concern	The dangers that occur in Iran are alarming.	3.44	1.05
	I'm concerned about the extinction rate of plants and animals.	3.36	0.94
	We must have enough laws in the country (such as non-hunting) to protect the environment.	3.28	1.08
	The erosion of pastures and forest areas for agricultural work does not make me worried.	3.08	1.08
	I think most of the concern about environmental problems like pollution of water, air, soil degradation, and so on has been exaggerated.	3.02	1.20
	I am concerned about the increased use of chemical fertilizers and pesticides in the agricultural sector.	3.00	1.00
	More controls should be placed on agricultural sector to protect the quality of the environment (such as reducing fertilizer use and promoting the use of organic fertilizers).	2.79	0.92
	I'm not concerned about how much waste is produced in this country.	2.56	0.85
	Suitable water consumption and reduced energy consumption (such as electricity, oil, gasoline, etc.) are my concerns.	2.30	0.93
Skill	If environmental damages occur in the village (such as the problem of water pollution, soil degradation, etc.), I can recognize them.	3.54	1.21
	If I want to start a new activity such as cultivating saffron in the village, I can recognize that my village has the capacity to do so.	3.27	1.24
	If there is a problem like water pollution, after examining the available evidence, I can identify what was the cause.	3.19	1.16
	When I encounter an environmental problem, I comment on it based on what I know (knowledge or native knowledge).	3.16	1.21
	If there is a problem such as rangeland degradation in the village, I can provide a solution to solve or reduce it.	2.89	1.26
	When I propose a solution, I can defend it and convince others to accept it.	2.72	1.25

**Table 3.** Descriptive statistics of various sections of rural women's environmental knowledge.

Knowledge	No of items	Correct (%)	Incorrect (%)
Energy	4	58.98	41.02
Waste	4	55.73	44.27
Green consumption	4	53.06	46.94
Water	4	50.78	49.22
Soil and air	4	46.81	53.19
Agriculture and natural resources	10	48.23	51.77

**Table 4.** Descriptive statistics of various sections of rural women's environmental behavior.

Behavior	No of items	Mean	SD
Water and energy management	18	3.65	0.62
Waste management and Green consumption	22	2.89	0.47
Participatory and social behavior for the preservation of the environment	11	2.87	0.67
Preservation of agricultural resources	14	2.66	0.58

Tables 2, 3, and 4.

According to Table 2, the item of "plants and animals have the right to live as much as humans" has the highest average of rural women's environmental attitude items ( $M=3.74$ ,  $SD=1.04$ ). In comparison with other cases, the item on "The dangers that occur in Iran are alarming" has the highest average in environmental concern items ( $M=3.44$ ,  $SD=1.05$ ). Also, the skill of identifying environmental problems is higher than other skills ( $M=3.54$ ,  $SD=1.21$ ). Based on Table 3, women in the knowledge of energy management have the highest rate of correct response (58.98% correct answer) relative to other section.

According to the findings of Table 4, women's participatory behaviors for environmental protection and afterwards preservation of agricultural resources behavior are lower than the average, and are not in good condition.

MANOVA was used to test the differences among three townships in the various components of EL. MANOVA test statistics for the EL data are statistically significant ( $P<.01$ ). According to Table 5, there are significant differences in EL dimensions between the three townships. From five dimensions of EL, only environmental behavior and concern are not significant. Thus, there is no difference between

townships in rural women's environmental concern and behavior.

Results indicated that there was a significant difference among environmental knowledge of rural women based on their living place. Rural women of developed townships, which have more access to the media, access to education and continue to study, have higher environmental knowledge. Also, villages in developed townships had a significant difference with villages of undeveloped township in the environmental attitude. Therefore, it can be said that in underdeveloped agricultural areas, the amount of intervention in nature is less, the use of indigenous methods and local solutions is more, and hence protection of the environment is rooted in women's attitudes. However, at the provincial and national level, this difference is usually reversed. Although there is no significant difference between townships in environmental concern and behavior, the average environmental concerns and behavior in an undeveloped township is higher. One of the reasons can be attributed to the consumption pattern, like developed township, its villages also have tended toward more consumerism behavior. Also, the developed regions, because of higher incomes, have excessive consumption of chemical inputs.

**Table 5.** Results of Multiple Comparisons of EL components between townships. <sup>a</sup>

Dependent variable	(I) Township	Mean	SD	(J) Township	P
Attitude	Kermanshah	14.076	2.824	G	0.057
				P	0.000
	Gilan-e-Gharb	14.986	2.497	K	0.057
				P	0.026
Concern	Pave	16.434	2.433	K	0.000
				G	0.026
	Kermanshah	11.758	2.283	G	0.322
				P	0.134
Skill	Gilan-e-Gharb	12.243	2.200	K	0.322
				P	0.836
	Pave	12.515	2.677	K	0.134
				G	0.836
Knowledge	Kermanshah	12.894	3.127	G	0.135
				P	0.000
	Gilan-e-Gharb	12.042	2.899	K	0.135
				P	0.154
Behavior	Pave	10.879	2.864	K	0.000
				G	0.154
	Kermanshah	10.693	3.244	G	0.016
				P	0.009
	Gilan-e-Gharb	9.396	3.014	K	0.016
				P	0.880
	Pave	9.076	3.496	K	0.009
				G	0.880
	Kermanshah	12.146	1.615	G	0.949
				P	0.552
	Gilan-e-Gharb	12.219	1.674	K	0.949
				P	0.796
	Pave	12.436	1.751	K	0.552
				G	0.796

<sup>a</sup> (I): The first Township, (J): The second Township, P: Pave, K: Kermanshah, G: Gilan-e-Gharb

### Extension Methods for Rural Women's EL

Based on experts' opinion, the extension methods for rural women's EL should have some characteristics as bellow (Table 6).

Based on the features mentioned, the best methods were identified by experts in each component and were eventually prioritized by rural women (Table 7).

According to Table 7, group discussion was the most appropriate method for changing attitudes of rural women. Group discussion makes learning deeper and more durable (Malakouti, 2010). The results of previous studies have shown that group discussion is one of the preferences of

villagers in choosing educational methods (Franz *et al.*, 2010). Women also disagree with Q and A method. Maybe, women do not like to be asked the questions they may not know the answer, and this is accompanied by a decrease in their self-esteem. Field trip was not intended for women in undeveloped villages. This is due to their culture and social conditions. Men (father, brother, or spouse) may not allow women to attend these trips. The results of previous studies also indicate that men's opposition is one of the barriers of women's participation in social activities and extension programs (Vosoughi and Yousefi Aghabin, 2005; Mirakzadeh *et al.*, 2010). Therefore, one of the reasons for not choosing field trip by women is their

**Table 6.** Characteristics of selecting methods for EL extension.

Characteristics	frequency
The methods are determined by objectives.	6
All methods must be used, but the priority is participatory methods.	5
Learning through action, and learning as much mastering, is effective in increasing skill.	5
Methods should be selected by considering the facilities and conditions of the rural community.	4
The peer group responds better.	4
Do not limit training to the classroom.	4
Train the women in free time.	4
Exercising outdoor education is better (environment-based learning).	4
The service learning and problem-based approach to environmental education has been widely used.	3
Each method requires a series of teaching aids that should be available to the educator.	3
The use of complementary and complementary methods should be put on the agenda.	3
Use a variety of methods tailored to the age and characteristics of the audience.	2
Information sharing should be taken into consideration (network learning).	1
Group education gives better results (phenomenon of Crowd).	1

restriction to travel outside the village. This is more severe in underdeveloped villages.

Women in developed villages recognized short messages and telephone calls as the best way to create environmental concerns, while for women in underdeveloped villages, radio and television gained the first priority. Underdeveloped villages were more interested in using radio and television for the above purpose, because information provided through radio and television is commonly understood and used by people with low literacy. On the other hand, access to this media is possible for most rural women in underdeveloped areas. Internet and field trips also had the lowest priority for women. Rural women recognized lecture and radio and television as the most appropriate methods for increasing knowledge about environment protection. Field trips and Q and A methods were not prioritized. Education through radio and television is very important in rural areas, because these are the only media that most rural people have access to it. Previous research has shown that farmers have learned to control forest fires through radio programs (Elfving and Ristimaki, 2011), although these media usually do not go beyond the level of awareness. However, radio and television are one of the most important sources of learning knowledge

about environmental issues (Safari *et al.*, 2009).

In undeveloped villages, rural women recognized demonstration as the best way to develop environmental skills. Earlier research has confirmed this (Miller and Cox; 2006; Allahyari *et al.*, 2009; Tiraieyari *et al.*, 2010; Hoang and Radhakrishna, 2013). However, in terms of women in developed villages, the environmental skills can be strengthened through the method of action research; as they learn in a research process, they will help solve the problems of their village environment. This approach is proposed in Canada for the education of EL (Einsiedel Jr, 1996). Problem solving and group researches were not prioritized to improve environmental skills of women. The reason is that rural women are less likely to trust the activities that challenge them. Field trips, and radio and television were also not a priority for promoting environmental behavior. In terms of rural women, field trips are not appropriate for women, and this method is more effective for men. As the results show, the economic, social and cultural conditions of women, such as the low level of women's literacy, lack of access to infrastructure, commute and movement problems and the culture of the village, restricts the use of extension methods. Therefore, extension educational

**Table 7.** Methods of EL Extension from women's perspective.

	Attitude			Concern			Skill		Knowledge		Behavior	
	Developed villages	Undeveloped villages	Group discussion	Developed villages	SMS and phone conversations	Undeveloped villages	Developed villages	Undeveloped villages	Developed villages	Undeveloped villages	Developed villages	Undeveloped villages
Group discussion	Group discussion	Group discussion	Group discussion	SMS and phone conversations	Radio and TV	Participatory action research	Lecture	Lecture	Participatory action research	Demonstration	Teamwork	Participatory action research
Books, journals and magazines	Personal contact with change agent	Personal contact with change agent	Personal contact with change agent	Group discussions	Lecture	Teamwork	Consultations with subject specialists	Magazines and publications	Radio and TV	Personal contact with change agent	Internship	Participatory action research
Visits and field trips	Teamwork	Teamwork	Teamwork	Radio and TV	Group discussions	Internship	Participatory action research	SMS and phone conversations	Radio and TV	SMS and phone conversations	Demonstration	Participatory action research
Educational film	Books, journals and magazines	Books, journals and magazines	Books, journals and magazines	Magazines and publications	SMS and phone conversations	Educational film	Competitions	Personal contact with change agent	Magazines and publications	Magazines and publications	Educational film	Educational film
Teamwork	Debate	Debate	Debate	Lecture	Magazines and publications	Consultations with subject specialists	Internship	Internet and social networks	Internet and social networks	Educational film	Visits and field trips	Radio and TV
Debate	Question and answer	Question and answer	Question and answer	Visits and field trips	Internet and social networks	Educational film	Educational film	Internet and social networks	Internet and social networks	Internet and social networks	Radio and TV	Visits and field trips
Question and answer	Visits and field trips	Visits and field trips	Visits and field trips	Internet and social networks	Visits and field trips	Group research	Problem Solving	Poster	Poster	Exhibitions	-	-
-	-	-	-	-	-	Problem Solving	Group research	Exhibitions	Exhibitions	Poster	-	-
-	-	-	-	-	-	-	-	Question and answer	Question and answer	Question and answer	-	-
-	-	-	-	-	-	-	-	Visits and field trips	Visits and field trips	Visits and field trips	-	-

methods should be selected according to women conditions.

## CONCLUSIONS

Environmental problems in rural areas are increasing due to agricultural and livelihood activities. Rural women are household manager and users of natural resource, and they need new information to protect the environment and increasing their EL. Therefore, this research was conducted with the aim of determining the level of EL of rural women and methods to promote its components in Kermanshah Province. In this research, an integrated literacy framework including attitude, concern, skill, knowledge, and environmental behaviors was used, which was more comprehensive than other frameworks. Findings indicated that women had a positive attitude, but they had only moderate levels of knowledge, concern, skill, and behavior. Rural women who lived in undeveloped villages had a more environmentally friendly attitude. In return, rural women in developed villages had higher knowledge and skills than others. Rural women who had a positive environmental attitude behaved more responsible toward environment. This shows that all rural women need EE, but the priority of education can be different. Thus, the extension of positive environmental attitudes in rural women in developed township and the promotion of knowledge and skills of rural women in underdeveloped and developing township is a priority. Also, rural women had relatively low environmental concerns, so, it is suggested that increasing environmental concerns should be done in rural women through warning about the dangers that threaten the environment and the effects that these risks have on human life. Based on the results, the priority of educational content for women's education programs is agricultural knowledge and conservation of natural resources. It should be said that poor women are likely to be more dependent on

resources, and have more pressure on resources, while rich women, by following the culture of urban consumption, are less aware of waste management and green consumption. Therefore, it is advisable that all women be taken into consideration in developing appropriate educational programs. In order to develop successful and comprehensive educational programs for women, it is recommended that the extension, environment and natural resources departments collaborate to prevent duplicating work and wasting of resources.

Education and encouraging people to form and develop community organizations to solve environmental problems is a necessity that is felt in the community, and one of the extension goals is to organize and support Non-governmental Organizations for the empowerment of rural communities. Therefore, in order to preserve the rural environment and promote participatory and social environmental behaviors, formation of women's organizations is important. The formation of women's organizations provides good conditions to achieve participatory learning and action. Extension of EL and its components among rural women will lead to the preservation of the rural environment and enhancement of environmental responsibility in the community. Thus, EE of rural women should be integrated in women's specific programs. Given that most rural women do not have a source for environmental information or do not use information resources, it is suggested that women's access to media and communicational tools be increased, especially in deprived villages. It should be noted that not all educational methods are pleasant for rural women, and the choice of educational methods by educators is critical. Educational methods should be determined according to the situation. This requires understanding the types of educational methods by the extension agent and the manner and conditions in which they are used. Accordingly, it is suggested that extension agents be trained to achieve such cognition.



It is also suggested that educators familiarize themselves with the general principles of collaborative approach in order to provide the context for its application in rural women's education.

Overall, the results of this study can be used by rural women, as well as departments of extension and environment and natural resource. Also, the results can be applied by the planners of the formal education system to reform the curriculum of rural girls' schools.

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## سواد زیست محیطی زنان روستایی در استان کرمانشاه: یک چشم‌انداز ترویجی

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### چکیده

حفظ محیط زیست به عنوان یکی از پایه‌های اصلی زندگی انسان، نیاز به توجه و تلاش همه افراد، به ویژه زنان دارد، و پیش‌نیاز آن سواد زیست محیطی (EL) است. هدف پژوهش حاضر، بررسی میزان سواد زیست محیطی زنان روستایی و شناسایی روش‌های مناسب ترویج سواد زیست محیطی در میان آنها بود. جامعه آماری پژوهش شامل ۲۰۳۵۰۴ زن روستایی (سنین ۱۵-۶۴ سال) بودند که ۳۸۴ زن به عنوان نمونه و با استفاده از روش نمونه‌گیری طبقه‌ای تصادفی اصلاح شده انتخاب شدند. به منظور گردآوری اطلاعات، یک پرسشنامه تهیه شد که شامل مولفه‌های نگرش، نگرانی، دانش، مهارت و رفتار زیست محیطی بود. روایی پرسشنامه توسط پانل متخصصان و پایایی آن با استفاده از آلفای کرونباخ (۰/۸۶-۰/۹۳) تایید شد. در بخش کیفی، جامعه مورد مطالعه صاحب‌نظران حوزه ترویج کشاورزی، محیط زیست و منابع طبیعی و همچنین زنان روستایی بودند و نمونه‌ها با روش نمونه‌گیری هدفمند و تکنیک گلوله برفی انتخاب شدند. نتایج بخش کمی نشان داد که سطح سواد زیست محیطی زنان روستایی متوسط است (میانگین=۶۱/۴۲۷ و انحراف معیار=۸/۰۰۳) و سطح دانش (میانگین=۱۰/۲۹۲ و انحراف معیار=۳/۲۹۳) و نگرانی زیست محیطی (میانگین=۱۱/۹۲۶ و انحراف معیار=۲/۳۲۸) پایین‌تر از ابعاد دیگر بود. تجزیه و تحلیل MANOVA نیز نشان داد که در سطح سواد زیست محیطی زنان روستایی در شهرستان‌های مختلف با درجه‌های متفاوت توسعه یافتگی کشاورزی تفاوت معنی‌داری وجود دارد. زنان روستایی در مناطق توسعه یافته دانش و مهارت‌های زیست محیطی بالاتری دارند، اما رفتار زیست محیطی آنها به زنان روستایی مناطق توسعه نیافته و در حال توسعه نزدیک است. نتایج بخش کیفی نیز نشان داد که روش‌های ترویج سواد زیست محیطی زنان روستایی در مناطق مختلف تفاوت چندانی با هم ندارند، اما زنان روستاهای توسعه یافته تمایل بیشتری به روش‌های مشارکتی دارند. نتایج



این مطالعه می‌تواند به بهبود برنامه‌های زیست محیطی به منظور ترویج سواد زیست محیطی در سراسر جامعه کمک کند.