Understanding Rural People's Engagement in Pro-Environmental Behaviors: An Integrated Conceptual Framework

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ABSTRACT

Undoubtedly, investigation and recognition of individuals' environmental behaviors are key prerequisites to resolve environmental problems, but empirical theory-based research on this topic is limited, particularly in developing countries. Accordingly, a mixed model based on the Theory of Planned Behavior (TPB), and the Norm Activation Model (NAM) was proposed by integrating rational and normative variables to explain Iranian villagers' engagement in Pro-Environmental Behaviors (PEBs). A structured questionnaire was the main research instrument developed based on the combined TPB-NAM. The face validity of the questionnaire was determined by expert review. Additionally, the construct validity (including convergent and divergent validity) and the composite reliability were achieved by Confirmatory Factor Analysis (CFA). Data from a survey of 362 rural household heads of Tabriz County selected through a multistage probability sampling with three stages were used to assess empirically the research model and hypothetical relationships. The results of the Structural Equation Modeling (SEM) revealed that the accuracy and explanatory power of the combined TPB-NAM were superior to those of TPB and NAM. Additionally, Personal Norm (PN) was found to be the most salient predictor of villagers' engagement in PEBs. Overall, the findings of this study contribute to theory building and development of a more comprehensive model in the field of PEB, and yield more insight into socio-psychological factors influencing villagers' engagement in PEBs.

Keywords: Norm activation model, Personal norm, Rural areas, Theory of planned behavior.

INTRODUCTION

In recent years, Iran has been faced with numerous environmental crises and challenges (Tahbaz, 2016). The severity of such problems is multiplied in rural areas given the close linkage between the villages and surrounding environment. In more detail, Iranian environmental crises are very much tied to the villages in the way that these crises appear to be virtually embedded characteristics of rural areas in various provinces (Azmi and Motiee Langroudi, 2011). In the same manner, the evidence shows that environmental problems are more severe in the rural areas of East Azerbaijan Province as a unique region of the country in terms of its environmental aptitude, particularly its ecological value and biodiversity (Oulad, 2018). To make it more clear, one of the most serious environmental crises in this province including Tabriz County is attributed to improper waste disposal, which has caused air and groundwater resources' pollution and wildlife loss. Most importantly, similar to other parts of the country, the farmers in Tabriz County excessively apply chemical pesticides and fertilizers on their farms (Mohammadian Saghinsara, 2018; Rezaei *et*

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al., 2019). Obviously, this behavior not only has caused crop contamination but also has brought about lots of environmental tensions including water, air and soil resources' contamination and plant and animal biodiversity losses. Similarly, another environmental crisis happening in the rural areas of Tabriz County is significant water resources' devastate in the agricultural sector due to traditional irrigation methods' application by a large number of farmers, which in turn has resulted in lowering groundwater levels and drying up of the springs and rivers in different areas (Hosseinzad *et al*., 2013). Finally, soil erosion is presumed as another environmental issue in the rural areas of Tabriz County due to farmers' improper agricultural practices, which have imposed irreparable damages to the environment (Mohammadian Saghinsara, 2018). Under such circumstances, although large-scale industries and agribusinesses are generally involved, rural people and farmers themselves are often being challenged as culpable interferers in environmental destruction process (Sulemana and James, 2014). Therefore, it is essential that the villagers learn how to modify their practices and adopt Pro-Environmental Behaviors (PEBs) (Price and Leviston, 2014).

PEBs can be regarded as behaviors exerting minimal destructive effects on the environment and may help to conserve the environmental resources (Steg and Vlek, 2009). Generally, as Larson *et al*. (2015) elaborated, different people like villagers can engage in three separate types of PEBs. These behaviors include Conservation Lifestyle (CL), Environmental Citizenship (EC), and Social Environmentalism (SE). CL refers to individuals' daily activities influencing environmental sustainability on a large scale. Some of these actions include energy saving, recycling products, and pick up litter (Larson *et al*., 2015; Safa *et al*., 2018). EC or political consciousness can be simply defined as civic engagement in environmental policy efforts, including actions such as donating money for

conservation causes (Larson *et al*., 2015). SE reflects conservation actions whose efficacy is firmly rooted in social relationships and interactions such as participating in a local environmental group or association (Larson *et al*., 2015; Safa *et al*., 2018). It is worth mentioning that due to the close relationship between agriculture and environment, in addition to the three categories mentioned, Wang *et al*. (2014) and Safa *et al*. (2018) emphasize that Agricultural-Environmental (AE) practices can be regarded as another key type of villagers' PEBs. Some examples of these actions are applying conservation agriculture practices, using biological methods to control pests, and using modern farm irrigation systems. Given the importance of PEBs, there is a growing pressure on farmers to consistently adopt PEBs and engage in these behaviors; although much uncertainty still exists about the key drivers of farmers' environmental decisions and behaviors particularly socio-psychological factors in prior studies (Rezaei *et al*., 2019). Accordingly, this research aimed to examine factors affecting villagers' engagement in PEBs in Tabriz County, Iran.

Theoretical Framework and Development of Research Hypotheses

In recent years, numerous theories and models from different academic branches have been presented to understand and predict individuals' PEBs (Valizadeh *et al*., 2019b). In general, these theories can be categorized in two major approaches, including rational human and moral approaches (Valizadeh *et al*., 2019a). Although the rational human approach including theories like the theory of planned behavior (TPB) regards individuals' behavior as a situation of rational choice, the moral approach (i.e., theories, including norm activation model/ NAM), consider it a moral position (Valizadeh *et al*., 2019a). However, since engaging in PEBs stems from individuals' norm-based values and

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beliefs and their self-interest and volitional intentions (Park and Ha, 2014), the two theoretical models are useful in investigating PEBs. Despite this, both models have some shortcomings. TPB pay no attention to the importance of altruistic motives in guiding individuals' behavior (Kaiser *et al*., 1999). Similarly, NAM ignores the role of both volitional and non-volitional processes regarded as key aspects of TPB in shaping behaviors (Han and Hyun, 2017). Under such circumstance, it seems that combining the theories of TPB and NAM can provide a clearer understanding of rural people's decision-making process for engaging in PEBs and help to propose a more accurate model.

Theory of Planned Behavior

According to TPB, intent or readiness to act is the most important driver of behavior. Furthermore, one's attitude toward behavior, Perceived Behavioral Control (PBC), and Subjective Norm (SN) influence intention (Ajzen, 1991). Attitude reflects an individual's pleasant/unpleasant, beneficial/harmful, valuable/worthless, good/bad, and enjoyable/ unenjoyable comprehensive psychological evaluations (Ajzen, 2002). As regard the TPB framework, stronger is the probability of performing the particular behavior in question if the degree of a positive attitude toward an individual's behavior is higher (Verma and Chandra, 2018). In this case, the findings of several empirical studies propose that attitude is an underlying driver of pro-environmental intention and behavior (Liu *et al*., 2017; Shin *et al*., 2018; Rezaei *et al*., 2018; Verma and Chandra, 2018).

PBC is individuals' perception of performing a certain environmental behavior difficultly or easily (Ajzen, 2002). Based on TPB, PBC directly affects both behavioral intention and behavior (Ajzen, 1991). Studies into PEB have also supported the direct impact of PBC on behavioral intention and/or actual behavior (Bamberg *et al*.,

2007; Park and Ha, 2014; Setiawan *et al*., 2014; Safa *et al*., 2018). SN is a social factor defined as the individual's perceived social pressure to shape or not to shape a particular behavior (Ajzen, 1991). TPB considers that if individuals believe that people significantly approve or disapprove their behavior, they are likely to engage in the behavior (Conner and Armitage, 1998). A number of previous studies supported this theoretical hypothesis (Safa *et al*., 2018; Shin *et al*., 2018). Overall, based on the supporting evidence in the literature and standard TPB assumptions, the following hypotheses were presented in this study (Figure 1):

H_1: The attitude toward PEBs significantly and positively affects the engagement in those behaviors.

H_2: The PBC of engaging in PEBs significantly and positively affects the engagement in those behaviors.

H_3: The SN of engaging in PEBs significantly and positively affects the engagement in those behaviors.

Norm Activation Model

NAM (Schwartz, 1977) is one of the most prominent models predicting how and which (normative) factors influence environmental behaviors (van der Werff and Steg, 2015). Personal norm (PN) forms the core of NAM reflecting feelings of moral obligation to perform or refrain from specific actions (Onwezen *et al*., 2013). PN is used in NAM to predict individuals' behavior (Onwezen *et al*., 2013). NAM postulates that PN is determined by two key variables: Awareness of Consequences (AC), and Ascription of Responsibility (AR) (Schwartz, 1977).

Since PEB is often a pro-social behavior (Zhang *et al*., 2017), NAM has been extensively used to investigate different pro-environmental intentions and behaviors, including decision-making on environmentally responsible convention attendance (Han, 2014), intention to visit an environmentally responsible museum (Han
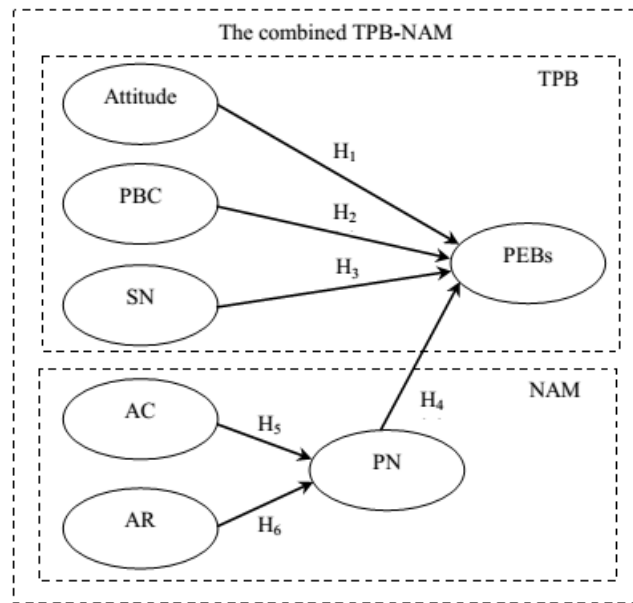
Figure 1. Theoretical research framework (PBC: Perceived Behavioral Control; SN: Subjective Norm; PN: Personal Norm; AC: Awareness of Consequences; AR: Ascription of Responsibility; PEBs: Pro-Environmental Behaviors; TPB: Theory of Planned Behavior, NAM: Norm Activation Model).

and Hyun, 2017), citizens' environmental complaint (Zhang *et al*., 2017), and use of integrated pest management (Rezaei *et al*., 2019). The results of these studies suggest sufficient support for NAM in explaining PEBs. Accordingly, based on the NAM analytical framework, the following hypotheses were developed (Figure 1):

H_4: The PN of engaging in PEBs significantly and positively affects the engagement in those behaviors.

H_5: The AC of engaging in PEBs significantly and positively affects the PN relevant to their engagement.

H_6: The AR of engaging in PEBs significantly and positively affects the PN relevant to their engagement.

Research Model: The Combined TPB-NAM

Based on the previous argument, Figure 1 presents the theoretical research framework and hypothesized relationships.

MATERIALS AND METHODS

The target population for this research involved all heads of households in the rural areas of Tabriz County, East Azerbaijan, Iran (N= 34308). Using the formula proposed by Bartlett *et al*. (2001), the required sample size for this study was determined to be 380 villagers:

$$n = \frac{\dfrac{Z_{\frac{\alpha}{2}}^2 pq}{d^2}}{1 + \dfrac{1}{N}\left[\dfrac{Z_{\frac{\alpha}{2}}^2 pq}{d^2} - 1\right]}$$

Where, N= Size of population (34,308 villagers), n= Required sample size, z= Confidence level at 95% (z= 1.96), d= Margin of error at 5% (standard value of 0.05), p= Proportion in the target population (p= 0.5), and q= (1−p) (i.e., q= 0.5). Given the distribution of households' heads in different rural districts of Tabriz County and the representativeness of the sample, a 3-stage multistage sampling design was used to select the surveyed respondents. To this end, at the first stage, out of the six rural districts of the county, including Lahijan and Tazeh Kand (in Khosrowshah District) as well as Aji Chay, Esperan, Meydan Chay, and Sard-e Sahra (in the central district), three rural districts were chosen randomly.

These rural districts were Lahijan, Aji Chay, and Meydan Chay. Collectively, the selected rural districts consisted of 38 villages, of which 21 villages i.e., 5 villages in Lahijan, 5 villages in Aji Chay, and 11 villages in Meydan Chay, were considered to obtain the samples. Then, a random sample was taken with a proportional number of stratum size (i.e., village) as compared to the target population. The study data were collected through personal interviews with rural settlements, using a questionnaire survey administered from April 2018 to June 2018. The research recorded a 95.3% response rate, with 362 completed questionnaires successfully collected out of the 380 questionnaires distributed.

The questionnaire was composed of three distinct sections. The first part included a request for the villagers' demographic details. The second part consisted of 25 items quantifying six constructs/latent variables of the combined TPB-NAM, including SN (4 items), PBC (5 items), attitude (4 items), AR (4 items), AC (5 items), and PN (3 items). Table 2 presents all of these items. Respondents were asked to provide a self-assessment on the items using a 5-point Likert scale with endpoints of 'strongly disagree' and 'strongly agree'. In the third section of the questionnaire, the respondents were asked to rate how frequently they engaged in various PEBs. The variable of engagement in PEBs as a dependent variable of the research consisted of four components: SE, CL, EC, and AE practices. In particular, the SE category was measured with three items of "talking to or educating others about environmental issues", "participating in a local environmental group or associations", and "collaborating with others to consider environmental issues". Similarly, six items were selected to measure the CL category, including "energy saving", "use of renewable energies", "saving water at home", "recycling or reusing products", "minimizing or picking up litter", and "use of sustainable transport modes such as walking and cycling". Accordingly, the four

items of "donating money for conservation causes", "petitioning about environmental issues", "voluntary membership in the Hamyar‑Tabiat Project", and "participation in environmental activities and programs (such as tree planting, environmental clean-up programs, and public campaign for environmental protection)" were employed to evaluate the EC category. Finally, the AE practices category was measured with five items of "using biological methods to control pests", "using modern farm irrigation systems", "planting drought resistant varieties", "using conservation agriculture practices i.e., zero or minimum tillage, direct seeding and varied crop rotation", and "applying green and animal fertilizers". The scale for measuring these behaviours was a six-point continuum from zero to five as "Not at all = 0, Very low = 1, Low= 2, Medium= 3, High= 4 and Very high= 5". It is significant to note that, given the relatively large number of items in each component of PEBs, parceling was employed to reduce item numbers and simplify the model.

The Covariance-Based Structural Equation Modelling (CB-SEM) approach, using the maximum likelihood procedure with the aid of the AMOS software version 22.0, was adopted to test the hypothetical model (Rezaei *et al*., 2017; Rezaei and Mianaji, 2019). Although SEM is an extension of regression, it has been strongly recommended to use in the social sciences for the following reasons, including use of latent constructs with multiple indicators, testing models overall vs. individual coefficients, applying Confirmatory Factor Analysis (CFA) to decrease measurement errors, and simultaneous testing of various relationships (Richter *et al*., 2016). To evaluate the research model, the two-stage model building process was adopted in this study. First-order CFA with all the items in the model was initially performed to assess the model fit, composite reliability, discriminant validity, and convergent validity in order to ensure effectiveness and quality of the measurement model. Then, the

structural model was evaluated to test the hypotheses proposed in the research model (Hair *et al*., 2010).

RESULTS

Description of the Sample

Among the 362 respondents, there were 89.2% males and 10.8% females. Mean age of the surveyed villagers was 38.6 years (Table 1). As to marital status, most of the villagers (76.1%) were married. A majority of the rural people were high school graduates (30.3%) and few number of them were illiterate (8.2%). The distribution of occupation showed that the main job of most of the villagers was agriculture, representing 65.3% of the sample (Table 1). The average family size was 4.8 people.

Assessment of Measurement Model

Tables 2 and 3 show the results of the first-order CFA. The Chi-square statistic was statistically significant and the values computed for other indices showed that the

Table 1. Demographic characteristics of the surveyed villagers (n= 362).

Variable	Frequency (%)/Mean
- Sex	-
Male	89.2
Female	10.8
- Age (years)	38.6
- Martial status (%)	-
Single	23.9
Married	76.1
- Education (%)	-
Illiterate	8.2
Elementary school	20.8
Intermediate school	23.6
High school	30.3
Academic degree	17.1
- Main occupation (%)	-
Non-agriculture	34.7
Agriculture	65.3
- Family's average size	4.8

model yielded a good model fit to the data (Table 2). As Table 2 presents, the standardized loading factors of all items were above 0.5 (range from 0.572 to 0.901) and statistically significant at P<0.001.

As shown in Table 3, the values of average variance extracted/ AVE (range from 0.536 to 0.599) and Composite Reliability (CR) (ranging from 0.781 to 0.873) all exceeded the recommended threshold of 0.5 and 0.7, respectively. Hence, convergent validity and CR were validated. The values of Average shared Squared Variance (ASV) and Maximum shared Squared Variance (MSV) were less than those of AVE, and the square root of AVEs was higher than inter-construct correlations, yielding support for discriminant validity (Table 3).

Assessment of Structural Model

As can be seen in Figure 2, similar to the full measurement model, the structural model fitted the data adequately, with all indices being within acceptable ranges. This demonstrates the appropriate efficiency of utilizing the combined TPB-NAM in predicting villagers' engagement in PEBs. Moreover, Squared Multiple Correlations (SMC; R^2) computed for the PEBs were equal to 68.4% (Figure 2). This implies that the independent variables in the combined TPB-NAM can explain 68.4% of variance in the PEBs.

DISCUSSION

The results of this study indicated that the variable PN was the most important determinant of rural people's engagement in PEBs. This finding is in line with the results obtained by Han (2014), Han and Hyun (2017), Zhang *et al*. (2017), and Rezaei *et al*. (2019), while other previous researches indicated that PBC (Bamberg *et al*., 2007; Park and Ha, 2014; Setiawan *et al*., 2014) and attitude (Liu *et al*., 2017; Shin *et al*., 2018; Rezaei *et al*., 2018) were highly influential. One possible reason for the strong influence of PN compared to other

Table 2. Results of the first-order CFA.

Items and constructs (Source)	Std loading	t-Value
- Attitude (Park and Ha, 2014; Rezaei *et al*., 2019)		
For me, to engage in PEB is beneficial/Harmful (Att_1).	0.799	fixed
For me, to engage in PEB is pleasant/Unpleasant (Att_2).	0.848	14.298
For me, to engage in PEB is good/Bad (Att_3).	0.713	11.814
For me, to engage in PEB is valuable (useful)/Worthless (Att_4).	0.728	12.089
- PBC (Ajzen, 2002; Zhang *et al*., 2017)		
The decision to engage in PEBs is under my control (PBC_1).	0.724	fixed
Whether I engage in PEBs is entirely up to me (PBC_2).	0.901	13.765
I have enough opportunities, time, and resources to engage in PEBs (PBC_3).	0.851	13.203
I am confident in engaging in PEBs if I want to (PBC_4).	0.572	8.789
I have the knowledge, skills and experience necessary to engage in PEBs (PBC_5).	0.709	10.941
- SN (Ajzen, 2002; Park and Ha, 2014)		
Important people to me think that I should engage in PEBs (SN_1).	0.783	fixed
I am expected to engage in PEBs (SN_2).	0.750	9.697
People with valued opinions approve engaging in PEBs (SN_3).	0.689	9.141
I feel like being under social pressure to engage in PEBs (SN_4).	0.770	10.057
- PN (Onwezen *et al*., 2013; Park and Ha, 2014)		
I feel morally obligated to engage in PEBs (PN_1).	0.697	fixed
I would feel guilty about not engaging in PEBs (PN_2).	0.847	11.858
Engagement in PEBs is consistent with my moral beliefs, values, and principles (PN_3).	0.661	7.768
- AC (Onwezen *et al*., 2013; Zhang *et al*., 2017)		
The balance in nature is delicate and easily upset (AC_1).	0.844	fixed
Performing PEBs can help to improve the individuals' quality of life for contemporary and future generations (AC_2).	0.822	16.156
Performing PEBs will create a better world for me and my family (AC_3).	0.766	14.081
Not Performing PEBs and creating environmental problems directly affect my health (AC_4).	0.622	10.752
If we do not perform PEBs, thousands of species will become extinct over the next several decades (AC_5).	0.742	13.182
- AR (Setiawan *et al*., 2014; Rezaei *et al*., 2019)		
I feel responsible for the problems resulting from not performing PEBs (AR_1).	0.821	fixed
I believe that all villagers are jointly responsible for the problems potentially caused by not performing PEBs (AR_2).	0.857	14.019
The government bears the most responsibility for protecting the natural resources and the environment (AR_3).	0.675	11.063
Performing PEBs is not only the responsibility of other villagers, but me too (AR_4).	0.689	11.335
- PEBs (Wang *et al*., 2014; Larson *et al*., 2015; Safa *et al*., 2018)		
Social Environmentalism (SE)	.684	fixed
Conservation Lifestyle (CL)	.622	8.452
Environmental Citizenship (EC)	.841	11.902
Agricultural-Environmental (AE) practices	.762	10.134
Fit indices of the full measurement model: *Chi*-square (df)= 702.458 (353); P-value= 0.000; Relative *Chi*-square= 1.990; IFI= 0.909; CFI= 0.907; RMR= 0.058; RMSEA= 0.062; AGFI= 0.815, GFI= 0.850.		

variables in this study may be that Iranian villagers, including Tabriz County, always have a friendly and close relationship with the environment and strong religious beliefs regarding the environment value (Rezaei and Ghofranfarid, 2018). In other words, they have a strong feeling of moral obligation to engage in PEBs and, consequently, they may be more engaged in ecofriendly responsible behaviors. In fact, in the case of pro-social behaviors like PEBs, PN is a significant predictor of behavior (Schwartz, 1977; Stern *et al*., 1995).

Table 3. Validity and reliability of constructs. [a]

Constructs	Validity and reliability					Correlation matrix					
	AVE	CR	MSV	ASV	PEBs	Attitude	PBC	SN	PN	AC	AR
1. PEBs	0.536	0.820	0.462	0.336	**0.732**						
2. Attitude	0.599	0.856	0.445	0.252	0.667	**0.774**					
3. PBC	0.578	0.870	0.131	0.091	0.362	0.331	**0.760**				
4. SN	0.561	0.836	0.323	0.145	0.568	0.509	0.200	**0.749**			
5. PN	0.547	0.781	0.315	0.171	0.561	0.458	0.189	0.344	**0.740**		
6. AC	0.582	0.873	0.462	0.229	0.680	0.502	0.347	0.252	0.444	**0.762**	
7. AR	0.585	0.848	0.340	0.194	0.583	0.489	0.330	0.242	0.384	0.522	**0.765**

[a] Note: In bold, diagonal figures are the square root of AVE values.

Consistent with most prior studies, which have employed the combined TPB-NAM to predict different behaviors (e.g. Han, 2014; Park and Ha, 2014; Setiawan *et al*., 2014; Liu *et al*., 2017; Han and Hyun, 2017; Rezaei *et al*., 2019), the variable of SN had weaker effect on rural people's engagement in PEBs than that of the variable PN. However, very few empirical studies have reported inconsistent results, suggesting stronger impact of SN on PEBs (Shin *et al*., 2018). This finding implies that villagers' engagement in PEBs is notably steered by their personal value system than expectations of significant others. This can be primarily attributed to the nature of PEBs. In other words, since non-engagement of rural people in PEBs can result in detrimental consequences for society, they feel personally responsible for acting PEBs and, consequently, they are more likely to create feelings of obligations caused by internal norms (Schwartz, 1977). Furthermore, as Venkatesh *et al*. (2003) emphasize, the role of SN may has eroded over time and has gradually become weaker, since participating in environmental conservation and performing the related actions are not a very new issue in the rural areas of Tabriz County (Mohammadian Saghinsara, 2018).

The findings of the present study revealed that the variable of attitude had weaker effect on the villagers' engagement in PEBs than normative variables, particularly PN. This is somewhat surprising given that numerous studies have indicated that attitude is often the main driver of individuals' intentions/behaviors (e.g. Liu *et al*., 2017; Shin *et al*., 2018; Rezaei *et al*., 2018; Verma and Chandra, 2018). In this regard, Pannell *et al*. (2006) argue that attitude plays a key role in shaping behaviors that enable farmers to meet their personal goals. However, PEB is a collectivistic behavior (Bamberg *et al*., 2007) in which public interest/pro-social motives outweigh the self-interest preferences. Therefore, according to the nature of PEBs, it is justifiable that PN has a stronger impact on engagement in PEBs than attitude.

According to the results of this study, PBC was found to be the weakest predictors of rural people's engagement in PEBs, compared to other variables in the combined TPB-NAM. This finding is in line with the results obtained by Bamberg *et al*. (2007), Park and Ha (2014), and Setiawan *et al*. (2014), but it is not congruent with those obtained by Han (2014), Liu *et al*. (2017), Han and Hyun (2017), Zhang *et al*. (2017), Shin *et al*. (2018), and Rezaei *et al*. (2019). A possible explanation for the low influence of PBC on the villagers' engagement in PEBs might be that most of the surveyed respondents in Tabriz County have low
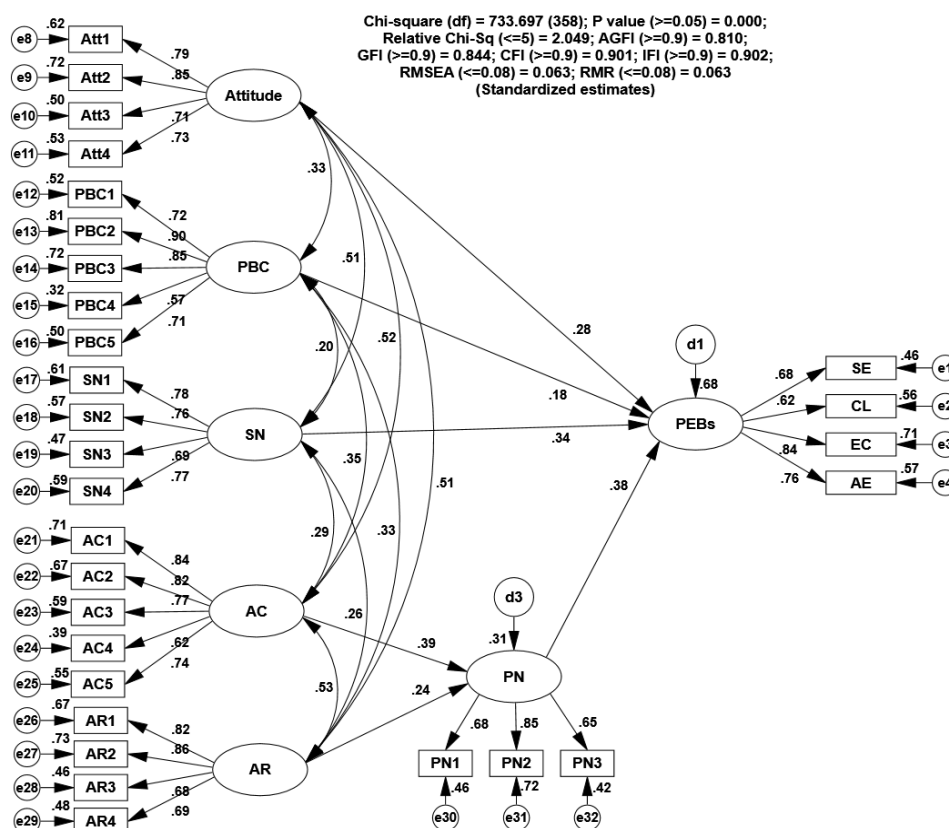
Figure 2. The structural model with standardized path coefficients and explained variances.

Table 4. Hypothesis testing results.

Path and hypotheses	Unstandardized estimate	Standard error	Standardized estimate	t-Value	P-value significance	Result
Attitude→PEBs (H$_1$)	0.233	0.066	0.284	3.530	0.001	Supported
PBC→ PEBs (H$_2$)	0.185	0.076	0.181	2.434	0.014	Supported
SN→ PEBs (H$_3$)	0.327	0.082	0.342	3.988	0.001	supported
PN→ PEBs (H$_4$)	0.310	0.068	0.379	4.559	0.001	Supported
AC→PN (H$_5$)	0.515	0.120	0.392	4.292	0.001	Supported
AR→ PN (H$_6$)	0.273	0.104	0.237	2.625	0.008	Supported

literacy levels and do not have enough skills, abilities, and knowledge on environmental issues. In other words, the rural people have low self-efficacy for performing PEBs, and as a result, they may not have enough self-confidence for engagement in their behaviors. Additionally, although engaging in different types of PEBs often raises individual costs, the majority of the surveyed villagers have a relatively weak financial capability (Mohammadian Saghinsara, 2018). This, in turn, significantly limits the villagers' controllability to perform ecofriendly practices. Collectively, although the variable of PBC significantly and positively affected the rural people's engagement in PEBs, the low levels of self-efficacy and controllability as two main components of PBC caused this variable to have the weakest effect on the villagers' engagement in PEBs compared to the other variables in the research model.

CONCLUTIONS

A review of various studies reveals that the original constructs in the TPB and the variables rooted in NAM explain approximately 39 and 42% of the variance in intention/behavior, respectively (Armitage and Conner, 2001; Han and Hyun, 2017). However, the results of our study showed that the components of the combined TPB-NAM accounted for 68.4% of the variance in PEBs. This provides the support for the assertion that integrating relevant components from the two models improves the predictive power of the proposed framework and yields more insights into determinants of the rural people's engagement in PEBs. Moreover, the results of the study indicated that pro-social motives (i.e., moral/personal norms) were the more dominant factors influencing the engagement in PEBs over self-interest motives, including SN, attitude, and PBC. Finally, the key policy implications that emerge from this study include recognizing and highlighting PEB as a powerful moral norm among the rural people; improving villagers' awareness of consequences of their non-environmental behaviors; and offering stronger opportunities, acknowledgements, and incentives for rural settlements to control individual and community ecological behaviors.

The present study has some major limitations paving the way for future research work. First, the combined TPB-NAM predicted 68.4% of the variance of the villagers' engagement in PEBs, indicating that other constructs such as environmental concerns and values (Bhuian and Sharma, 2017), environmental knowledge (Wang *et al*., 2014; Bhuian and Sharma, 2017), and environmental responsibility and sensitivity (Wang *et al*., 2014) may affect PEBs. These other constructs could be included in the theoretical model of this study to increase the model robustness and explanatory power. Secondly, variables related to the villagers' socio-demographic characteristics were not included in the research model; hence, future work can investigate the impacts of these variables on rural people's engagement in PEBs. Lastly, since this study was comprised only of rural settlements in one county in Iran, one major limitation of the study was the limited geographical coverage. In this regard, the study results could not be generalized to all villagers of the country. Thus, further research will need to involve more participants in different provinces of the country.

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درک مشارکت روستاییان در رفتارهای حفاظت زیست‌محیطی: ارائه یک چارچوب مفهومی تلفیقی

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چکیده

بدون تردید، واکاوی و شناخت رفتارهای زیست‌محیطی افراد یک پیش‌شرط کلیدی برای رفع مسائل زیست‌محیطی به شمار می‌رود، ولی پژوهش‌های نظریه‌محور بسیار محدودی در این زمینه به‌ویژه در کشورهای در حال توسعه به طور تجربی انجام گرفته است. بر این اساس، یک مدل تلفیقی بر مبنای نظریه رفتار برنامه‌ریزی شده (TPB) و مدل فعال‌سازی هنجار (NAM) از طریق ترکیب متغیرهای هنجاری و منطقی در راستای تبیین مشارکت روستاییان ایرانی در رفتارهای حفاظت زیست‌محیطی پیشنهاد شد. یک پرسشنامه ساختارمند توسعه یافته بر مبنای مدل تلفیق یافته TPB-NAM ابزار اصلی تحقیق بود. روایی صوری پرسشنامه با بررسی متخصصان تعیین شد. افزون بر این، روایی سازه (شامل روایی همگرا و تشخیصی) و پایایی ترکیبی پرسشنامه با تحلیل عاملی تأییدی به دست آمدند. داده‌ها از

طریق یک مطالعه پیمایشی از ۳۶۲ نفر از سرپرستان خانوار روستایی در شهرستان تبریز با استفاده از روش نمونه‌گیری احتمالی چندمرحله‌ای با سه مرحله به منظور ارزیابی تجربی مدل تحقیق و روابط فرضیه‌ای گردآوری گردید. نتایج مدل‌سازی معادلات ساختاری نشان داد که دقت و قدرت اکتشافی مدل تلفیق یافته TPB-NAM بیشتر از مدل‌های TPB و NAM بود. افزون بر این، هنجار اخلاقی اصلی‌ترین متغیر پیش‌بینی کننده مشارکت روستاییان در رفتارهای حفاظت زیست‌محیطی بود. به طور کلی، یافته‌های این پژوهش به ایجاد نظریه و توسعه یک مدل جامع در زمینه رفتارهای حفاظت زیست-محیطی کمک کرده و بینش بیشتری در خصوص عوامل اجتماعی- روان‌شناختی مؤثر بر مشارکت روستاییان در رفتارهای حفاظت زیست‌محیطی ارائه داد.

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