

Factors Influencing People's Participation in Sustainable Natural Resources Management: A Case Study in Central Iran

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ABSTRACT

Today, identifying and evaluating the factors that influence People's Participation (PP) in Sustainable Natural Resource Management (SNRM) are the most common challenges that natural resource scientists should address. The purpose of this study was to understand the demographic, socio-cultural, and religious factors that influence PP in SNRM in Isfahan city, Iran. Using a multi-stage, stratified random sampling method, 200 experts and natural resource users were selected through Cronbach's Alpha coefficient (0.93). Data was collected using a researcher-made questionnaire. A panel of experts and Cronbach's Alpha coefficient, respectively, approved the content validity and reliability of the questionnaire. Results showed that public awareness factors were the key elements when approaching SNRM in the view of natural resource experts, while natural resource users identified religious characteristics as the key factors that influence PP. Furthermore, the results indicated that there was no significant difference between personal characteristics (age, education background, marital status) and PP in SNRM. Thus, it can be concluded that the natural resource experts and users perceive the factors that influence the adoption of SNRM approaches differently. Since these factors are still poorly understood and vary widely across the country, more research is needed in order to better understand the PP and adoption of SNRM.

Keywords: Cronbach's Alpha, Public awareness, Religious factors, Sociocultural factors.

INTRODUCTION

In recent years, participatory approaches to Natural Resource Management (NRM) have been recognized to promote the adoption of Sustainable Natural Resource Management (SNRM) and to reduce conflicts associated with management (Mitchell, 2005; Parkins and Mitchell, 2005; Romina, 2014; Rowe and Frewer, 2005). Previous studies have demonstrated that benefits for all parties accrue from the People's Participation (PP) in the decision-making process (Fraser *et al.*, 2006; Mitchell, 2005; Parkins and Mitchell, 2005). PP for optimal ecosystem management

is inevitably dispersed among the different levels of organizations. Although in recent decades, public knowledge regarding natural resource issues and crises has increased, there has not been a lot of success in controlling these crises. The lack of PP in the decision-making process and natural resource monitoring programs is one of the main challenges to achieve SNRM (Fraser *et al.*, 2006; Mitchell, 2005; Romina, 2014).

In the late 1960s and early 1970s, many scholars focused on the issue of PP in NRM decision-making situations (Arnstein, 1969). Since the 1990s, PP literature has rapidly increased. A significant volume of literature is

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devoted to the use of different and increasingly technical methods to understand people's preferences and values. Other sections of literature examine the use of people's participation in order to address specific issues, including environmental assessments and the options that natural resource managers choose in their policies. Sheppard (2005) notes that, in Canada, public participation processes in natural resource decisions have had limited value given the preferred use of more "traditional" methods of public engagement. Some studies attempted to show how PP contributes to the larger goals in NRM (Armitage *et al.*, 2008). After 40 years of research and practice, there is still no clear consensus on what factors influence PP in SNRM.

There are many factors to deal with PP in NRM, including social, political, cultural, religious, economic, and psychological dimensions, even customs (Ghorbani *et al.*, 2015; Arayesh and Mammi, 2010; Khalili *et al.*, 2014; Raufi *et al.*, 2014). The complex nature of PP in SNRM has made its driving forces, their relationships, and processes extremely important for different stakeholders, including scientists, natural resource managers, and policy makers in order to develop the appropriate strategies (by identifying effective factors that influence PP) that can increase PP in SNRM. Attentions of many research scientists are attracted to the different perspectives of the factors that influence PP in SNRM. Each researcher has studied the effective factors on SNRM from different point of view. Fisher (1999) has all acknowledged the effect of institutions, popular organizations, and non-governmental organizations in SNRM. Other researchers believe that the government policies affect these situations (like obviating the limitations of personal ownership, decentralization and granting affairs, enforcing people-government relationship, executing obligations on behalf of the government, believing in people participation, the professional capabilities of the people in charge and specialists, informing people, finding people's problems, and proper policy making). Shariaati and Reza (2004),

construed the social factors (such as: social class, the kind of job, education, job experience, the attitude towards the project, empowering local associations, taking into account the indigenous knowledge, considering the right of ownership, making jobs, the existence and presence of local leaders) as effective factors in SNRM.

As natural resources and environmental management issues have grown (or have been recognized as) more complex, researchers are looking into different strategies in order to meet that complexity, particularly given that the need for integrated approaches that link different issues (social, economic, ecological, political and so on) to SNRM for that have been advocated (Booth and Halseth, 2012). Overall, according to previous studies, it can be inferred that a set of factors that affect PP in SNRM does, in fact, exist (Arayesh and Farajollah, 2010; Hejazi and Arabi, 2009; Khalili *et al.*, 2014; Raufirad *et al.*, 2014) and, so far, much consideration has been given to those factors that influence PP in SNRM (Berkes, 2009; Berkes, 2010; Booth and Halseth, 2012; Cornwall, 2008; Zurba and Trimble, 2014). Nevertheless, little attention has been given to the role of sociocultural, customs, and religious factors (commonly) in SNRM. Through an extensive review of the literature in SNRM, the authors of this paper identified this lack of attention is a significant gap in the field. Here, we aim to contribute to filling the gap in order to understand how people will participate in SNRM.

Recently, Iran has been reported more frequently for its unsustainable NRM, induced by a set of drivers (such as biophysical, sociocultural, religious, etc.), and even though the biophysical drivers of this situation have widely been studied by many Iranian scholars (Shaditalab, 2003; Shariaati and Reza, 2004; Motevali, 2004; Hosseini and Faham, 2006), little is known about the role of sociocultural and religious factors as well as personal characteristics that influence PP in SNRM. Therefore, the main objectives of this study were to: (1) Identify important factors (sociocultural, religious, public awareness, informative advertising, and customs) that

affect PP in SNRM in Isfahan city, Iran, and (2) Determine the differences between natural resources experts and natural resources users regarding their perceptions of the key factors.

MATERIALS AND METHODS

The city of Isfahan is located in the Isfahan province and is the provincial capital. It is located within $30^{\circ} 42'$ and $34^{\circ} 30'$ north latitude and $49^{\circ} 36'$ and $55^{\circ} 32'$ east longitude. Isfahan covers an area of approximately $16,110.375 \text{ km}^2$ and is situated in the center of Iran. Isfahan experiences a moderate and dry climate on the whole, with annual average of maximum and minimum temperature ranging between 40.6 and 10.6°C . The average annual temperature has been recorded as 16.7°C and the annual rainfall, on average, has been reported as 116.9 mm (Figure 1). In total, according to the Natural Resources Organization of Isfahan Province (NROIP), Isfahan covers 854790 ha of natural resources, including rangeland,

desert and dry jungles. Serious efforts and investment in the restoration, protection, and conservation of natural resources in Isfahan city have been undertaken, but with a low level of PP, making the current study even more important.

Data Collection and Sampling Method

To collect the data, first, direct face-to-face interviews were conducted with two main groups of stakeholders: executive experts and natural resource users, by using a researcher-made questionnaire. A panel of experts (researchers and executive officers) approved the content validity and Cronbach's Alpha coefficient was used to test the reliability of the questionnaire. The questionnaire was developed as an instrument of this study after review of the relevant literature suggested that the drivers of LPP in SNRM can be broken down into five main groups (sociocultural, religious, custom, public awareness, and informative advertising). These factors were translated

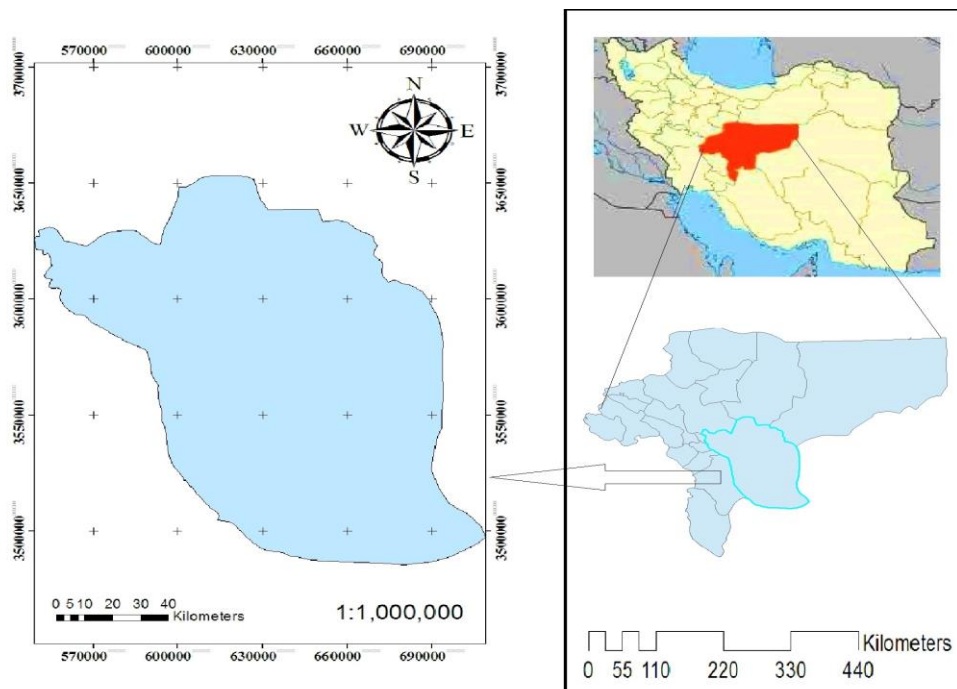


Figure 1. The location of the study area.



into a questionnaire.

Through a multi-stage, stratified sampling method 200 Natural Resource Experts (NRE), professional managers who were specialized in natural resources, and Natural Resource Users (NRUs) i.e. the people who use natural resources for herding and similar uses, were selected in the study area. The sample size was calculated based on Cochran's formula (Azadi et al., 2013; Azadi, et al., 2011) (Equation 1):

$$n = \frac{N(ts)^2}{Nd^2 + (ts)^2} = 200 \quad (1)$$

Where, n is the sample, N is the population (485), t is the t student ($t= 1.96$; Prob.= 0.95), s is the standard deviation of the 30 respondents in the pilot study (0.94), and d is the preferred likelihood accuracy (0.10).

Finally, the NRE and NRU were asked to express their opinions in regard to each factor using the Likert continuum (1: No effect on PP in SNRM; 2: Little effect on PP in SNRM; 3: Some effect on PP in SNRM; 4: Large effect on PP in SNRM, and 5: Great effect on PP in SNRM).

Data Analysis

Different data analyses were used to test the hypotheses of the study using SPSS (Version 18). We analyzed the data using statistical testing as well as descriptive analyses (Mean, SD, and CV) and inferential analyses (Anova) (Seigel, 1956). The data was analyzed using two groups: a group of personal characteristics and a non-personal group. The latter consisted of five factors: sociocultural, religious, information and awareness, public awareness campaigns, and customs. The personal characteristics consisted of three factors: age, education background, and marital status. The reliability of the main factors of the study (sociocultural, religious, informative advertising, public awareness, and customs) was confirmed using Cronbach's Alpha coefficients, as shown in Table 1.

RESULTS

Factors Influencing PP in SNRM from Expert's Point of View

According to the experts' opinions (Table 2), PP in SNRM had a significant relationship ($P \leq 0.01$, $F= 20.194$) with the factors of sociocultural, informative advertising, religion, and customs. Additionally, the public awareness campaigns, sociocultural, information and awareness, religion, and customs factors (with, respectively, 0.175, 0.198, 0.209, 0.254 and 0.285 coefficients of variation) were recognized as the most important factors that influence PP in SNRM.

Natural Resources Users Point of View

As Table 3 shows, a significant relation ($P < 0.01$, $F= 37.931$) was found between the factors sociocultural, information and

Table 1. Cronbach's Alpha for the main factors of the study.

Factors	α^a
Sociocultural	0.83
Religious	0.88
Informative advertising	0.86
Public awareness	0.93
Customs	0.74
Total	0.93

^a $\alpha \geq 0.9$: Excellent; $0.9 > \alpha \geq 0.8$: Good, $0.8 > \alpha \geq 0.7$: Acceptable.

Table 2. Descriptive statistics factors influencing PP in SNRM from experts' point of view.

Factors	Mean	SD	CV
Public awareness	50.16	8.8	0.175
Sociocultural	39.11	7.73	0.198
Informative advertising	20.23	4.23	0.209
Religious	21.6	5.49	0.254
Customs	13.07	3.73	0.285
<i>F</i>		20.194	
<i>P</i> -value		0.0001	

awareness, religious, and customs and people's participation in SNRM from the natural resources users' point of view. The religious, sociocultural, customs, informative advertising and public awareness factors (with, respectively, 0.175, 0.198, 0.209, 0.254, and 0.285 coefficients of variation) were also recognized as the most important factors that influence PP in SNRM.

Personal Characters and Their Relation with PP in SNRM

According to the findings of this study, the average age of the interviewees was 40 years. More than half of the interviewees were adults (Range: 41-60; Mean: 50.7 years) and 24.5% were young (Range: 20-30; Mean: 25 years). The majority of the respondents held a primary education degree (31.5%) while those with secondary and post-secondary education comprised only 5.5 and 11%, respectively. The others (52%) had higher education.

Age

From the experts' point of view, age didn't have a significant impact ($P \leq 0.05$) on PP in SNRM. In general, the effect of sociocultural and information and awareness factors were the highest among the respondents 51-60 years old. The effect of public awareness campaigns, customs, and religious factors were the

Table 3. Descriptive statistics factors influencing PP in SNRM from natural resources users' point of view.

Factors	Mean	SD	CV
Religious	23.2	4.78	0.206
Sociocultural	34.9	7.69	0.220
Customs	14.6	3.36	0.230
Informative advertising	17.18	4.09	0.238
Public awareness	35.44	10.54	0.297
<i>F</i>	37.931		
<i>P</i> -value	0.0001		

highest among respondents over 60 years old (Table 4).

Age had no significant impact ($P \leq 0.05$) on people's participation in SNRM from the natural resources users' point of view, too. In total, the effect of sociocultural, religious, and public awareness factors was the highest among respondents younger than 30 years. The effect of the factors information and awareness and customs were the highest among respondents over 60 years old.

Education Background

According to Tables 6 and 7, level of education did not have a significant effect on people's participation in SNRM (not only based on expert (Table 6) but also natural resources users' opinion (Table 7)). In general, each of the five factors, i.e. sociocultural, religious, information and awareness informative advertising, public awareness, and customs, had the highest

Table 4. The role of age on PP in SNRM from experts' point of view.

Factors	Age					Expert's point of view	
	< 30	31-40	41-50	51-60	> 60	<i>F</i>	<i>P</i> -value
Sociocultural	39.91 (4.11)	38.46 (8.6)	37.49 (7.6)	41.90 (7.5)^a	37.4 (10.1)	1.025	0.398
Religious	21.82 (3.7)	20.96 (4.9)	21.57 (6.3)	22.14 (6.2)	22.6 (3.8)	0.185	0.946
Informative advertising	19.45 (5.1)	19.68 (3.9)	20.37 (4.5)	21.33 (3.9)	19.40 (4.2)	0.616	0.652
Public awareness	51.36 (7.4)	52.25 (9.9)	48.97 (8.6)	48.10 (8.0)	52.80 (8.6)	1.01	0.408
Customs	12.60 (4.1)	12.71 (4.0)	13.06 (3.6)	12.81 (3.2)	14.73 (4.6)	0.644	0.632

^a The Bold numbers represent the highest amounts among the different SNRM factors.



value among respondents who had higher education. This means that, in spite of no significant difference between educational background and PP, increasing levels of formal education resulted in respondents being more likely to participate in SNRM.

Marital Status

Marital status also did not have a significant impact on people's participation

(Table 8 and 9). In general, the effect of all the factors, i.e. sociocultural, religious, public awareness, informative advertising, and customs, had the highest value among respondents that were single.

DISCUSSION

Collaborative decision-making is increasingly common in SNRM. However, the current and future involvement of PP in

Table 5. The role of age on PP in SNRM from natural resources users' point of view.

Factors	Age					Natural resource user's point of view	
	< 30	31-40	41-50	51-60	> 60	F	P-value
Sociocultural	34.63 (8.2)	34.50 (7.3)	36.25 (7.6)	34.61 (8.1)	34.00 (2.4)	0.193	0.942
Religious	23.71 (4.0)	21.25 (5.5)	23.60 (4.6)	23.61 (5.1)	24.25 (7.4)	1.059	0.381
Informative advertising	17.05 (3.9)	17.85 (4.9)	16.75 (3.9)	16.89 (4.2)	18.50 (3.7)	0.316	0.867
Public awareness	36.79 (12.3)	36.40 (8.96)	35.65 (8.8)	33.89 (9.1)	23.75 (11.9)	1.561	0.191
Customs	14.16 (3.5)	14.90 (3.5)	15.15 (3.2)	13.94 (3.5)	17.50 (0.6)	1.270	0.287

Table 6. The role of education background on PP in SNRM from experts' point of view.

Factors	Education background				Expert's point of view	
	Primary education	Secondary education	Post-secondary education	High education	F	P-value
Sociocultural	-	-	34.83 (8.9)	38.82 (8.8)	0.739	0.531
Religious	-	-	21.00 (5.2)	22.88 (5.6)	1.008	0.393
Informative advertising	-	-	18.67 (4.5)	20.00 (4.4)	0.647	0.570
Public awareness	-	-	48.83 (9.7)	51.50 (9.4)	0.487	0.692
Customs	-	-	12.50 (2.1)	13.12 (4.3)	0.077	0.972

Table 7. The role of education background on PP in SNRM from natural resources users' point of view.

Factors	Education background				Natural resource user's point of view	
	Primary education	Secondary education	Post-secondary education	High education	F	P-value
Sociocultural	34.83 (6.5)	36.91 (11.0)	32.63 (8.9)	37.70 (8.1)^a	1.183	0.320
Religious	23.33 (5.0)	22.82 (4.3)	23.56 (4.6)	24.20 (4.6)	0.211	0.889
Informative advertising	16.68 (3.9)	20.00 (5.04)	16.81 (3.6)	22.80 (3.9)	2.252	0.089
Public awareness	35.71 (9.9)	33.91 (10.8)	34.94 (13.4)	36.20 (10.2)	0.118	0.949
Customs	14.97 (3.2)	14.45 (4.2)	12.88 (3.3)	15.20 (3.3)	1.8181	0.149

^a The Bold numbers in Tables represent the highest amounts among the different SNRM factors.

Table 8. The role of marital status on PP in SNRM from experts' point of view.

Factors	Marital status		Parameter	
	Single	Married	F	P-value
Sociocultural	40.78 (7.49)^a	38.96 (7.78)	0.450	0.504
Religious	23.50 (5.35)	21.43 (5.51)	1.040	0.310
Information and awareness	29.50 (5.83)	21.43 (5.51)	0.257	0.614
Public awareness	53.25 (8.03)	20.29 (4.10)	1.073	0.303
Customs	52.88 (3.60)	49.89 (8.85)	0.024	0.878

^a The Bold numbers in Tables represent the highest amounts among the different SNRM factors.

Table 9. The role of marital status on PP in SNRM from natural resources users' point of view.

Factors	Marital status		Parameter	
	Single	Married	F	P-value
Sociocultural	44.69 (7.81)^a	35.67 (7.91)	0.127	0.722
Religious	23.31 (4.93)	21.67 (3.74)	0.942	0.334
Informative advertising	17.29 (4.03)	15.33 (3.74)	1.936	0.167
Public awareness	36.09 (10.34)	30.67 (3.74)	2.196	0.142
Customs	14.83 (3.28)	13.33 (3.71)	1.655	0.201

^a The Bold numbers in Tables represent the highest amounts among the different SNRM factors.

NRM, as well as the ways in which factors affect PP, have been poorly addressed thus far. Attracting people into active participation in NRM is a serious challenge (Booth and Halseth, 2012). Problems within SNRM are complex and there is a high amount of uncertainty, making prediction only possible to a limited extent and integrated approaches (Hosseini et al., 2013) to NRM that are advocated. Previous studies (Arayesh and Farajollah, 2010; Arayesh and Mammi, 2010; Khalili et al., 2014; Raufirad et al., 2014; Zurba and Trimble, 2014) showed that a variety of social, cultural, ecological, political, religious, and economic factors affect PP. Other studies have had more positive and similar findings (Mitchell, 2005; Roseland et al., 1998; Jackson and Curry, 2004).

In line with the above discussion and the studies carried out by Arayesh and Farajollah (2010), this study has shown that sociocultural, informative advertising, customs, and religious factors have a positive effect on the successes and failures of the use of people in participation processes. Accordingly, we can say that a set of complex factors are effective in participation processes. This means, as

NRM issues have grown (or have been recognized as) more complex, natural resource managers should look into different strategies in order to address that complexity, particularly given the need to link the different factors. Such strategies can be used as opportunities for multiple stakeholders to participate in the management of specific systems of natural resources. Unfortunately, this link between the different factors that influence PP in SNRM in Iran is very weak (Raufirad et al., 2014).

These findings also show that from the experts' point of view, informative advertising is the most important factor that influences PP in SNRM. After that, sociocultural, public awareness, religious, and customs were recognized as the most important factors, respectively. The results of our study also confirmed that since the value of informative advertising about natural resources in Iran is weak (Khalili et al., 2014; Raufirad et al., 2014), it is entirely understood that public awareness about the value of natural resources values would be poor as well. Such ignorance about the value of natural resources due to informative advertising is the reason why the processes



in NRM were seen to be failing by the people, why the implementation of many plans in the context of NRM in many areas of Iran have not led to the expected results, and why the plans have failed to reach sustainable development.

Furthermore, another issue that is almost never mentioned in other studies but became significant in our study, is the role of religious factors in SNRM. As the results showed, religious factors are the most important factor that influences people's participation in SNRM from natural resources users' point of view. This finding was confirmed by Stroup and Baden (1983), who showed that there was a strong association between beliefs, values, and norms on the one hand, and the attitudes toward the conservation of natural resource management, on the other. Hence, it can be inferred that local elites, such as religious leaders, can effectively enhance people's participation in SNRM. Taking their high social acceptance into account, these local religious leaders can greatly affect PP in SNRM. Another interesting result of our study is that sociocultural factors have the same importance based on the opinion of experts and natural resources users. This means that these factors, besides the religious factor, can result in increased people's participation in SNRM.

Finally, the results showed that personal characteristics (age, education background and marital status) did not affect people's participation in SNRM even though PP was related to increasing age and educational background. In other words, with increase in age, the motivation of PP increases, even though there is no significant difference ($P \leq 0.05$) between age and educational background with PP in SNRM as a whole. This finding is confirmed by Heydari *et al.*, (2009), Hosseininia *et al.* (2013), and Khatoonabadi (2001). Although Kunagy *et al.* (1994) and Mahler *et al.* (2008) showed that "personal characteristics" were significant factors in SNRM (especially in sustainable rangeland management); it was not identified as significant in our study. It

seems that additional research is needed to investigate people's participation in collaborative management in order to better understand the pp and adoption of SNRM. (Zurba and Trimble, 2014).

CONCLUSION

In conclusion, according to this study, people's participation in SNRM is very complex and the factors that influence people's participation in SNRM are, indeed, many. However, this study prioritized the role of some important factors (sociocultural, information and awareness, religious and customs) that affect people's participation in SNRM in Isfahan city region (although it should be noted that all the factors are important). The advertising and religious factors are more important according to the experts and users of natural resources. Furthermore, the sociocultural factors were the next highest priority affecting people's participation and had the same priority according to the views of both the experts and users of natural resources. Moreover, information and awareness and customs factors had lower priority. Hence, it is recommended that educational videos and publications, like simple booklets, public education, and the media, be used to advertise and increase people's awareness in order to contribute to the sustainable management of natural resources. Our findings also suggest that further research in different regions concerning these factors and other relevant factors, such as political factors, is required to better understand people's participation processes in SNRM.

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عوامل مؤثر بر مشارکت مردم در مدیریت منابع طبیعی پایدار (مطالعه موردی: مناطق مرکزی ایران)

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چکیده

امروزه، شناسایی و ارزیابی عواملی که بر روی مشارکت مردم در مدیریت منابع طبیعی پایدار مؤثر است، مهمترین چالشی است که دانشمندان منابع طبیعی باید رسیدگی کنند. هدف از این مطالعه، درک عوامل اجتماعی- فرهنگی، مذهبی مؤثر در مشارکت مردم در مدیریت منابع طبیعی پایدار در شهرستان اصفهان بود. با استفاده از نمونه برداری تصادفی چند مرحله‌ای، ۲۰۰ نفر از کارشناسان و بهره‌برداران منابع طبیعی از طریق ضریب آلفای کرونباخ (۰/۹۳) انتخاب شدند. اطلاعات با استفاده از پرسشنامه محقق-ساخته جمع آوری شد. روایی و پایایی پرسشنامه، به ترتیب، بوسیله طیفی از کارشناسان و ضریب

آلفای کرونیخ تعیین شد. نتایج نشان داد که از نظر کارشناسان منابع طبیعی، عوامل آگاهی عمومی از عناصر کلیدی مهم در مشارکت مردم در مدیریت منابع طبیعی پایدار است. در حالیکه بهره‌برداران منابع طبیعی، عوامل مذهبی به عنوان عامل کلیدی موثر شناخته شد. علاوه بر این، نتایج نشان داد که بین ویژگی‌های فردی (سن، تحصیلات، وضعیت تأهل) و مشارکت مردم در مدیریت منابع طبیعی پایدار تفاوت معنی‌داری وجود ندارد. بنابراین، می‌توان نتیجه گرفت که درک کارشناسان و بهره‌برداران منابع طبیعی در مورد عوامل موثر بر مشارکت مردم در مدیریت منابع طبیعی پایدار متفاوت است. از آنجایی که تفاوت گسترده‌ایی در کشور، از نظر این عوامل وجود دارد، تحقیقات بیشتری به منظور درک بهتر مشارکت مردم در مدیریت منابع طبیعی پایدار مورد نیاز است.

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