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Original research article

Pro-environmental analysis of farmers' concerns and behaviors towards soil conservation in central district of Sari County, Iran☆

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ABSTRACT

This study aimed to pro-environmentally analyze farmers' concerns and behaviors towards soil conservation. This research was a descriptive, causal, and correlational and conducted through a survey technique. The study population consisted of all farmers at the central district of Sari county, Iran (N=9621). Based on the Cochran's formula, 120 farmers were selected using stratified random sampling. The instrument employed in this study was a questionnaire with its validity being confirmed by a number of academic experts and agriculture specialists and its reliability being proved using Cronbach's alpha coefficients in a pilot study (outside the scope of the current study). ($0.66 \leq \alpha \leq 0.90$). The results of the analysis regarding the effects of independent variables on the variables "soil conservation behavior" and "soil conservation concern" indicated that, among the variables affecting these two variables, the variable "attitude towards soil conservation "was the most powerful predictor of "soil conservation concerns" and the variable "social pressures on soil conservation" predicted farmers' "soil conservation behaviors" better. Furthermore, the independent variables used in this research could predict 42% of the variance in terms of soil conservation concern and 21% of the variance in terms of soil conservation behavior. These findings can be practical and appropriate for executive officials since, instead of making efforts to direct change the behavior, they can first focus on conceptual changes and persuasive changes like changing attitudes towards soil conservation.

1. Introduction

Over the past few decades, global environment has experienced serious issues and problems such as global warming, air pollution in cities, noise pollution and loss of biological diversity (Hejazi & Eshaghi, 2014; Menatizadeh & Zamani, 2012). On the other hand, environmental challenges are not exclusively limited to developed countries and all countries around the world may be copping with these problems (Salehi & Imam Gholi, 2012). However, individuals' increased quality of life at the expense of exorbitant consumption of environmental resources has negatively impacted the lives of people around the world (Latif, Omar, Bidin, & Awang, 2013) and caused them numerous challenges (such as climate change, deterioration of natural resources, and etc.) (Klöckner, 2013). Undoubtedly, one of the most important problems in the achievement process of environmental sustainability is soil erosion mitigation (Ghazani & Bijani, 2016; Kibblewhite et al., 2014; Noorollah-Noorivandi, Ajili, Chizari, & Bijani, 2009). In fact, land degradation caused by soil erosion and food reduction is a critical issue threatening the development of agriculture sector, food security, national security, and the like (Azizi Khalkhili, Bakhshi Jahromi, & Bijani, 2012). Hence, the strategic importance of soil resources is widely accepted in international fora and soil conservation is considered as a prerequisite to achieve food security and to adopt environmental policies (Kibblewhithe et al., 2014; Bindraban et al., 2012). Evidences suggest that soil resources are at risk of severe damage so that 6–7 million hectares of land are annually degraded because of erosion (Mahboobi & Sepehrara, 2013). In this regard, Iran is a vulnerable country in terms of soil erosion (Agheli-e Kohneshari and Sadeghi, 2005). According to the statistics of Iran's Soil Science Society (2013), Iran's soil erosion is three times as much as Asia's and Iran is ranked one among the developing countries and in the world (Ghazani & Bijani, 2016; Rouhani, 2013).

Due to the critical nature of the subject, the officials, in addition to technical and macroeconomic proposals, have paid attention to social

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aspects of solution-making to protect natural resources (such as soil) (Valizadeh, Bijani, & Abbasi, 2016). On the other hand, land degradation caused by soil erosion and depletion of food is one of the major problems limiting the development of the agriculture sector (Azizi Khalkhili et al., 2012; Ghazani & Bijani, 2016). In Iran, management affairs and conservation of soil resources are mainly affected by two factors (namely natural and/or climatic conditions and management and conservation of soil resources by human activities) (Bayat, Rastegar, & Azizi, 2011). Thus, human beings would cause environmental degradation (Bijani & Hayati, 2015; Steg & Vlek, 2009), including soil degradation, by their behaviors towards the environment and making changes in the environment, resulting in alarming threats (Steg & Vlek, 2009). As a result, systematic investigations of the behavior and the factors affecting its formation (such as environmental concerns, attitudes, and so on) are of paramount importance with regard to soil conservation (Abbasian, Chizari, & Bijani, 2017; Adams, 2014; Aguilar-Luzón, García-Martínez, Calvo-Salguero, & Salinas, 2012; Stern, 2000; Andersson, Shivarajan, & Blau, 2005).

On the other hand, a thorough review of the studies on factors explaining individuals' behaviors towards issues such as soil, water, air, and environment, in general, has provided a wide range of classifications (Valizadeh et al., 2016). In a general classification, however, studies conducted in this field can be divided into two categories: (1) Studies employing a particular theoretical model; and (2) Studies on pro-environmental opinions, concerns, and behaviors that do not utilize a specific theoretical framework (Yazdanpanah, Hayati, & Zamani, 2011). Both categories have widely been of interest in the fields of environmental sociology (Gross & Heinrichs, 2010), human ecology (Tien, 2009), and environmental psychology (Hsu, 2003). Abundant research in the fields of environmental psychology, human ecology, environmental sociology and others resulted in an assumption indicating that "a part of the environmental damage is the consequence of humans' inappropriate behavior towards it". Consequently, to improve the environment, the factors affecting (and shaping) the human behavior should be explained and identified. It should be noted that a lot of studies have examined the factors shaping individuals' behaviors towards the environment and natural resources, i.e. pro-environmental behaviors. For example, Niaura analyzed the factors influencing pro-environmental behaviors of young people, according to the theory of planned behavior and revealed that pro-environmental attitudes affect the pro-environmental behavior. In this study, the analysis also showed that social pressure imposed by friends, family and others has little effect on their pro-environmental behavioral intentions, compared with the perceived behavioral control (Niaura, 2013).

In another study conducted by Karppinen to assess private forest owners' attitude towards reforestation, it was found that attitudes, subjective norms, and perceived behavioral control have a significant impacts on the forest owners' intention to accept natural reforestation. The results of path analysis showed that study variables as a whole and together could predict 39% of the dependent variable variance. The intention was to approach the highest predicting power. In this case, the most powerful predictor of intention was attitude. The findings of correlation analysis also suggested a positive correlation between attitudes towards reforestation and intentions towards reforestation, subjective norms and intentions with reforestation, and the perceived behavioral control and intentions towards reforestation (Karppinen, 2005).

Trumbo and O'Keefe (2005) conducted a study entitled "Intention to conserve water: Environmental values, reasoned action, and information effects across time" to examine attitudes and behaviors towards water conservation by using the theory of reasoned action. This study employed an online survey during 1999–2000 in Nevada, America. The results of correlation analysis for the components of the theory of reasoned action indicated that all relationships predicted in this model were proved. However, the results of the path analysis on the causal effects of the theory variables revealed that the causal relationships predicted in this model were repeated in accordance with the mentioned theory. Evaluating Utah landowners' intentions towards involvement in the improvement of coastal areas, Corbett (2002) came to the conclusion that among the components of the theory of planned behavior, only the effect of subjective norms on water resources was statistically significant. The author's justification is that there is a series of social barriers affecting people's behaviors and they are ignored in the theory of planned behavior. On the other hand, the researcher argues that the theory of planned behavior is of no use in terms of farmers' cooperative behaviors.

Kollmuss and Agyeman (2002), quoting *Fetcao* and Cassel, presented the factors affecting pro-environmental behavior in a framework. In this framework, the factors "awareness the behavioral consequences", "incentives for pro-environmental behavior", " environmental attitudes and values" and "feasibility of pro-environmental measures" directly affect the pro-environmental behavior. In addition, the factor "environmental knowledge" indirectly has an effect on it through influencing the environmental attitudes and values. The researchers analyzed theoretical foundations and models and showed that some factors including personality traits, internal factors (environmental incentive, environmental knowledge, environmental awareness, environmental consciousness, values, attitudes, emotions, preferences, etc.), and external factors (economic, social, cultural and institutional) affect the environmental behavior. In this regard, Price and Leviston (2014) researched the effect of psychological, background, and social factors on land management measures in line with a pro-environmental activity. In this research, the theory of planned behavior and the theory of value-belief-norm were used as the models predicting pro-environment agricultural activities. The findings showed that values, beliefs, and norms are major factors influencing pro-environmental behaviors. In general, farmers' social and psychological background predicts their pro-environment agricultural activities. It was also concluded that attitudes and values interact with feedback mechanisms, motivating farmers to adopt such behaviors.

According to the literature review and inspired by its rationality (where pro-environmental attitudes and social pressures act as individuals' behavioral bases and environmental concern is an important factor in shaping pro-environmental behavior), this study primarily aimed to investigate the below objectives.

1. Investigating the effect of two variables "attitude" and "social pressure" on the variable "soil conservation concern", and
2. Analyzing the effect of the variable "soil conservation concern" on "soil conservation behavior".

These objectives provided the grounds for the realization of the study overall objective, i.e. analysis of the factors affecting farmers' soil conservation behavior in the central district of Sari, Iran. The study conceptual framework is presented in Fig. 1.

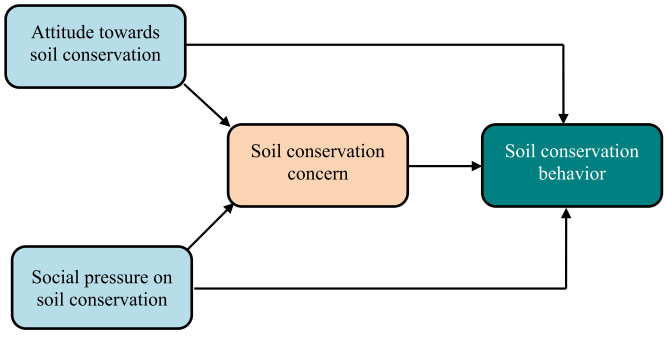

Fig. 1. Conceptual framework of the study.