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Transition of Objective to Subjective Well-being in Evaluation of Farmers' Quality of Life: Utilizing New Epistemological Approach among Iranian Rice Farmers

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ABSTRACT

Human well-being is one of the main goals of sustainable rural development. Indeed, human well-being demonstrates rural societies' quality of life. This concept consists of objective and subjective well-being dimensions. Although it is assumed that objective well-being is rationally related to subjective well-being, this relationship has not been fully confirmed in past studies. Three main reasons including the geographical level of assessment, the type of data used, and different epistemological perspectives have separated objective well-being assessment from the subjective one. We used the same geographical level, type of data used, as well as epistemological perspective in order to evaluate the relationship between objective well-being and subjective well-being among rice farmers. Using a questionnaire, a survey was carried out among 384 rice farmers (Response rate= 92.3%) in the main rice cultivation areas in Iran. The study sample was chosen by a two-stages cluster random sampling technique. Face to face personal interview was also used as the form of data collection. The results of structural equation modeling illustrated that farmers' perception of economic, social, and environmental well-being as objective well-being domains significantly explained their subjective well-being constructs including happiness as well as life satisfaction. In fact, life satisfaction and happiness would be changed once farmers mentally perceive objective well-being domains. Therefore, objective well-being indicators can affect subjective well-being constructs, including life satisfaction and happiness, if they are assessed based on farmers' self-evaluation.

Keywords: Farmers' perception, Happiness, Life satisfaction.

INTRODUCTION

Improving the rural residents' economy and social standards in conjunction with environmental protection is the main purpose of sustainable development (Nourozi and Hayati, 2017). Improving farmers living situation depends on Human Well-Being (HWB) dimensions including economic, social, as well as environmental needs satisfaction (Costanza *et al*., 2007).

From another perspective, farmers' happiness and life satisfaction are the main goals of HWB among rural societies (Nielsen *et al*., 2010). Almost all studies have considered HWB indicators as the most significant criteria to evaluate sustainable rural development (McShane *et al*., 2011; Panagopoulos *et al*., 2016). HWB refers to the level of human needs attainment (Costanza *et al*., 2007; Easterlin, 2003). HWB has been basically established on Maslow's hierarchical needs theory (Summers *et al*., 2012). According to the theory of human motivation, the need has been defined as the existing gap between human current and ideal status (Maslow, 1943). Consequently, HWB could be enhanced as people satisfy their hierarchical needs. Therefore, improving HWB causing happiness and life satisfaction is necessary to achieve sustainable rural development.

Although farmers are the main rural residents

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in developing countries, they mostly live under difficult conditions with limited healthcare, resources, accessibility to markets, and educational facilities (Wu *et al*., 2010; Yip *et al*., 2007). Consequently, living situation has an important role in the future of agriculture because the inadequate farmers living situation causes farmers to exit from agricultural activities (Peel *et al*., 2016).

Farmers are the main food producers in Iran. Rice (*Oryza sativa*), as the second main food in Iran, is mainly cultivated in Guilan and Mazandaran Provinces in the north of Iran, with more than 60% of rice farmlands (Khoshnevisan *et al*., 2014; Aghaalikhani *et al*., 2013). The main economic activity of rural residence in the north of Iran is rice farming (Khoshnevisan *et al*., 2014; Aghaalikhani *et al*., 2013). Although rice farmers have indispensable role in food security in Iran (Pishgar-Komleh *et al*., 2011), they are typically under inappropriate living situation. The average of rice farmlands in Iran is lower than 0.6 ha and rice farming is non-mechanized in Iran (Pishgar-Komleh *et al*., 2011). In addition, rice farmers are facing critical issues such as low income, inadequate education, lack of modern knowledge, and low energy efficiency in rice production, causing inadequate income, low level of welfare and wealth (Soltani *et al*., 2014; Khoshnevisan *et al*., 2014). In other words, rice farmers typically use intense chemical inputs and inefficient irrigation systems because of lack of sufficient capital (Soltani *et al*., 2014; Pishgar-Komleh *et al*., 2011). On the other hands, rice farmers' health is threatened by the traditional farming methods because of excessive use of chemicals (Zazouli *et al*., 2010). There is also some evidence that show some HWB factors such as low income and hard living situation could lead rice farmers to leave rice farming and damage the ecosystem (Niyaki *et al*., 2010). To address these issues, agricultural policy makers are trying to increase the level of HWB (subjective and objective) by improving economic, social, and environmental efficiency of the farms (Soltani *et al*., 2014; Khoshnevisan *et al*., 2014). Albeit determination of HWB is critically required for improving rice farmers' well-being, it has not been measured among Iranian rice farmers, so far. Therefore, policy makers need to determine the effect of objective well-being on subjective well-being among rice farmers.

As a result, we first need to show the level of HWB among rice farmers. To do so, understanding of HWB concepts and its measures are crucial for assessment of farmers' quality of life; therefore,.

The relationship between Objective Well-Being (OWB) indices and subjective well-being has been one of the major concern in HWB studies (Frey and Stutzer, 2010; Alcamo, 2003). In other words, previous literature critically discussed some important questions such as how changing the ecosystems can affect subjective well-being?, which of OWB domains (social, economic and environmental) should be changed to make societies happy?, what is the response of farmers (cognitive response) to the OWB changes [Millennium Ecosystem Assessment (MEA), 2005]. Happiness and life satisfaction can be theoretically shaped by a reasonable level of OWB dimensions (income, shelter, education, ecosystem services) (McShane *et al*., 2011; Healy and Cote, 2001). Decisions on priority actions to improve HWB need to determine the exact relationship between economic, social, and environmental well-being and happiness and life satisfaction (Toth, 2003). Healy and Cote (2001) also suggested the importance of potential correlation between some objective measures (such as income) and life satisfaction in HWB assessment. Toth (2003) mentioned that changes in individuals' responses to changes in objective indices can portrait the role of objective well-being in subjective well-being. To increase happiness and life satisfaction, policy makers need powerful indicators of objective well-being to predict the subjective ones (happiness and life satisfaction) (Kelley and Evans, 2015; Frey and Stutzer, 2010). Additionally, the linkage between ecosystem services (water, soil formation etc.), socio-economic factors (shelter, social relationship) with subjective wellbeing (feeling well, happiness and life satisfaction) is crucial in identifying which linkage should be straightened or moderated to make individuals happy (MEA, 2005; Healy and Cote, 2001; Frey and Stutzer, 2010). It is a major concern of government policy makers to respond to which level of objective well-being measures to lead farmers to higher level of happiness and life satisfaction (Nielsen *et al*., 2010). There are also few studies

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that show some objective measures such as income, wealth, and inequality can be perceived and measured as subjective matters in HWB studies (McShane *et al*., 2011; Kelley and Evans, 2017). In contrast, there are some evidence that show objective measures like income (micro) along with Gross Domestic Product (GDP) (macro) are not significantly related to happiness and life satisfaction (Kelley and Evans, 2017; Frey and Stutzer ,2010). Therefore, some critical questions have been continuously arisen in past studies, for example, what is the relationship between OWB measures and SWB?, which factor (OWB criteria) should be improved to make farmers' society happy?, in which level of OWB indicators people feel happy and satisfied with their life (based on some indicators including income, education, etc.) (Diener, 1985, 2000; Horton *et al*., 2017; Nielsen *et al*., 2010).

Some effort has been made to modify objective well-being measures to create an appropriate index representing the relationship between objective and subjective well-being (Fulford *et al*., 2015; Horton *et al*., 2017; Kelley and Evans, 2015). Previous studies have also illustrated that objective well-being measures are not capable enough to understand what level of these measures makes societies happy (O'Donnell and Oswald, 2015; Satici, 2016). Frey and Stutzer (2010) believe that the advantage of measuring OWB indices based on subjective measures can explain the level of objective well-being effectiveness on happiness. Therefore, the role of OWB in SWB is assumed to be assessed using subjective measures. Consequently, considering the effects of OWB on happiness and life satisfaction is one of the main challenges in HWB studies (Kelley and Evans, 2017; Nielsen *et al*., 2010).

HWB measures the degree of satisfied human needs. There are various evaluation methods and perspectives to assess HWB. A number of HWB measures have been designed based on economic perspective. Economic perspective mainly concentrates on economic indicators such as Gross Domestic Production (GDP), life expectancy, income per capita, housing situation, purchasing power, etc. (Shams, 2016; Jorgenson *et al*., 2014; Kelley and Evans, 2015; McShane *et al*., 2011).

Another HWB perspective has mainly concentrated on the social aspects of human needs including social relationships, educational status, social participation, social security, health, etc. (Fulford *et al*., 2015; Horton *et al*., 2017; Kelley and Evans, 2015; Mayer *et al*., 2017). Based on the Social Well-Being (SOWB) perspective, it is assumed that, like economic development, social development has an essential role in sustainable development (Holt-Giménez, 2002; van Kamp *et al*., 2003). Recently, environmental perspective has also been presented to assess the degree of satisfied environmental needs (Chenoweth *et al*., 2016; Costanza *et al*., 2016; Foo, 2016; Panagopoulos *et al*., 2016; Smith *et al*., 2013) such as Ecosystem Services (ES), sanitation system, landscape, water quality, etc. The evolutionary trend of HWB reveals that HWB assessments have tended to fluctuate from emphasis solely on economic to social and environmental aspects. These perspectives have created Objective Well-Being (OWB) approach. Based on OWB, the quality of the environment helps to enhance EWB and SWB in rural areas (Bertram and Rehdanz, 2015). Consequently, OWB consists of environmental, economic, and social Well-being.

From another perspective, Subjective human Well-Being (SWB) is presented as the purpose of OWB (Kelley and Evans, 2015; Sánchez *et al*., 2017; Satici, 2016; Crespo and Mesurado, 2015). SWB refers to perceptual experiences of individuals. According to Blanchflower and Oswald (2004), SWB is determined by happiness and life satisfaction that demonstrate the level of HWB.

It is expected that improvement of OWB and SWB increases HWB, but some researchers have a different perspective (Biedenweg *et al*., 2016; Blanchflower and Oswald, 2004; Joshanloo *et al*., 2017). Frey and Stutzer (2010) showed that improvement in some of the OWB indicators, such as GDP growth, was not associated with increasing life satisfaction (as a SWB indicator) as previously expected. O'Donnell and Oswald (2015) and Satici (2016) believe that OWB indicators have not been adequate to explain SWB. However, OWB and SWB are the main components of HWB and a number of studies have assumed the relationship between these two aspects (Dawson and Martin, 2015; O'Donnell and Oswald, 2015; Peel *et al*., 2016; Sánchez *et al*,. 2017). Accordingly, the question arises why OWB and SWB do not affect each other in some

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studies. This is the main problem in developing a comprehensive framework for evaluating HWB concept. The review of HWB assessment shows that diversified methods have been used to measure OWB and SWB. Dawson and Martin (2015), Fulford *et al.* (2015), Smith *et al.* (2013), and Summers *et al.* (2012) have mainly used GDP, life expectancy, water quality, soil quality, air pollution ratings, sanitation, physical and mental health to measure HWB. These studies have mainly considered OWB approach utilizing macro quantitative data to measure HWB and mainly utilized vast secondary data to measure HWB. In contrast, a number of studies have used SWB to show the level of HWB. Survey based on questionnaire and interview has been implemented in these research studies (Chenoweth *et al*., 2016; Jones, 2017; Ponocny *et al*., 2016; Joshanloo *et al*., 2017; Mahajan and Daw, 2016; Meiselman, 2016; O'Donnell and Oswald, 2015; Satici, 2016; Suh *et al*., 2017). O'Donnell and Oswald (2015) believe that SWB can truly determine HWB, because it uses in-depth methodologies to gain data directly from individuals, while OWB ordinarily utilizes a broad range of data obtained from statistical offices and administrative sources. McShane *et al.* (2011) revealed that both OWB and SWB are essential for HWB assessment, but they are applied in different geographical levels. SWB has usually been evaluated at local and regional levels (Blanchflower and Oswald, 2004; Jones, 2017; Joshanloo *et al*., 2017; Satici, 2016), while OWB is ordinarily implemented for international and national levels (Fulford *et al*., 2015; Horton *et al*., 2017; Kelley and Evans, 2015; O'Donnell and Oswald, 2015). Accordingly, the type of data used and research methods along with the level of geographical analysis are different in SWB and OWB studies.

Based on the psychological perspective, HWB is a mental concept (Easterlin, 2003; McShane *et al*., 2011) that is mainly related to human needs (Summers *et al*., 2012). Maslow (1943) defined needs as the gap between present and ideal status. Accordingly, one's personal needs should be perceived psychologically to lead to actual behavior (Maslow, 1943; Dawson and Martin, 2015; Rojas, 2008; Sheikh, *et al.* 2012). Therefore, the needs would be felt, if they are mentally perceived by a person. It means that, for example, based on economic standards, the average of income is appropriate, however, people may not be satisfied with their income. The epistemological review of OWB studies illustrated that OWB have mainly evaluated HWB based on behaviorism (Dawson and Martin, 2015; O'Donnell and Oswald, 2015). Therefore, OWB strategies have only focused on objective indicators such as income, job diversification, welfare, GDP, life expectancy, etc., and perceived needs have been relatively ignored (Thyer, 2009), while SWB studies have mostly evaluated HWB by mental indicators such as happiness and life satisfaction (Chenoweth *et al*., 2016; Foo,2016; O'Donnell and Oswald, 2015). According to the cognitive epistemology, individuals can first understand changes cognitively then respond behaviorally to the changes. Therefore, consideration of this perceptual aspect is more important than relying on visible signs (as outcome of perceived change) (Johanson and Brooks, 2010). SWB strategies have evaluated HWB based on cognitive epistemology (individual perception about their situation), because they have been designed based on perceptual procedures (individual perceptions). It seems that SWB has been more realistic than OWB. However, OWB measures some important human needs including health, income, participation level, etc. Consequently, OWB and SWB would be associated with each other, if both of them have the same epistemological foundation (cognitive epistemology) and geographical source of data. Consequently, the question arises whether it is possible that OWB is perceived by farmers like SWB. If so, how would be the relationship between perceived OWB and SWB? (Figure 1).

Thus, the present study aimed to investigate the role of perceived OWB (POWB) (based on individuals' self-evaluation) on SWB among Iranian rice farmers.

MATERIALS AND METHODS

To investigate the role of POWB on SWB, OWB dimensions extracted from previous studies were measured based on farmers' perception and the relationship of POWB and SWB (at the same epistemological level) were examined (Figure 2).

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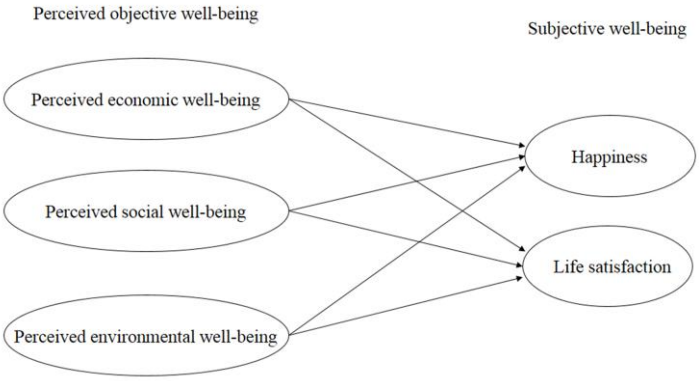

Figure 1. Hypothetical framework of the effect of perceived OWB on SWB among Iranian rice farmers.

Participants and Procedures

A survey based on the questionnaire was utilized to test the relationship between Perceived Objective Well-Being (POWB) and SWB. Since most of the rice farmers had no internet access, this study used paper-based questionnaire. The study was conducted on regional level (rice farmers in the north of Iran). Therefore, rice farmers from the main rice cultivating areas in the north of Iran (Mazandaran and Guilan Provinces) formed the study population (N= 254,478). The sample size was determined through the Krejcie and Morgan (1970) formula as follows:

(1). $S = X^2NP(1-P)/ d^2 (N-1) + X^2P(1-P)$

Where, S= Required sample size, X= Z value (e.g. 1.96 for 95% confidence level), N= Population size, P= Population Proportion (expressed as decimal assumed to be 0.5 (50%)), d= Degree of accuracy (5%), (expressed as a proportion (0.05); It is the margin of error).

Hansen and Hurwitz (1965) recommended using face-to-face questionnaire as the most accurate technique to complete the questionnaire. Therefore, face-to-face personal interview (totally, 415 interviews) was used in this study as the form of data collection. After screening process, 31 questionnaires were removed due to missing data and incomplete responses

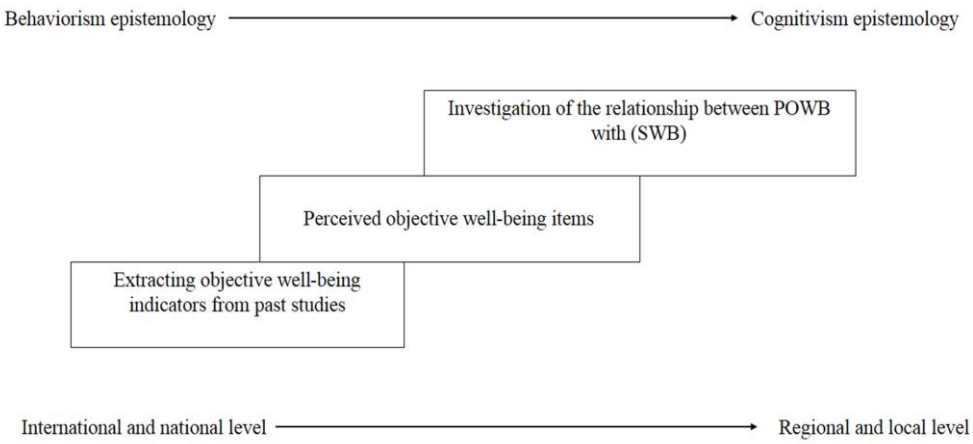

Figure 2. Overview of research process.

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(Response rate= 92.3%). Five interviewers were trained for a total of 6 hours by one of the authors. Interviews were conducted in the region by these interviewers, together with lead author. Finally, 384 responded to the interview. A multistage cluster random sampling method was used to draw a sample from each province. At the first stage of cluster random sampling, sample size was divided into the main rice cultivation areas in Guilan (n= 176) and Mazandaran (n= 207) Provinces. At the second stage, the sample size was divided into the main rural districts from each province using proportional allocation. Farmers from the main rural regions (based on the main rice cultivating areas) were randomly asked (Statistical Center of Iran, 2014) (Figure 3; Table 1).

Measurements

We used farmers self-evaluation about OWB indicators extracted from the literature (Bertram and Rehdanz, 2015; Biedenweg *et al*., 2016; Chenoweth *et al*., 2016; Fulford *et al*., 2015; Horton *et al*., 2017; Kelley and Evans, 2015; Mayer *et al*., 2017; McShane *et al*., 2011; Peel *et al*., 2016; Summers *et al*., 2012) to convert them as subjective ones (Table 2). Diener (2000) suggests that individual's self-evaluation about OWB indicators such as income is more realistic to show the relationship between OWB and SWB. According to Table 2, POWD shows the degree of Perceived Economic (PEWB), Social (PSWB), and Environmental (PENWB) needs' satisfaction, which were measured by 5-point Likert scales from 1 (completely undesirable) to five (completely desirable). Standard items were constructed in order to demonstrate SWB indicators (happiness and life satisfaction) (Table 2). Happiness was measured using four items scaled by 7-point Likert (Lyubomirsky and Lepper, 1999). Life satisfaction was constructed by five items on 7-point Likert scale (Diener *et al*., 1985). A pilot test was carried out among 30 rice farmers in Amlash, Guilan Province, Iran, to test the reliability of the instrument. The Cronbach's Alpha coefficient for the questionnaire items was acceptable (Table 2).

Structural Equation Modeling (SEM) was used to investigate the relationship between POWB and SWB. Therefore, PEWB, PSWB,

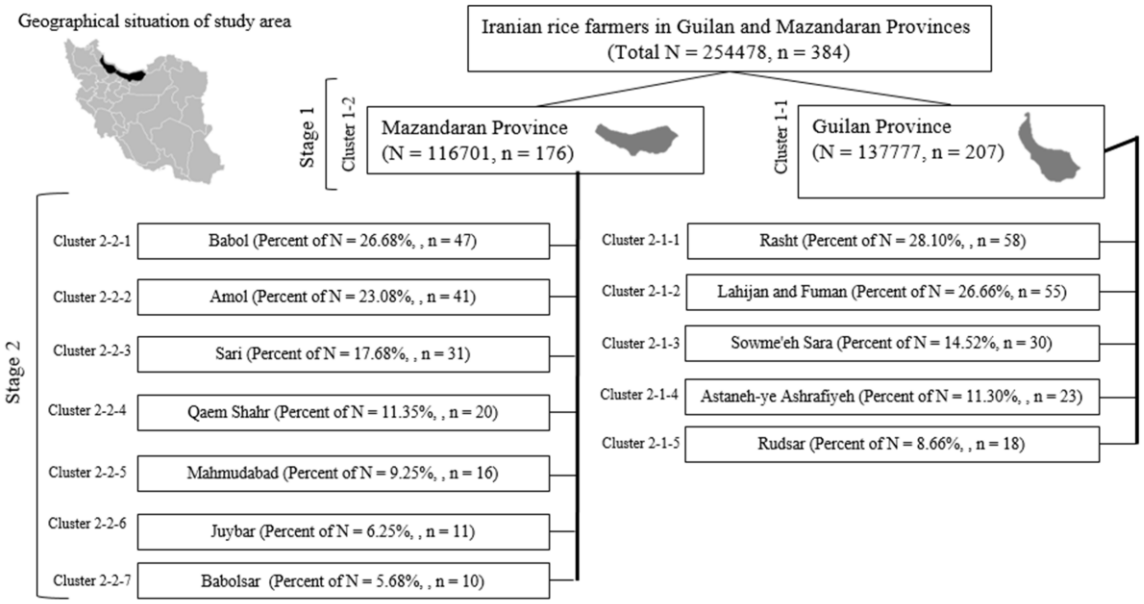

Figure 3. Sampling procedure of using two cluster random sampling method (proportional allocation).

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Table 1. The distribution of sample size among villages (stage two of cluster random sampling).

Villages (Based on each rural district)		Sample size (n= 384)
	Guilan Province	207
Rasht rural districts		58
	Lakan	13
	Aliabad	6
	Kenarsar	16
	Leshteneshah	12
	Sangar	9
Lahijan and Fouman rural districts		55
	Gorabpas	18
	Ahandan	12
	Loulman	11
	Lafmejan	14
Sowme'eh Sara rural districts		30
	Tavalom	8
	Ziabor	14
	Kasma	4
	Hendokhaleh	4
Astaneh-ye Ashrafyeh rural districts		23
	Chaondeh	6
	Gorka	5
	Kisem	3
	Dehga	6
Rudsar rural districts		18
	Rahim abad	5
	Reza mahale	7
	Chinijan	6
	Mazandaran Province	176
Amol rural districts		41
	Larijan sofla	4
	Daboyeh Miani	8
	Chalave	5
	Western Dashtsar	10
	Eastern Dashtsar	13
Babol rural districts		47
	Khoshroud	9
	Feyzieh	5
	Asbokala	7
	Sajadroud	10
	Firouzjah	9
	Babolkenar	4
	Lalehabad	3
Sari rural districts		31
	Tangesoleyman	5
	Chahardangeh	4
	Ferim	2
	Mianroud	10
	Eastern roudpey	7
	Farah Abad	3
Qaem Shahr rural districts		20
	Nokandeka	8
	Ali abad	7
	Balatajan	5
Mahmoudabad rural districts		16
	Northern Harazpey	5
	Western Harazpey	3
	Northern Ahlamrostagh	8

Table 1 continued…

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Continued of Table 1. The distribution of sample size among villages (stage two of cluster random sampling).

Villages (Based on each rural district)		Sample size (n= 384)
Joubar		11
	Larim	1
	Chikroud	3
	Siahroud	7
Babolsar		10
	Bahnmir	3
	Azizak	2
	Khoshkroud	5

Table 2. Demographic characteristics of rice framers.

Variables (N= 384)		Percentage (%)	Frequency (n)
Age (Year)			
	(Age< 20)	0	0
	(20≤ Age< 30)	4.4	17
	(30≤ Age< 40)	29.4	113
	(40≤ Age< 50)	37.2	143
	(50≤ Age< 60)	24.5	94
	(60≤ Age)	4.4	17
Sex			
	Female	16.7	64
	Male	83.3	320
Marital status			
	Single	7	27
	Married	93	355
Education			
	Incomplete formal education	35.4	136
	Vocational diploma	33.1	127
	Bachelor degree	25.5	98
	Graduate degree	6	23
Main job			
	Rice farming	80	303
	Others	20	81
Region			
	Guilan	54	198
	Mazandaran	56	176
Farm size (ha)			
	Less than 2	64.1	246
	2-4	28.9	111
	4-6	6.3	24
	6 and more	0.8	3
Income per month (US $)			
	less than 300	24.48	94
	300-500	48.44	186
	500-1000	20.57	79
	1000 and more	6.51	25
Land ownership			
	Owners	87.2	335
	Tenants	12.8	49

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PENWB were inserted as exogenous latent variables. Happiness and life satisfaction designated as endogenous latent variables. Confirmatory Factor Analysis (CFA) was used to test the validity and reliability of the scale items (Anderson and Gerbing, 1988). The items extracted on POWB, the Alpha Cronbach of each construct of the scale, descriptive statistics and CFA results are shown in Table 3.

RESULTS

Descriptive Analysis

The majority of rice farmers were aged between 20 to 50 years and more than 80% of them were male. They were typically married (93%; n= 355) and most of them (87.2%; n= 335) were owners of small plots of farmlands (ha) (M= 2.12; SD= ±1.31). Almost 68% of rice farmers had a high school diploma and lower level education. Rice farming was the main job for 80% of the respondents. The monthly income of most of the respondents was about US$500 (Table 2).

Findings illustrated that farmers` PEWB was lower than average (M= 2.49; SD= 0.97). PEWB5 (M= 2.31; SD= 0.94) was scored as the lowest PEWB construct and PEWB4 (M= 2.80; SD= 1.10) was determined as the highest construct. In other words, farmers considered the quality of housing better than the other PEWB constructs. Respondents also evaluated their financial ability to provide sufficient food (qualitatively and quantitatively) as the weakest PEWB construct. Table 3 shows that respondents scored their perception towards SOWB and ENWB more than average. They rated PSWB2 (M= 3.84; SD= 0.93) as well as PENWB4 (M= 4.07; SD= 0.81) as the strongest items in PSWB and PENWB domains. However, PSWB5 (M= 3; SD= 0.91) and PENWB2 (M= 3.56; SD= 0.91) were the weakest items. The relationship with family members (from PSWB) and the quality of soil (from PENWB) were rated fairly desirable by rice farmers. The perceived social equity (rights, services, etc.) as well as the quality of sanitation system was considered as the weakest items by the respondents. The mean score of happiness and life satisfaction was 3.48 (SD= 1.42) and 3.40 (SD= 1.18) (ranged from 1 to 7), respectively, indicating low satisfaction level with their life (Table 3).

Correlation Analysis

Pearson's correlation coefficient was used to test the relationship between the SWB indicators and PEWB, PSOWB and PENWB as three POWB domains. As can be seen in Table 4, all variables in both models are positively correlated to each other. According to Table 4, the strongest correlation was found between happiness and life satisfaction (r= 0.75, P< 0.001) and the weakest correlation was between happiness and PENWB (r= 0.54, P< 0.0001). According to the correlation analysis, POWB domains and SWB are positively correlated. As can be seen in Table 4, PEWB, PSOWB, and PENWB are positively related to happiness as well as life satisfaction, which means farmers' PEWB, PSOWB, and PENWB needs fulfillment measured psychologically could be associated with SWB dimension. Therefore, farmers with stronger POWB would be happier and satisfied.

SEM Analysis for Happiness Model Constructs

CFA results showed that the four-factor happiness model provided acceptable goodness-of-fit indices (x^2= 532.29, df= 269, P< 0.001, RMSEA= 0.051, CFI= 0.99, IFI= 0.99). Based on the results of SEM analysis, POWB domains explained 52% of happiness variance changes (Figure 4). SEM findings showed that PEWB was the most powerful predictor of happiness (β= 0.45, t-values= 6.65, P< 0.000). According to Figure 4, PSOWB was the second significant predictor of happiness (β= 0.21, t-values = 3.09, P< 0.000) and PENWB was positively related to happiness as the last predictor (β= 0.16, t-values= 2.66, P< 0.000). It means that farmers with more desirable PEWB, PSOWB, and PENWB would be happier.

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Table 3. Descriptive analysis of questionnaire items.

POWB and SWB items (n= 384)	Mean*	SD	Standard factor loading	AVE[a]	CR[b]
PEWB (α= 0.88)	2.49	0.97		0.52	0.88
1. How do you evaluate your monthly income?	2.45	0.98	0.73		
2. How do you evaluate your ability to buy whatever you want?	2.45	0.91	0.74		
3. How do you evaluate your savings (wealth)?	2.58	0.98	0.72		
4. How do you evaluate the quality of your housing?	2.80	1.10	0.71		
5. How do you evaluate your financial ability to provide enough food (for you and your family?	2.31	0.94	0.74		
6. How do you evaluate your economic equality (salary, services, jobs, markets, employment rights, etc.)?	2.50	0.96	0.72		
7. How do you evaluate your job (in terms of economic benefits)?	2.35	0.93	0.70		
PSOWB (α= 0.80)	3.31	0.96		0.50	0.90
1. How do you evaluate your educational level?	3.05	1.02	0.60		
2. How do you evaluate your relationships with your family members?	3.84	0.93	0.76		
3. How do you evaluate your relationships with other people?	3.69	0.90	0.75		
4. How do you evaluate your participation in social activities?	3.50	1.02	0.73		
5. How do you evaluate your social equality (rights, services etc.)?	3	0.91	0.68		
6. How do you evaluate your physical health?	3.05	0.98	0.73		
7. How do you evaluate your psychological health?	3.01	0.98	0.69		
PENWB (α= 0.91)	3.83	0.86		0.48	0.87
1. How do you evaluate the quality of water resources?	3.61	0.92	0.67		
2. How do you evaluate the quality of sanitation system?	3.56	0.91	0.70		
3. How do you evaluate the quality of air in your living area?	3.94	0.79	0.69		
4. How do you evaluate the quality of soil (in your farm)?	4.07	0.81	0.74		
5. How do you evaluate the quality of landscape in your living place?	4.06	0.84	0.77		
6. How do you evaluate the diversity of plants and animals species in your living place?	3.9	0.83	0.67		
7. How do you evaluate the capacity the environment for satisfying your needs?	3.72	0.95	0.59		
Happiness (α= 0.93)	3.48	1.42		0.73	0.92
1. In general, I consider myself: (1= Not a very happy person - 7= A very happy person).	3.40	1.35	0.83		
2. Compared to most of my peers, I consider myself: (1= Less happy – 7= More happy).	3.52	1.47	0.90		
3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you: (1= Not at all – 7= A great deal)	3.63	1.42	0.86		
4. Some people are not generally very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you: (1= Not at all – 7 = A great deal)	3.75	1.44	0.82		
Life Satisfaction (α= 0.83)	3.40	1.18		0.65	0.90
1. In most ways my life is close to my ideal	3.36	1.37	0.76		
2. The condition of my life is excellent	3.37	1.33	0.86		
3. I am satisfied with my life	3.52	1.28	0.69		
4. So far, I have received the important things I want in life	3.35	1.51	0.88		
5. If I could live my life over, I would change almost nothing.	3.41	1.59	0.82		

[a] Average Variance Extracted, [b] Composite Reliability.

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Table 4. Correlation matrix among models constructs.

Variables	PEWB	PSOWB	PENWB	Happiness	Life satisfaction
PEWB	1.00				
PSOWB	0.57**	1.00			
PENWB	0.54**	0.59**	1.00		
Happiness	0.57**	0.56**	0.54**	1.00	
Life satisfaction	0.65**	0.58**	0.56**	0.75**	1.00

** P< 0.01.

SEM Analysis for Life Satisfaction Model Constructs

SEM analysis revealed that POWB domains explained 57% of life satisfaction variance changes (Figure 5). The goodness of fit indices for the four factors of the life satisfaction model were calculated as acceptable (x^2= 605.78, df= 293, P< 0.001, RMSEA= 0.053, CFI= 0.99, IFI= 0.99). PEWB was positively related to life satisfaction as the strongest predictor (β= 0.48, t-values= 7.19, P< 0.000). PSWB (β= 0.27, t-values= 4.02, P< 0.000) and PENWB (β= 0.10, t-values= 1.77, P< 0.000) had also positive effect on life satisfaction. Therefore, farmers with strong POWB have strong life satisfaction as well. The results showed that the predictive power of POWB domains on life satisfaction was approximately the same as happiness model. It means that PEWB is the most powerful factor that positively affects farmers' happiness and life satisfaction (Figures 4 and 5).

DISCUSSION

Rice farmers' HWB includes both objective and subjective dimensions of HWB. From another perspective, HWB will be raised when OWB and SWB are enhanced. The relationship between objective and subjective dimensions of HWB has not been fully documented in the literature (Satici, 2016; van

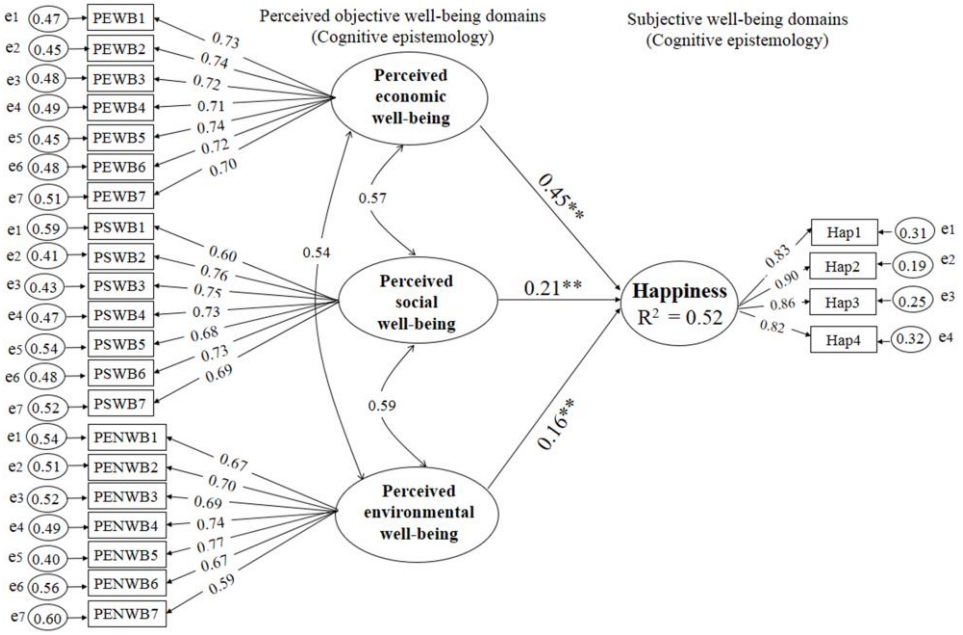

Figure 4. SEM analysis for happiness model.

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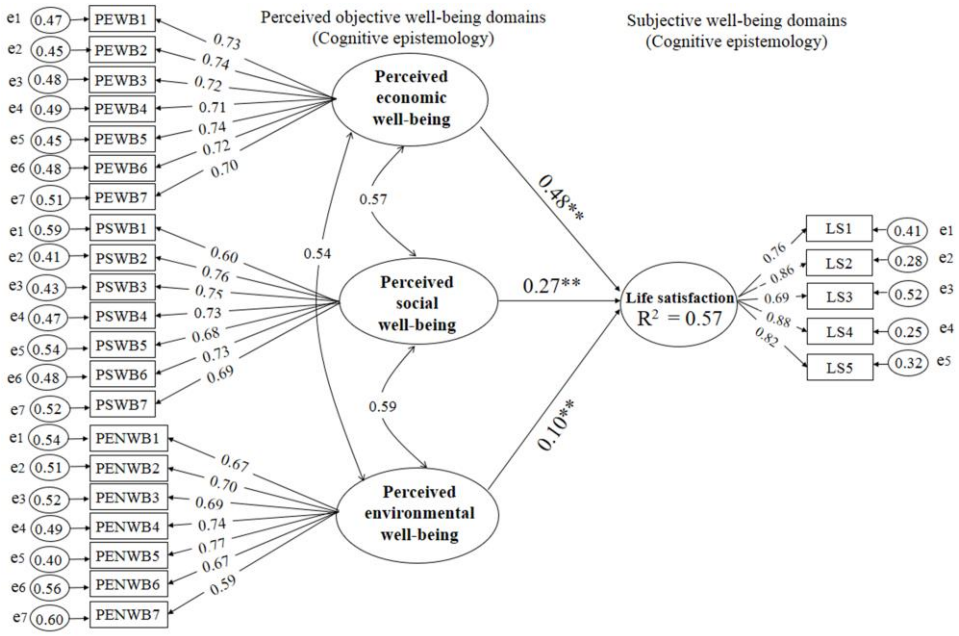

Figure 5. SEM analysis of life satisfaction model.

Kamp *et al*., 2003). In other words, empirical studies on HWB have not clearly identified the effect of OWB and SWB. On the other hand, there is no empirical evidence to show HWB among Iranian farmers. Therefore, we tested the effect of POWB on SWB for the first time among Iranian farmers.

We assumed OWB domains could be measured in local individuals using cognitivism's epistemology. Since cognitive epistemology implies on individuals' understanding of their needs, we tested the effect of farmers' self-evaluation by measuring HWB constructs as based on motivation theory (Maslow, 1943) on SWB constructs including life satisfaction and happiness. We tested he OWB constructs measured in the same level as SWB to investigate the relationship between OWB and SWB.

Our findings illustrated that EWB constructs could be psychologically perceived in general. It means farmers perceived their economic situation mentally. Therefore, PEWB refers to farmers feeling about their economic needs fulfillment. There is also some evidence that approves economic well-being constructs are mental such as feeling of richness (Kelley and Evans, 2015). We found that EWB is a psychological concept, so, measuring this notion should include both quantitative and qualitative measures. Empirical results illustrated that almost all PEWB constructs were perceived on a lower level. It means that farmers stated their basic economic needs such as income, purchasing power, wealth, housing, and equity and job situation on inadequate level.

Farmers stated PSOWB on a better situation in comparison with PEWB. Accordingly, farmers perceived their social needs on an average level. Results showed that farmers' statement about their PENWB constructs was over average. Therefore, the quality of natural resources including air, water, and soil was mentally felt as farmers' psychological needs.

We found that ENWB indicators could be mentally perceived by farmers, while Costanza *et al.* (2016) presented quantitative ENWB indicators such as quality of water. Our finding showed that farmers mentally perceived the quality of the ENWB. Eventually, we found that farmers could self-evaluate the prosperity of environmental needs fulfillment. Therefore, it is necessary to measure ENWB not only using quantitative assessment, but also utilizing farmers' perception about their need.

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The SEM findings showed that life satisfaction showing individual self-evaluation significantly is predictable by POWB indicators. PEWB measures were the main predictors of life satisfaction. As Frey and Stutzer (2010) argued that EWB was the main factor to assess HWB and finally quality of life. Findings present study also illustrated that EWB could increase life satisfaction if it is perceived by farmers at the desired level. Although most of the EWB measures have been designed to be measured by quantitative studies and mathematical equations, it was found that these measures would affect life satisfaction if they were perceived by farmers. For example, income will affect the farmers` life satisfaction when it is perceived subjectively at an acceptable level by farmers. In other words, farmers' happiness and life satisfaction would be improved when they psychologically perceive that their OWB has been enhanced. This reflects the findings of Kelley and Evans (2017) that assumed that the relationship between happiness, income, and wealth was indisputable.

PSOWB constructs also was found as the second predictor of life satisfaction. Therefore, farmers' perception of their social needs fulfillment plays a significant role in their life satisfaction. It means that education could increase life satisfaction if the farmer feels that his/her education level is appropriate. In other words, the farmers perceive that their life satisfaction would be increased when their SOWB improves.

It is suggested that POWB in conjunction with OWB is essential to present a realistic assessment of HWB. In fact, HWB will be raised while OWB construct mentally is felt by farmers on a desirable level. Therefore, HWB is a psychological concept, which has been established based on Maslow's motivation theory (1943). The findings also showed that although OWB could be evaluated by quantitative methods, this concept could be perceived subjectively by farmers, while OWB can be assessed based on individual perception and finally affect life satisfaction and happiness. As past studies emphasized the important role of OWB on SWB (Costanza *et al*., 2007; Kelley and Evans, 2015; O'Donnell and Oswald, 2015; Owen and Phillips, 2016; Sánchez *et al*., 2017; Satici, 2016). The results revealed that HWB can be measured by OWB and SWB, however, the measuring methods should be the same. Therefore, the OWB state of farmers could be investigated, while attention should be paid to their attained economic, social, and environmental needs from farmers' perspective. As a result, it is necessary to measure OWB by individual self-evaluation, which is conducted at the same level. Indeed, SWB is a mental concept based on farmers feeling while OWB is obtained based on macro data sets, so, it is possible that OWB is not associated to SWB. OWB also outlines farmers need, however, it has been estimated by different methods. Our findings illustrated that OWB measures could be desighned similar to SWB measures if OWB constructs are defined based on farmers perception.

This paper discusses the assumption that there is a relationship between OWB and SWB measures. The findings illustrate that understanding HWB among farmers needs to be detected based on their feelings for not only SWB but also OWB constructs. Four main conclusions have emerged. First, HWB is a psychological concepts based on the farmers' perception about their needs. Therefore, although OWB may present HWB quantitatively, farmers' perception of this concept may display a real picture of HWB. Second, the relationship between SWB and OWB could be demonstrated if OWB domains are measured based on Maslow's motivation theory. Third, it was found that EWB, measured broadly in previous studies, plays a main role in happiness and life satisfaction if it is measured based on farmers understanding of HWB structures. Fourth, HWB is more a psychological concept rather than a quantitative one, which can be shown based on individual perception rather than only by quantitative indicators.

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گذار از بهروزی عینی به بهروزی ذهنی انسانی در ارزیابی کیفیت زندگی کشاورزان؛ کاربرد رهیافت اپیستمولوژی نوین در میان برنجکاران ایران

م. محمدرضایی، م. چیذری، ح. صدیقی، و م. محمودی

چکیده

بهروزی انسانی یکی از اهداف اصلی توسعه پایدار روستای است. در واقع، بهروزی انسانی کیفیت زندگی جوامع روستایی را نشان می‌دهد. این مفهوم دو حیطه بهروزی عینی و زهنی را شامل می‌شود.

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اگرچه، به طور منطقی چنین فرض می‌شود که بهروزی عینی در ارتباط با بهروزی ذهنی است، اما این رابطه در مطالعات پیشین کاملا تایید نشده‌است. سه دلیل اصلی نظیر، سطح جغرافیایی متفاوت در تحلیل‌ها، نوع داده‌ها و منطق اپیستمولوژی متفاوت، تحلیل‌های بهروزی انسانی عینی را از بهروزی انسانی ذهنی جدا ساخته‌است. این مطالعه در سطح یکسان از نظر داده، سطح جغرافیایی و فلسفه اپیستمولوژی برای بررسی رابطه بین بهروزی عینی و ذهنی در میان برنجکاران استفاده‌نمود. پیمایش با استفاده از ابزار پرسشنامه برای جمع‌آوری داده‌ها استفاده شد. نمونه‌گیری خوشه‌ای دو مرحله‌ای تصادفی با استفاده از مصاحبه حضوری از ۳۸۴ شالیکار در اصلی‌ترین منطقه کشت برنج ایران اجرا شد. نتایج حاصل از مدل معادلات ساختاری نشان داد که بهروزی اقتصادی، اجتماعی و محیط زیستی درک‌شده توسط شالیکاران به طور معنی‌داری بر جنبه بهروزی ذهنی (شادی و رضایت از زندگی) اثر می‌گذارد. در واقع، شادی و رضایت از زندگی شالیکاران زمانی تغییر می‌کند که جنبه های عینی بهروزی انسانی به صورتی ذهنی توسط آنها درک شود. بنابراین، بهورزی عینی انسانی می‌تواند بر بهروزی ذهنی اثرگذار باشد، اگر جنبه‌های بهروزی عین بر مبنی ارزیابی ذهنی کشاورزان سنجیده‌شوند.

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