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Conceptualization of Farmers' Water Conservation Intention and Behavior through the Lens of Economic Man Worldview: Application of Structural Equation Modeling

Naser Valizadeh [1,*], Masoud Bijani [2,*], Negin Fallah Haghighi [3], Dariush Hayati [1], Khadijeh Bazrafkan [1] and Hossein Azadi [4]

[1] Department of Agricultural Extension and Education, School of Agriculture, Shiraz University, Shiraz 7144165186, Iran; hayati@shirazu.ac.ir (D.H.); khbazrafkan@yahoo.com (K.B.)
[2] Department of Agricultural Extension and Education, College of Agriculture, Tarbiat Modares University (TMU), Tehran 1497713111, Iran
[3] Department of Technology Development Studies (DTDS), Iranian Research Organization for Science and Technology (IROST), Tehran 7144165186, Iran; nfallah@irost.ir
[4] Department of Economics and Rural Development, Gembloux Agro-Bio Tech, University of Liège, 5030 Gembloux, Belgium; hossein.azadi@uliege.be
* Correspondence: n.valizadeh@shirazu.ac.ir (N.V.); mbijani@modares.ac.ir (M.B.); Tel.: +98-(0)71-32286300 (N.V.); +98-(0)21-48292020 (M.B.); Fax: +98-(0)71-32286072 (N.V.); +98-(0)21-48202200 (M.B.)

Abstract: Although different worldviews have been presented to analyze the conservation behaviors of farmers, limited empirical evidence exists for the use of the economic man worldview to analyze farmers' water conservation behaviors (WCBs). Therefore, the conceptualization of farmers' water conservation behavioral intentions through the lens of this worldview was the primary objective of this survey. To this aim, the extended planned behavior theory (PBT), which is the main theory of the economic man worldview, was employed. The study population was 36183 Iranian farmers, 380 of whom were interviewed in-person in the form a cross-sectional survey research design. An estimation of sample size was performed via the Krejcie and Morgan Table. Moreover, the distribution of the sample size was carried out by a multi-stage random sampling method. Validity and reliability, which are undeniable features of questionnaires in social and psychological sciences, were examined using different quantitative and qualitative indices. The obtained results indicated that the effect of intention towards water conservation (IWC) on WCB was positive and significant. Therefore, this research supports the main assumption of the PBT and the economic man worldview. However, according to the results, the power of IWC's effect on WCB is not very significant. In addition, the variance explanation of WCB as the fundamental dependent variable is not very high. It can be mentioned that the economic man worldview has a relative and moderate power to analyze the WCBs of farmers. Hence, it is suggested that some variables, including moral norms, environmental concerns, and environmental values, are used to develop and increase the explanatory power of the PBT in future studies. This study is the first study of the applicability of the economic man approach in analyzing farmers' WCBs. It could be used to open a new research window for future and interested researchers to conduct successful interventions in the field of water conservation.

Keywords: water conservation; rational choice; behavioral economics; water management; farmers' decision making

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1. Introduction

Climate change and anthropogenic changes in the environment around the globe have created a fundamental challenge to achieving sustainability in the agricultural sector [1,2]. Climate change shows its effects mainly via pressure on water resources [2]. In Iran, there has never been enough water, as the annual rainfall in Iran is 250 mm, and it is expected that this value will decrease in the future [3]. Recent droughts, which mainly originate from growing demand and population growth, have resulted in severe water shortages in different regions of Iran. It should also be mentioned that agricultural development is another factor that has led to efforts to challenge the sustainability of the agricultural sector [4]. However, water overuse and water shortage crises in agricultural communities manifest in terms of economic and social dimensions [2,5]. This issue has become a serious problem, especially in Iran, where more than three-quarters of its fresh water is dedicated to agriculture [6]. Therefore, the role of farmers and farming communities is increasing. In other words, they are at the center of political efforts to protect water and increase its efficiency [3]. To highlight the importance of the issue of farmers' water conservation behaviors (WCBs), the Ministry of Energy of Iran in 2014 announced that the largest loss of agricultural water is related to farmers not employing optimized water consumption systems. The report of this organization emphasizes that farmers who use these systems also have a very high average consumption level compared to the forecasted consumption level. In addition to this problem, one of the most important factors encouraging the irresponsible behavior of farmers in using agricultural water is the low price of agricultural water [7].

As Iran's agricultural sector is mainly traditional, farmers usually attempt to maximize their yield by making the most out of their resources, such as water. It seems that research on the WCBs of farmers can contribute to the resolution of the water scarcity problem. In reference to this problem, Ajzen (1991) [8] enhanced the foundations of a rational approach to pro-environmental behaviors such as WCB. Using this approach to explain farmers' WCBs has revealed that farmers do not intend to sacrifice collective goals (e.g., reducing water consumption and conserving oil resources) in favor of their individual goals, such as when they increase their production and overuse pesticides, but that their behaviors can be explained by the fact that their field is usually their only source of income. In this situation, their water consumption behavior can lead to water resource exploitation. Thus, in this study, the analysis and conceptualization of the WCBs of Iranian farmers were conducted through the lens of the economic or rational man worldview.

Different types of behavior can be identified in the field of environmental behaviors, focusing on the analysis of the effects of man's behaviors on the environment. For example, Bijani et al. [9], Stern [10], Kaiser [11], and Nigbur et al. [12] have investigated water conflict behaviors, environmentally significant behaviors, ecological behaviors, WCBs, and recycling behaviors, respectively. Selecting a suitable behavior with a meaningful and positive impact on the environment is considered to be one of the first steps in analyzing and developing behavioral and social changes [13]. However, the important point in studying environmental behaviors is the worldview that is used to explain the behaviors. In other words, explaining the differences between different worldviews towards environmental behaviors might be useful in recognizing and prioritizing the behaviors with a positive impact on the environment.

In general, there are two major worldviews on environmental behaviors (such as WCBs), including the traditional economics or economic man worldview and the moral worldview or moral man [14]. Each of these worldviews has its own followers striving to prove the validity of their worldview and associated theories with logical reasons. In the moral worldview, a moral choice situation is a situation in which the actions of individuals lead to the comfort and welfare of other farmers. In a moral choice situation, individual members of a community such as farmers are aware that other people's health depends on their actions [15]. These people feel responsible for their actions and their actions' consequences [16]. Based on this worldview, WCBs are a particular kind of moral choice situation. Based on this, it is assumed that a farmer's action can have benefits for his or her community. Further, each farmer's behavior can benefit the agricultural environment [13]. Such behaviors have the ability to benefit other farmers since the farmers follow collective goals through these behaviors. Further, such behaviors can contribute to the mitigation of environmental damages to surface and underground water resources. In regards to ethical choices in the field of water protection, farmer's attitudes and behaviors no longer originate from considerations based on financial benefit. On the contrary, these behaviors and attitudes are more derived from their moral beliefs about the rightness or wrongness of their actions in terms of water protection. In environmental psychology, moral norms are regarded as one of the roots of evaluating pro-environmental behaviors (in terms of rightness or wrongness) [17]. In this worldview, farmers' choices and decisions rely on "feelings of moral obligation". One of the most important behavioral theories in this field is norm activation theory (NAT). However, it should be mentioned that NAT's extended form, which is called the value-belief-norm (VBN) theory, is of great popularity among environmental psychologists.

On the other hand, the water conservation behavior of farmers may be analyzed from an economic worldview, which in some cases is called a rational worldview. In this worldview, the WCB of farmers is regarded as a "rational choice situation". In other words, farmers evaluate the benefits and negative consequences of water conservation and make choices that have the greatest personal benefits for them [18]. In the economic man worldview, an economic or rational person refers to a person (farmer) whose behavior relies on some internal or inner motivators resulting from his or her perceptions. These perceptions are mainly about the consequences of his/her behavior. To put it in another way, in this profit-oriented worldview, "rationality" represents an "economic man [3,19]." This worldview is based on the fact that an economic and rational farmer has the ability and knowledge required to tackle a problem such as water scarcity. Additionally, these farmers have fixed preferences in the field of water conservation. Based on this worldview, farmers' preferences, besides being fixed, also have the characteristic of being organized. Economic farmers have the cognitive potential to choose a set of WCBs. These capabilities of an economic man can help farmers best achieve favorable results [19,20]. Based on the assumptions of the economic worldview, the cost/benefit analysis used by farmers is not only limited to money and financial resources. In other words, the level of effort and social acceptability, which are factors to satisfy the internal needs of farmers, are also important considerations for their involvement in water protection activities. The economic man worldview relies on the important hypothesis that "farmers finally behave rationally". This is because of the fact that farmers use the information available rationally. Therefore, they are not controlled by unconscious motives or super-instinctual desires [21]. The most important behavioral theories in this field include reasoned action theory (RAT) and planned behavior theory (PBT). Based on the fact that the fundamental objective of this study was the conceptualization of farmers' water conservation behavioral intentions through the lens of the economic man worldview, the TPB theory (as the most important theory of the economic man worldview) was employed as the basis of our theoretical framework.

In this theory, the intention to perform a behavior is considered to be a predictor of the actual behavior of people. Based on this fact, WCB was selected as the main dependent variable of the present study. Intention towards water conservation (IWC) emphasizes the extent to which farmers are willing to use water conservation techniques and methods in the future. In other words, IWC is a future-based psychological construct that emphasizes people's future behavior. With reference to the PBT, intention is predicted using three variables: attitude towards water conservation (AWC), subjective norms of water conservation (SNWC), and perceived behavioral control over water conservation (PBCWC) [4]. In other words, one's intention mediates the relationship between these three variables and one's behavior. Nevertheless, in the PBT, it is assumed that PBCWC directly affects WCB in addition to its indirect effect on WCB. In general, attitude refers to any expression of opinion about an object, a person, or an event that involves judgment and evaluation [8]. In other words, AWC refers to farmers' positive or negative judgment about the concept of water conservation and water protection methods. SNWC can be considered social pressures to employ water conservation methods; include the perceived expectations of other farmers, relatives, and acquaintances; and determine how much a farmer values these expectations [3,4,20]. PBCWC is the degree of a farmer's ability to use water conservation methods [20]. Thus, it includes internal factors, such as self-efficacy, and external factors, such as time, resources, etc. There is great support for the direct relationship between attitude and behavior (see [12,16]). Therefore, this path was added to the TPB theory. Finally, the theoretical framework of our research is articulated in Figure 1.

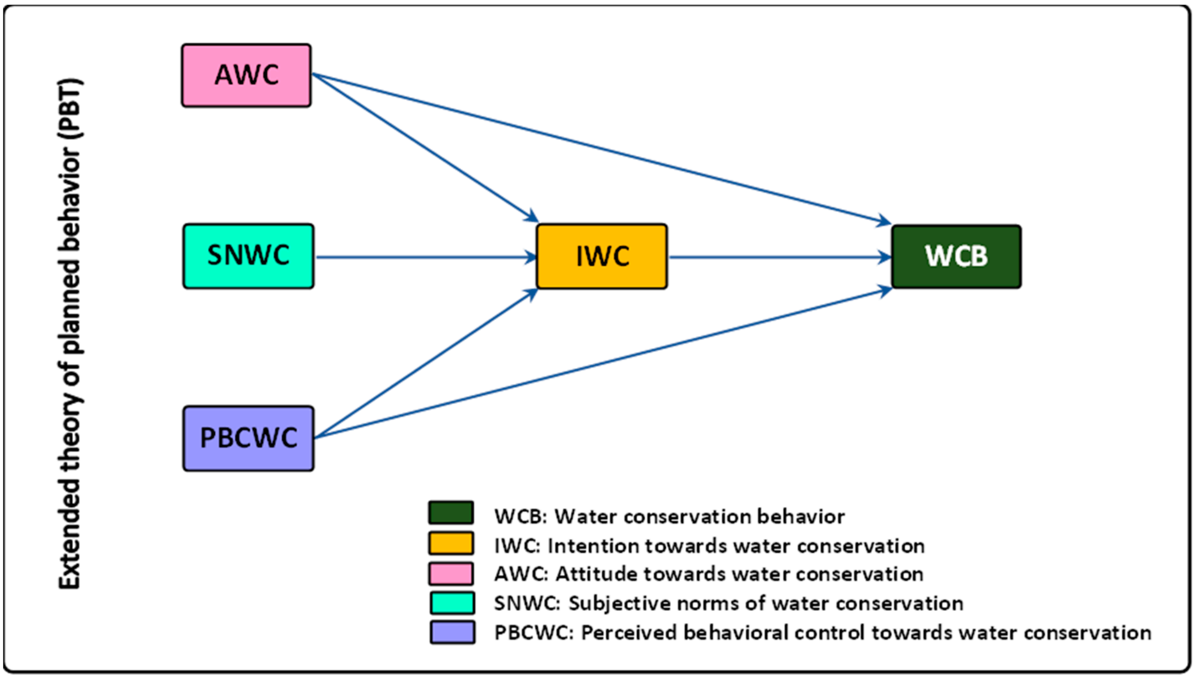

Figure 1. Basic conceptual framework of the study according to extended planned behavior theory (PBT).

2. Materials and Methods

2.1. Research Design

The present study is applied research in terms of its purpose because the results of this study can be used by policymakers, farmers, rural sociologists, rural psychologists, agricultural and environmental researchers, rural and agricultural development practitioners, and environmental management.

2.2. Study Area

The studied area was Mahabad and Miandoab. According to the geographical divisions of Iran, Mahabad and Miandoab are considered as different counties. These counties are located in West Azarbaijan, which is one of the northwestern provinces of Iran. West Azarbaijan Province is one of the most agriculturally intensive provinces of Iran, where plenty of agricultural products are cultivated due to its fertile soil. Wheat, barley, corn, sugar beets, apples, plums, peaches, cherries, cucumbers, tomatoes, etc. are among the most significant agricultural products grown in West Azarbaijan. Most of the villagers of this province are engaged in agriculture, and agricultural-based activities are their main source of income.

2.3. Population, Sampling, and Research Instrument

The study population included 36,183 farmers of West Azerbaijan Province (Figure 2) in Miandoab (26,403 farmers) and Mahabad (9780) [22]. The Krejcie and Morgan [23] Table was the main basis for estimating sample number. Therefore, the size of the sample recommended by Krejcie and Morgan was 380. In order to ensure randomness and representativeness, a multi-stage stratified sampling approach was applied. When a sufficient sample size of the target population was estimated, the selected sample was divided between Miandab and Mahabad counties. The division of the samples among counties was performed in proportion to the size. A closed-ended and structured questionnaire was designed to collect the data. The validity of device was verified using the opinions and comments of a group of experts. In other words, these experts performed a detailed examination of the questionnaire to determine whether the items in question measured the main constructs of the research or not. In order to evaluate the reliability of the questionnaire, a pilot study was conducted outside of Miandoab and Mahabad counties. This study was conducted in Naghadeh city. The results of this study were used to calculate Cronbach's alpha coefficients for the variables that were measured on a Likert-type scale. The Cronbach's alpha coefficients measure the internal consistency of the questionnaires. Cronbach's alpha is obtained based on the average covariance (or correlation) of the questions in a questionnaire and in its evaluation; positive values above 0.7 are considered acceptable. If it is negative, this indicates high heterogeneity (inconsistency). This coefficient refers to the ability of a tool to continuously measure a construct. In other words, it refers to the extent to which all the components of a scale express the same concept and shows the internal relationship of these components. The results of pilot test showed that the reliability of the questionnaire is acceptable (Table 1). After performing main field research, 350 questionnaires were completed. The authors ruled out 15 questionnaires since there were many missing data in these questionnaires. Finally, the answers of 335 respondents were analyzed. Composite reliability (CR) coefficients are another index that is used along with Cronbach's alpha coefficients in social and behavioral sciences for evaluating the internal consistency of questionnaires. The ratio of this index should be greater than or equal to 0.7, which is considered an acceptable value in questionnaires and standard tools. Average variance extracted (AVE) index was used to measure convergent validity. Researchers have set a value of 0.5 and above for the appropriateness of this index. The AVE index shows what percentage of the variance of the studied construct was influenced by the measures of that construct. Discriminant validity is an index that shows how much the items of different factors really differ from each other. In a questionnaire, several questions are asked to measure different factors, so it is necessary to clarify that these questions are different from each other and do not overlap. Generally, two indices, maximum shared variance (MSV) and the average shared squared variance (ASV) are used to evaluate divergent validity. In other words, MSV and ASV show how different the questions of one construct are from the questions of other constructs. These indices are of the main criteria for fitting social and behavioral science models. If the values of these two indices are lower than AVE, it can be concluded that the questions of one construct are different from other questions. Otherwise, the phenomenon of co-linearity occurs.

Table 1. The items used to measure the main constructs and Cronbach's alpha values.

Var.	No.	Items	Source
	Attitude towards water conservation (AWC): (α = 0.73)		
AWC	1	I think that being engaged in water protection measures is desirable.	Self-developed
	2	Perceiving water conservation as a wise action.	
	3	The usefulness of engagement in water conservation.	
	4	Prioritizing product increase over water conservation.	
	5	Necessity of saving water consumption only under water scarcity conditions.	
	6	Holding the idea that water conservation is moral.	
	Subjective norms of water conservation (SNWC): (α = 0.79)		
SNWC	1	My family members, acquaintances, and friends in the village believe that I must be engaged in water protection activities.	[4]
	2	Commitment to water conservation leads to being approved by my friends and acquaintances.	
	3	I think that my acquaintances and relatives in the village expect me to be as engaged in water conservation activities as I can.	
	Perceived behavioral control over water conservation (PBCWC): (α = 0.82)		
PBCWC	1	Ease of commitment to water conservation activities.	[20]
	2	I think I have the required resources including time and skills to use water protection methods.	
	3	I believe I have the economic ability to employ water protection measures.	
	4	Feasibility of water conservation on the farm.	
	5	Having the required knowledge for water conservation.	
	Intention towards water conservation (IWC): (α = 0.73)		
IWC	1	Willingness to employ water protection methods.	Self-developed
	2	Willingness to pay for protecting water resources.	[24]
	3	Willingness to encourage and persuade other farmers to protect water resources.	Self-developed
	Water conservation behavior (WCB): (α= 0.87)		
WCB	1	I water my land at night or in the evening.	[4,25,26]
	2	I try to repair dilapidated irrigation channels.	
	3	I usually employ methods that are considered new in irrigation field.	
	4	I usually monitor the process of irrigation on my land.	
	5	I try to avoid wasting water, and for this purpose, I use methods such as sewage recycling.	
	6	Planting drought-resistant crops.	
	7	Non-irrigation of the ground during rain.	
	8	Storing rainwater for irrigation.	
	9	I am trying to use a cover on the irrigation lines (canal) that lead to my land.	
	10	I always check the irrigation pipes for leaks before watering.	

Note: Source: Results of present study.

2.4. Data Analysis and Measuring Constructs

The information gathered was analyzed by packages $SPSS_{24}$ and $AMOS_{20}$. The main response variable in present cross-sectional survey was the WCBs of farmers, which were defined as "pro-environmental behaviors of farmers id using water resources. Such behaviors do not have negative impacts on agricultural water resources". To operationalize the farmers' WCB, 10 behavioral items proposed by Dolnicar et al. [25] and Yazdanpanah et al. [4] were applied. To measure this variable, a five-point Likert scale was used (1: very low to 5: very high). As was mentioned earlier, the independent variables in this study are IWC, AWC, SNWC, and PBCWC. The items used to measure each of the variables are also listed in Table 1 (these variables are also evaluated using a five-point Likert scale (1: very low, 2: low, 3: average, 4: high, and 5: very high), and only the perceived behavioral control variable was measured using a five-point Likert scale (1: totally disagree to 5: totally agree).

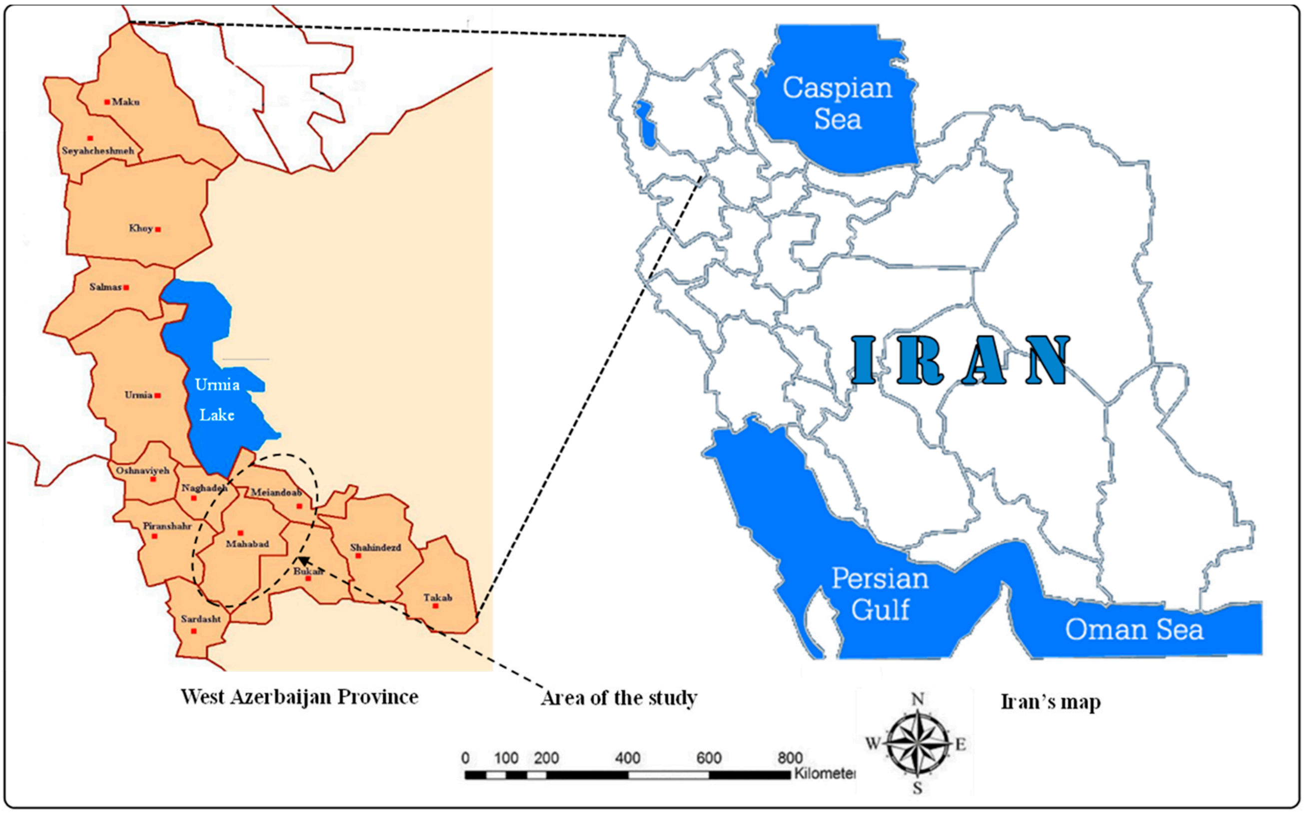

Figure 2. The site of the study area.

3. Results

3.1. Correlations of the Study Variables

The correlation coefficients between the study's constructs of the theoretical framework were analyzed by calculating the Pearson correlation values (Table 2). The results showed that IWC, AWC, and PBCWC have positive correlations with WCB. The correlations of these three constructs with WCB were r = 0.559 (p = 0.01), r = 0.346 (p = 0.01), and r = 0.04 (p = 0.01), respectively. It should also be mentioned that these coefficients were statistically significant. Similar results have been reported by scholars including Chan and Bishop (2013) [16] and Yazdanpanah et al. (2014) [4]. Based on these results, IWC has the highest correlation with WCB. Such findings emphasize that this variable is more capable of explaining the WCB than the other variables. In addition, the investigation into their correlational relationships demonstrated that SNWC had a statistically significant and positive correlation with the construct IWC. The correlation value for the relationship between these two constructs and the probability are r = 0.510 and $p < 0.01$, respectively. Furthermore, the constructs including AWC (r = 0.0556, $p < 0.01$) and PBCWC (r = 0.0329, $p < 0.01$) also have a significant correlation with the intention to conserve water resources variable. The correlation of these constructs with the intention of the farmers was positive. The findings of Ajzen (1991) [8] and Valizadeh et al. (2021) [26] have supported these findings.

Table 2. The results of analyzing the relationship among constructs using Pearson correlation coefficients.

	WCB	IWC	AWC	SNWC	PBCWC
WCB	1				
IWC	0.559 **	1			
AWC	0.346 **	0.556 **	1		
SNWC	0.545 *	0.510 **	0.498 **	1	
PBCWC	0.433 **	0.329 **	0.415 **	0.298 **	1

Notes: Source: Results of present study. * p value ≤ 0.05, ** p value ≤ 0.01.

3.2. Measurement Models' Estimations

A summary of the results of the measurement models' estimations is presented in Table 3. With respect to the findings obtained from this section of the analysis, the correlation coefficients or loading factors of the items of all the studied variables were suitable. In other words, these values were higher than the acceptable value of 0.4. As was mentioned earlier, CR is considered to be one of the reliability and validity indices. The observed results for this index were greater than 0.7, and are considered acceptable. The AVE index is a criterion for assessing the convergent validity. The values of this convergent validity index in all the extended PBT variables were greater than 0.5. Therefore, it can be concluded that the convergent validity of the constructs was verified. Considering that the values of the ASV and MSV indices are also less than the values of AVE, it can be inferred that the divergent (discriminant) validity of the questionnaire is reliable. In addition, the normality indices (Mardia's coefficients of multivariate skewness and kurtosis) also confirmed the suitability of the data for the main structural model.

Table 3. Measurement models' estimations for items measuring the variables of the framework.

Items/Variables/Normality Measure	IWC	SNWC	PBCWC	AWC	WCB	Skew	Kurtosis
IWC1	0.76 *					0.521	0.325
IWC2	0.81					0.457	0.459
IWC3	0.67					−0.623	0.201
IWC4	0.50					0.321	0.780
SNWC1		0.69 *				1.530	−2.326
SNWC2		0.75				0.376	1.203
SNWC3		0.64				0.901	−0.607
PBCWC1			0.60 *			0.824	0.308
PBCWC2			0.71			0.821	0.171
PBCWC3			0.70			0.260	0.921
PBCWC4			0.58			0.389	0.458
PBCWC5			0.75			−1.50	0.603
AWC1				0.57 *		1.695	−0.620
AWC2				0.55		0.326	0.985
AWC3				0.75		1.374	0.789
AWC4				0.64		0.238	0.482
AWC5				0.79		1.781	0.265
AWC6				0.73		0.244	−1.550
WCB1					0.51 *	0.308	0.905
WCB2					0.55	−1.238	0.581
WCB3					0.59	0.382	−0.398
WCB4					0.53	0.235	1.11
WCB5					0.72	0.865	0.659
WCB6					0.62	0.095	−1.065
WCB7					0.73	0.237	0.691
WCB8					0.68	0.359	0.816
WCB9					0.74	−1.330	0.872
WCB10					0.61	0.236	0.539
CR	0.75	0.74	0.73	0.71	0.72	-	-
AVE	0.71	0.68	0.62	0.56	0.59	-	-
MSV	0.39	0.34	0.28	0.47	0.17	-	-
ASV	0.42	0.27	0.09	0.19	0.36	-	-

Notes: * Represents the fixed item in the modeling process. Source: Results of present study.

3.3. Estimating the Mediation Structural Model for Extended PBT

In the extended PBT, IWC mediated the relationship between WCB and AWC, SNWC, and PBCWC, and the mediation structural model was applied for modeling (Table 4).

The results of analyzing the association among the constructs by this form of structural modeling demonstrated that both AWC (β = 0.370; $p < 0.001$) and SNWC (β = 0.308; $p < 0.001$) had positive impacts on the construct IWC. The effects of these constructs were statistically significant. In contrast, the impact of PBCWC on IWC was not statistically significant (β = −0.089; n.s.). These results are demonstrated in Figures 3–5. These figures show the scatter plot of IWC against each of the independent variables (AWC, SNWC, and PBCWC).

Table 4. The direct effects on the constructs IWC and WCB based on structural modeling.

Relationship	Estimates (Un-standardized)	Standard Error (S.E.)	Estimates (Standardized)	Significance	Result of Test
AWC→IWC	0.284	0.041	0.370	0.001	Supported
SNWC→IWC	0.460	0.076	0.308	0.001	Supported
PBCWC→IWC	0.113	0.062	0.089	0.069	Un-supported
IWC→WCB	0.679	0.251	0.169	0.007	Supported
PBCWC→WCB	0.172	0.292	0.033	0.557	Un-supported
AWC→WCB	0.871	0.199	0.283	0.001	Supported

Note: Source: Results of present study.

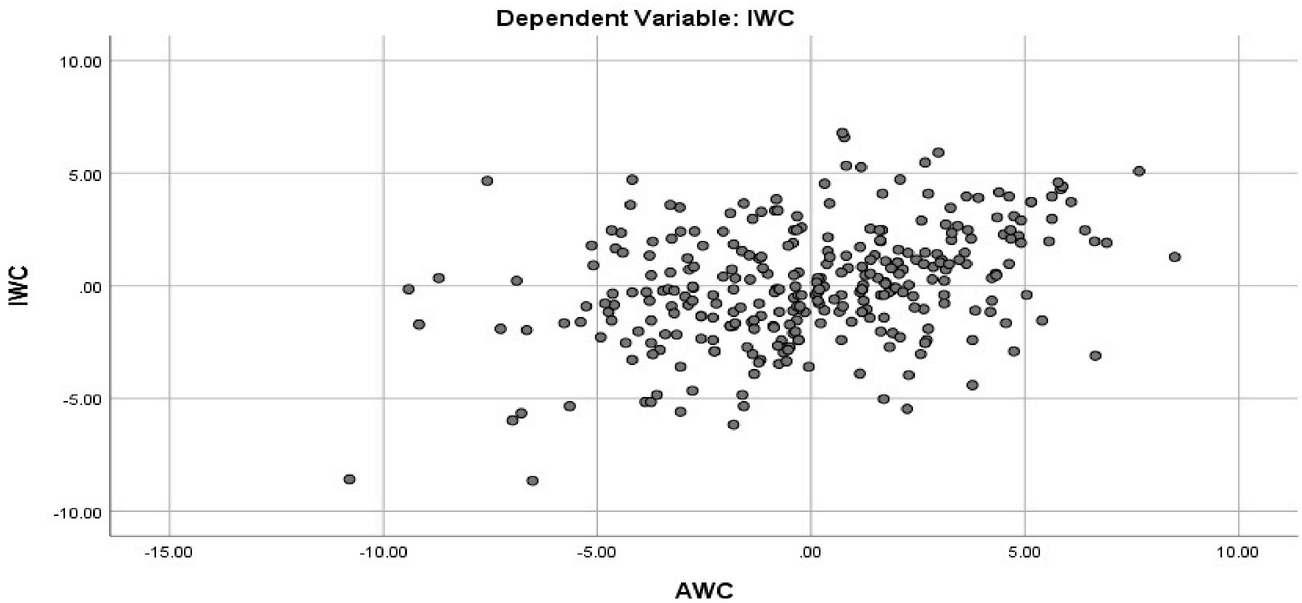

Figure 3. The regression scatter plot of IWC against AWC.

The investigation of the direct effects of the constructs IWC, PBCWC, and AWC on WCB also revealed that two variables, AWC (β = 0.283; $p < 0.001$) and IWC (β = 0.169; $p < 0.001$), positively and significantly influenced farmers' WCB. On the other hand, the effect of PBCWC (β = −0.033; n.s.) on WCB was not significant (Table 4). Figures 6–8 show the scatter plot of WCB against each of the independent variables (IWC, PBCWC, and AWC). As shown in the results of this section (Figure 9), AWC and SNWC had the greatest standardized effects on IWC. AWC and IWC were the strongest WCB predictors. These results indicate the crucial role of these variables in framing farmers' WCB and IWC.

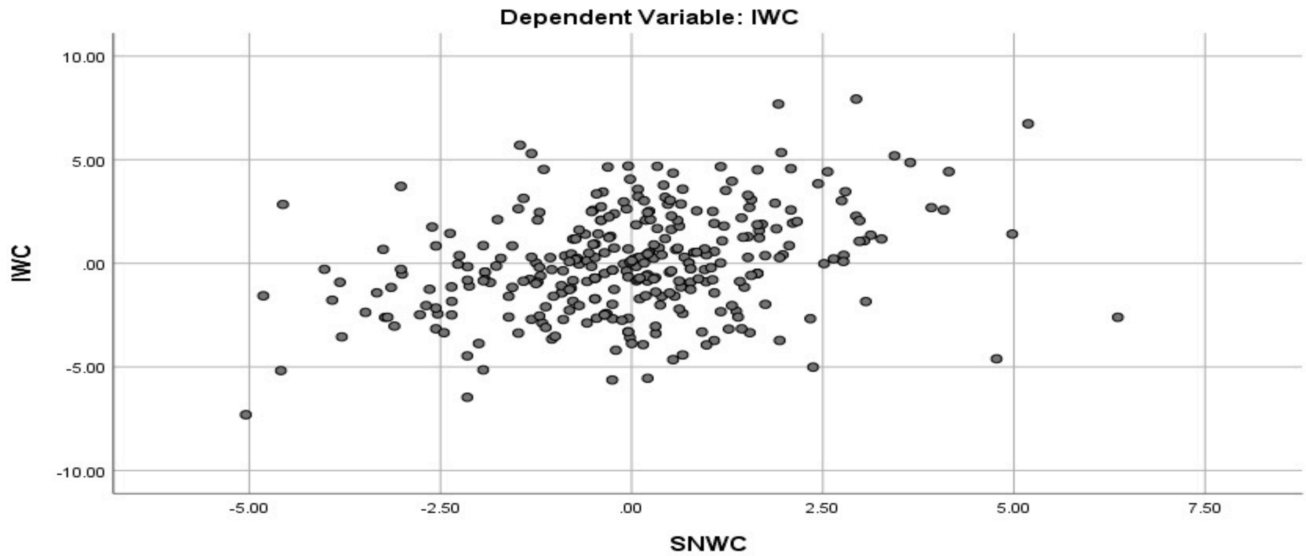

Figure 4. The regression scatter plot of IWC against SNWC.

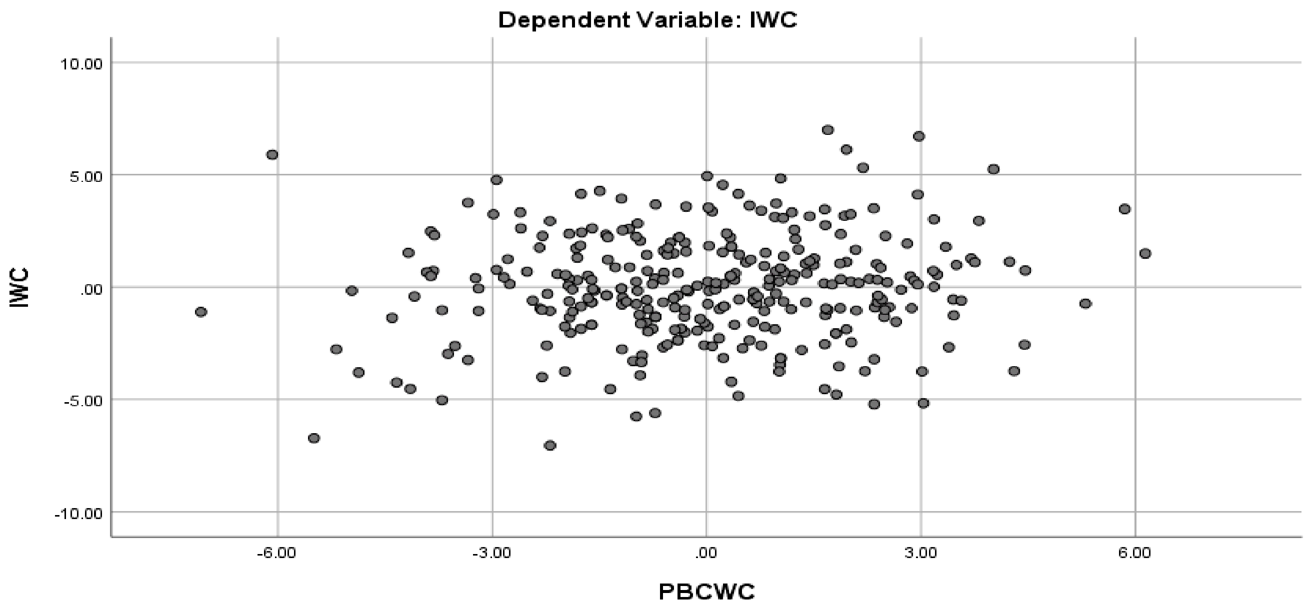

Figure 5. The regression scatter plot of IWC against PBCWC.

3.4. Estimation of Direct and Indirect Effects on WCB

Three variables, AWC, SNWC, and PBCWC, had indirect effects on WCB. With respect to the indirect effects of these constructs, it can be concluded that AWC and SNWC had the most powerful indirect effects, respectively. In addition, our analysis of the total effects of AWC, SNWC, PBCWC, and IWC on farmers' WCB revealed that AWC and IWC had the highest total effects, respectively (Table 5). However, it should be noted that SNWC and PBCWC did not have significant total effects on farmers' WCBs.

Table 5. The results of estimating the indirect and total effects on WCB.

Construct	Effects (Direct)	Indirect Standardized Estimates	Total (Causal Effects)
AWC	0.283	0.062	0.345
SNWC	-	0.052	0.052
PBCWC	0.033	0.015	0.044
IWC	0.169	-	0.169

Note: Source: Results of present study.

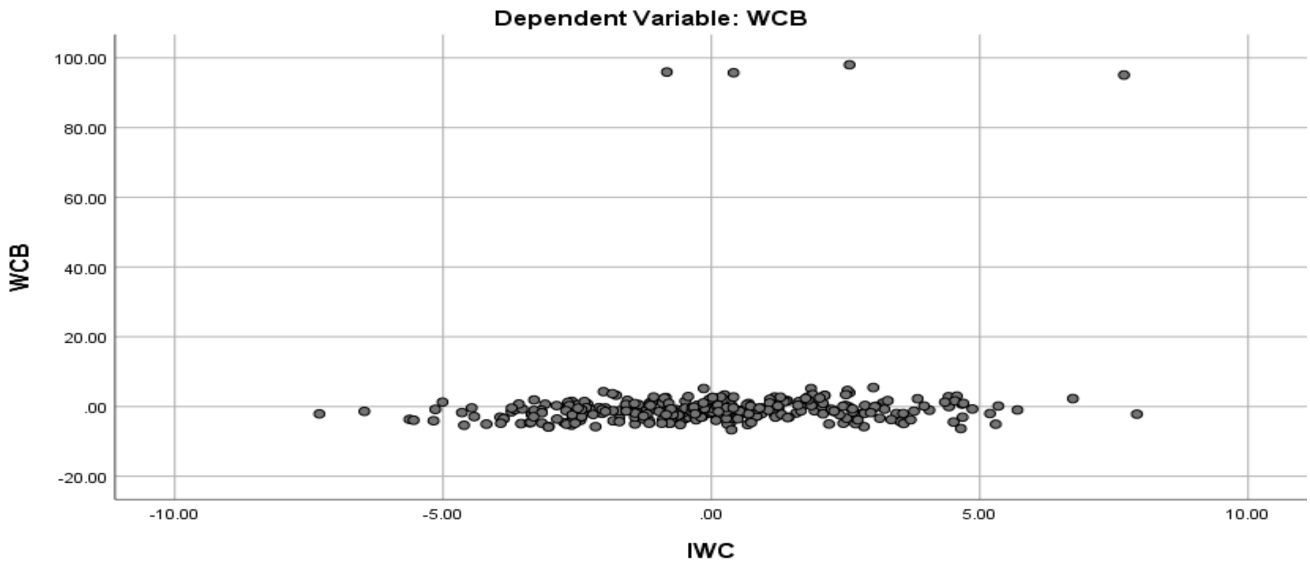

Figure 6. The regression scatter plot of WCB against IWC.

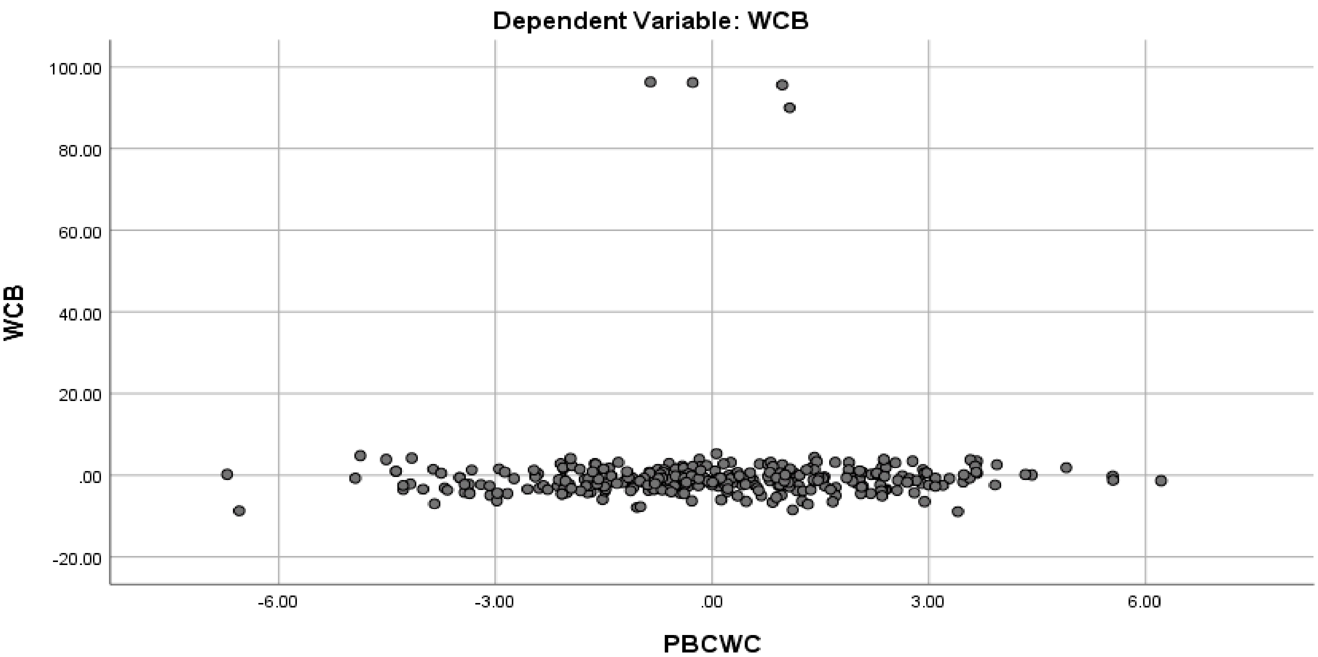

Figure 7. The regression scatter plot of WCB against PBCWC.

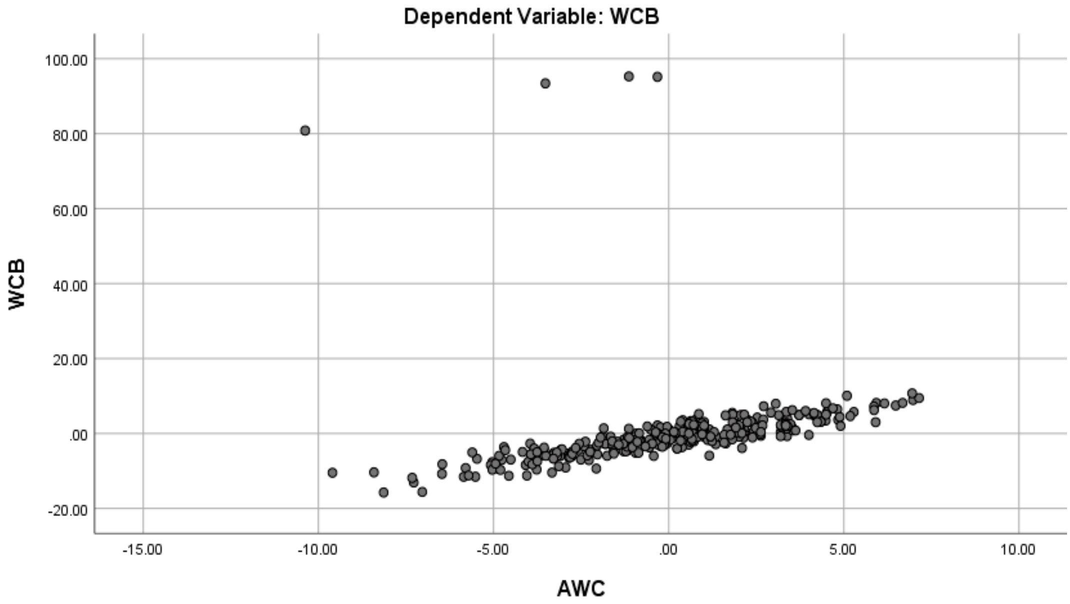

Figure 8. The regression scatter plot of WCB against AWC.

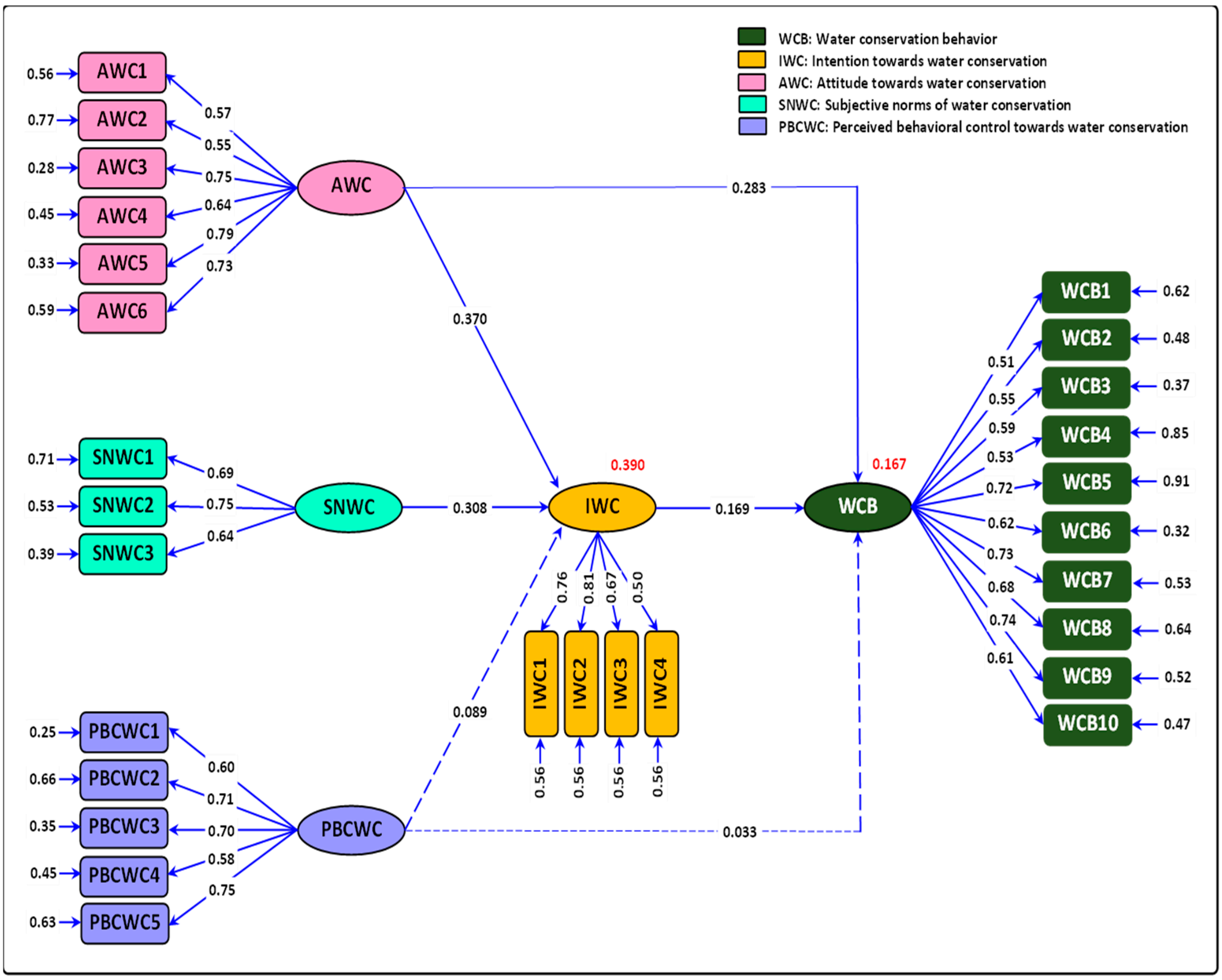

Figure 9. Tested structural model for extended TPB. Source: Results of present study.

3.5. Estimation of Fitness Indices of Extended PBT

In modeling the structural equations of the extended PBT, the fitness indices were also estimated (Table 6). The results of comparing the estimates of the obtained fitness indices with their acceptable values demonstrated that the structural model of the extended PBT has a good fit.

Table 6. Cut-offs and results for fit indices.

Fit Index	Cut-Off	Results for Present Study
Adjusted goodness of fit index (AGFI)	≥0.90	0.929
Incremental fit index (IFI)	≥0.90	0.940
Comparative fit index (CFI)	≥0.90	0.918
Normed fit index (NFI)	≥0.90	0.922
Goodness of fit index (GFI)	≥0.90	0.910
Chi-square normalized by degrees of freedom (CMIN/DF)	≤5	2.71
Root mean square error of approximation (RMSEA)	≤0.10	0.047

Note: Source: Results of present study.

4. Discussions and Policy Implications

The results showed that the effects of AWC on IWC and WCB are significant. Based on this result, it can be mentioned that by improving farmers' AWC, their IWC and WCB can be improved. This result is in line with the findings of Yazadnpanah et al. [4], Valizadeh et al. [27], and Si et al. [20]. These researchers concluded that farmers' attitudes usually depend on the social norms of agricultural communities. However, the results of the present research demonstrated that having a desirable AWC among farmers depends on their awareness of the benefits of employing water conservation activities, their understanding of the adverse consequences of not conserving water resources, whether their individual goals align with collective goals of water consumption, and their previous experiences of using water consumption optimization technologies. This was one of the most important contributions of the present research to the previous research literature. In this regard, it is suggested that regional and national water policy makers and decision makers emphasize raising awareness in agricultural communities about the benefits of water conservation and the negative consequences of non-conservation in water macro-programs and policies. These awareness-raising programs can be performed in the form of training courses by institutions, such as regional water organizations and the Agricultural Jihad Organization. It is worth mentioning that in these training courses, efforts should be made to encourage farmers not to merely justify water conservation in terms of personal and individual goals. In contrast, they must be encouraged to realize that their efforts in water conservation are useful for the agricultural community and future generations.

According to the results, SNWC had a positive and significant impact on IWC. Similar results can be found in the studies of Warner and Diaz [28], Gibson et al. [29], and Shahangian et al. [30]. The previous literature mainly focuses on the role of farmers' peers in discussing subjective norms. However, in present study, the authors highlight the significant role of the acquaintances, friends, and family members of farmers. In other words, in this study, we argue that subjective norms about water conservation and consumption can originate from internal and external rules that acquaintances, friends, and family members have set for water conservation. This is an innovative perspective on these subjective norms that can be very useful in changing farmers' behaviors. This result shows that the acquaintances, friends, and peers of farmers can influence their intentions toward water conservation. This effect, commonly known as social pressure, can be positive or negative. However, this social pressure can play a significant role in enhancing IWC if it is positive and based on accepting water-efficient methods. In this regard, it is recommended that individuals directing collective thinking in families and agricultural communities, such as those who are literate, thought leaders, modernists, and elders, are identified using sociological studies. After identifying people influencing collective thinking, practitioners and authorities of agricultural extension and innovation transfer should make effort to introduce them to water conservation technologies and innovations. Considering their influence in agricultural communities, they can encourage the most farmers to engage in water conservation technologies and activities. In this case, the costs of developing and transferring water conservation technologies are also reduced. It is also suggested that farmers' agricultural associations are identified and strengthened, because the leaders of such organizations can use the existing participatory and collective environment in these associations as an opportunity to promote IWC.

According to PBT, IWC is the key determinant of WCB. The results of this study also indicated that the effect of IWC on WCB was positive and significant. These results have supported the findings of Correia et al. [31], Valizadeh et al. [32], and Fauzi et al. [33]. The present study supports the main assumption of PBT, which is the main theory of the economic man worldview. However, by comparing the standardized coefficients of the effective variables on IWC, it can be found that the strength of IWC's impact on WCB is not very impressive. In addition, the explained variance in WCB as the main dependent variable is not high. From a practical point of view, it can be said that the economic man worldview has a relative and moderate ability to analyze the WCBs of farmers. This means that this worldview ignores some of the facts and roots of farmers' water conservation behaviors and intentions. This worldview ignores ethical considerations in analyzing farmers' IWC and WCB. Therefore, it is recommended that some variables, such as moral norms, environmental concerns, and environmental values, are added to PBT in future studies to develop and increase its explanatory power. In addition, the effect of the PBCWC variable on IWC and WCB was not significant, and this factor reduced the explanatory power of the model.

5. Conclusions, Limitations, and Future Directions

The purpose of this study was to conceptualize the water conservation activities of farmers through the lens of the economic man worldview. The present study had several important conclusions which are briefly highlighted in this section. First, AWC has the potential to directly affect both WCB and IWC. Second, SNWC has a positive and significant effect on IWC. Third, the effects of PBCWC on WCB and IWC were not significant. Fourth, IWC was able to significantly mediate the relationship between AWC and SNWC with WCB. Fifth, the economic man worldview has a moderate ability to predict farmers' intention to use water and their water use behavior. This is perhaps the most important and innovative conclusion of the current research, because it is the first time that a study has focused exclusively on the application of the economic man worldview in the analysis of farmers' water consumption and conservation behaviors. In this regard, the results of this research can be very useful in shaping and directing future studies and interventions for water protection and exploitation. In other words, practitioners, decision makers, and implementers of behavioral change programs advocating for the optimal consumption of water resources can use the results of this research to accelerate the process of social and psychological changes.

This study also had limitations. Therefore, based on these limitations and the results of the research, some applicable suggestions can be made for future research. The first limitation was related to the studied context, in which there were different ethnicities, including Turks and Kurds. This made the process of data collection and drawing conclusions difficult, because, in some cases, the ethnic contexts of the respondents may influence their behaviors and tendencies. In this regard, it is suggested that future researchers examine the worldview of the economic man among different ethnicities. Examining this issue can lead to new insights in the field of whether the worldviews of farmers of different ethnicities are different or not. Moreover, future researchers can investigate the applicability of the economic man worldview among different ethnicities with comparative studies. The second limitation was related to the data collection paradigm. In this study, the collected data were based on the self-reports of the participants. Qualitative methods of data collection, such as in-depth interviews and grounded theory, can help confirm the results of the present study. In this regard, it is recommended that in future research, the application of the economic man worldview in the water consumption behaviors of farmers is investigated using data gathering methods, such as case studies, in-depth qualitative interviews, and grounded theory. The third limitation is related to the lack of reference data to compare the results of this research with. Nevertheless, the results of the current research can be used as reference data for future research. In this regard, it is suggested that future researchers repeat this study with a larger number of samples in the same region and compare their results with the results of the present study. The fourth limitation was related to economic limitations, which challenged the possibility of conducting cross-validation in other regions. In this regard, it is suggested that future researchers use the framework used in this study in other regions of Iran, in other countries of the world, and among different groups of farmers. This can help to cross-validate the results of the present research. It should be noted that recently, new methods such as artificial intelligence (AI)-based techniques have also been introduced to predict behavior, and seem to be useful in explaining farmers' water conservation behaviors. In this regard, it is recommended that future studies use this method to predict the water conservation behaviors of farmers and compare their results with the results of the current research. Such comparative studies can help identify new or hidden dimensions of water conservation behaviors.

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