



Multidimensional well-being of residents affected by the Pak Mun Dam, Thailand

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ABSTRACT

Understanding the effects on the overall well-being of the communities affected by the Pak Mun Dam construction would fill in the gaps in existing knowledge and facilitate a deeper discussion of the factors that impact overall wellbeing. The Pak Mun Dam was finished in 1994 and from that point on there have been changes affecting local residents. This study attempts to understand the impact of those changes from a well-being perspective using primary data collected from residents in villages close to the dam site. Structural Equation Model (SEM) was method for this research analysis. Results from a structural model show that social and economic well-being are important factors that impact the overall well-being of the affected residents from the Pak Mun Dam area. Furthermore, we discuss how information from 20 items within seven dimensions of the well-being measurement model can be used to develop more efficient strategies and policies to increase well-being capital.

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Introduction

The Pak Mun Dam in Thailand is a controversial dam with a long history of resident protest. It is located in the Mun and Chi River basins at Ban Hua Heo village in the Khong Jiam district in the Ubon Ratchathani province of Thailand. The main reasons for constructing the dam were to increase hydropower and irrigation in the Khong Jiam district. The dam was funded in part by the World Bank (2000) with a loan of US\$25 million as part of a total cost of US\$250 million.

After the dam was completed in 1994, many residents were relocated as there were many changes that impacted their livelihoods and structural foundations of local communities. There is evidence that the livelihoods of many residents have permanently changed. For example, income and fish production have decreased by 20–40% since the dam became operational (Manorom, 2006). Furthermore, community well-being has been impacted as younger people moved to cities to find employment to support their families (Amornsakchai et al., 2000). Environmental well-being is another important concern since 96 (37.5%) of 265 species of fish have disappeared from the region entirely (Manorom, 2006). Many of these fish were part of the economic and cultural life of the villagers. Cultural well-being has changed as about 50 rapids, which were considered “sacred” by local communities, are now underwater. Job well-being has been impacted as people adjust to working new jobs that are different from their previous work in the fishing sector. The people in close proximity to the dam were the most impacted. We refer to these communities of people as “affected”.

To date, the livelihood of the affected communities has not improved, so requests to open the dam for longer periods or even permanently have continued. More information on the factors and decisions impacting the well-being of affected communities would provide important information to both public and private stakeholders for creation of effective policies and strategies to improve people’s livelihoods.

This study aims to understand the impact of those changes from a well-being perspective using primary data collected from residents in villages close to the dam site. Structural Equation Model (SEM) was method for this research analysis.

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Literature review

Well-being dimensions and overall well-being

Well-being measurement incorporates many categories. Some examples include United Nations Development Programme (UNDP)'s human development index (HDI) which evaluates long life and health, knowledge, and a decent standard of living (income). To better understand overall well-being, a multidimensional model of well-being would provide more information about total well-being. Furthermore, a well-being index would provide a better understanding of people's general well-being, and this number could be used to evaluate well-being over time.

Many studies have used different methods to weight each well-being dimension. One method uses equal weighting (Chowdury & Squire, 2006). Others have argued that better results are obtained when the weight is based on the well-being that was selected the most. (Mahlberg & Obersteiner, 2001; Despotis, 2005). Di Tommaso (2006) used statistical weighting, which is based on a structural equation model (SEM) and combines multiple items that correlate with one another within the same factor using confirmatory factor analysis. A final method uses regression weighting, which is similar to SEM. This method combines similar characteristics into the same factor but separates them as individual variables, which can eventually cause a multicollinearity issue (Schokkaert, 2007). The weights used in a well-being index would help illustrate the importance of each dimension to overall well-being. This helps us understand the importance of each dimension in a sustainable livelihood context, with the overarching objective of achieving economic well-being while also enhancing social well-being and environmental well-being. Understanding the importance of each dimension can lead to a more sustainable development paradigm. The different dimensions of well-being include economic, community, environmental, health, political, cultural, jobs and family (Sterling E, et al. 2020) Each well-being dimension has its own set of indicators that make up the composite dimension value. Different researchers may select different indicators to include in a dimension. For example, economic well-being (EWB) includes the indicators of income (Smith & Summers, 2011), economic insecurity, which includes low savings and debt (Osberge & Sharpe, 2003), and household production, which is important to the economic security of the family. Prawitz et al. (2006) measured feelings of worry about one's economic condition as a subjective well-being indicator for EWB.

For community well-being (CWB), Cahyat, Gönner and Haug (2007) measured the feeling of being part of a community, which is called a social relationship. In a slightly different take on the same thing, Smith and Summers (2011) measured social cohesion, which includes the feeling of being connected and sharing the same interests. An indicator of social participation was included in CWB by Knight and Gunatilaka (2012). Another CWB indicator, social trust, describes how community members trust one another in society (Woolcock, 2001). Finally, safety, security, and/or freedom from harm were added as indicators of CWB which can be represented by crime rates (Rahman et al., 2003).

Environmental well-being (EWB), one of the three main pillars for a sustainable livelihood, can be measured through biodiversity (Smith & Summers, 2011) and the quality and condition of land and water (Cahyat et al., 2007). Temperature level is also a factor as climate change progresses (Rishi & Khuntia, 2012). Beside the condition of the environment itself, the programs or services related to environmental protection and improvement are also used as indicators of EWB (Murphy, 2010).

Health well-being (HWB) indicators measures both mental and physical conditions. It includes self-reported data regarding the frequency of exercise, smoking, and consumption of fruits and vegetables (Smart & Sanson, 2005). Depression and mood disorders are additional subjective measurements of HWB (Keyes, 2006).

Political well-being (PWB), it indicates whether people have the capacity to request freedom and equal treatment (Deueulin & McGregor, 2010). Additionally, governmental effectiveness, corruption level, and voice and accountability are important factors for measuring PWB (Knight & Gunatilaka, 2012). Finally, another basic factor is the government's ability to provide basic services (Cahyat et al., 2007).

Cultural well-being (CWB) addresses the identity of the community, and it is part of people's everyday lives. It develops from generation to generation and represents the pride of the community. Indicators measuring CWB include cultural participation and cultural involvement, exemplified by such factors as event participation. Furthermore, a feeling of belonging and sense of pride in tradition and heritage are important indicators for CWB (Collier et al., 1997).

Job well-being (JWB) involves having employment that provides many positive mental benefits such as self-esteem. There are many indicators used to measure JWB such as perceptions of working conditions, feelings of self-esteem and self-worth, and a sense of belonging in the workplace (Turner & Zacharatos, 2002).

Family well-being (FWB) concerns the family as the smallest but most important unit in society which provides a strong foundation for community. Good emotional and physical care and support shape individuals and can make them a better person in society. Martinez and Forgatch (2002) mentioned parenting as an important factor for measuring FWB. The Circumplex Model of Marital and Family Systems (Olson, 1999) expresses the importance of family cohesion, emotional bonding, and family flexibility to FWB. Furthermore, the McMaster Model of Family Function (Epstein, Bishop & Levin, 1978) mentioned problem solving and communication among family members, family roles, and affective responsiveness as indicators of FWB.

What all the above have in common is that they can measure how people fare when changes occur that affect their quality of life. As a value neutral measurement, wellbeing models are designed to measure lifestyle changes resulting from some form of development. Some of the indicators measure direct changes to ones' wellbeing status (e.g., income) while others measure more subjective changes (e.g., family cohesion). Another characteristic that wellbeing factors have in common is that they are determined by the people who are affected by whatever change has occurred. This paper discusses how factors of well-being, such as those elucidated above, react to change.

Research and Methodology

Goal of the study

This study aims to identify the items (i.e., factors) embedded within each well-being dimension and evaluate the effect on those factors making up the well-being dimensions with a goal of determining how they all impact overall well-being. To achieve this goal, a thorough review of the literature was conducted to identify well-being indicators, including which well-being dimension they primarily belong to. The review resulted in a set of forty indicators (Table 1), making up eight well-being dimensions, that were used to assess the well-being of affected residents. Affected residents were those deemed to be impacted by the construction of the Pak Mun dam in Thailand. Operationalizing the forty indicators required the construction of Likert type scale questions which were then answered by a sample of affected residents. Their answers were used to measure the indicators and determine if they had any saliency within a particular well-being dimension. Participants responded to each indicator using a scale that went from 1-5 with 1 indicating the lowest level of agreement and 5 the highest level of agreement. Since there were 40 items, eight well-being dimensions, and one dependent variable (overall well-being), structural equation modelling (SEM) was deemed the most appropriate method for this study because it allows for measuring the effects of multiple independent variables (exogenous variables).

Table 1: Well-being dimensions.

Well-being dimension	Items
Economic well-being (EWB)	<ol style="list-style-type: none"> 1) Level of financial stress 2) Satisfaction with financial situation 3) Feeling about the current financial condition 4) Inability to afford going out 5) Living paycheck to paycheck 6) Worry about living expenses 7) Confidence regarding financial emergencies (finding baht 1,000) 8) Stress about finances in general
Community well-being (ComWB)	<ol style="list-style-type: none"> 1) Social acceptance 2) Social integration 3) Social assistance 4) Safety of the community 5) Satisfaction with community well-being
Environmental well-being (ENWB)	<ol style="list-style-type: none"> 1) Water purchasing 2) Availability of water 3) Fish quality (taste) 4) Crowdedness 5) Environmental satisfaction based on water quality 6) Environmental satisfaction based on fish quality
Political well-being (PWB)	<ol style="list-style-type: none"> 1) Trust in central government 2) Trust in local government 3) Satisfaction with government services 4) Satisfaction with local government services 5) Government respect of the voice of the local residents
Health well-being (HWB)	<ol style="list-style-type: none"> 1) Number of hospital visits 2) Stress and pressure 3) Energy level 4) Sleeping difficulty 5) Health satisfaction
Job well-being (JWB)	<ol style="list-style-type: none"> 1) Hours of work (workload) 2) Pride in current job 3) Job fit 4) Job satisfaction
Cultural well-being (CWB)	<ol style="list-style-type: none"> 1) Children's understanding of local culture 2) Community integration 3) Self-understanding
Family well-being (FWB)	<ol style="list-style-type: none"> 1) Time spent with family 2) Family help 3) Emotional support 4) Overall family relations

The benefit of SEM is that it can be used to study the relationships among latent constructs that are indicated by multiple measures (Lei & Wu, 2007). SEM is a flexible method by which many tasks, such as multiple regression and factor analysis, can be performed at one time. SEM implies a structure for the covariance of observed variables which is known as the covariance structure model. Furthermore, SEM analyses are based on previous theoretical hypothesis testing from studies where theory was fitted with the data. For this study, a multidimensional model of well-being was developed using the sustainability concept. Sustainability consists of three dimensions that are based on achieving the three pillars principle of economic, social and environmental gain, or no net loss, after change has occurred. In this study, social well-being is very broad which includes many dimensions such as community, political, family, job and cultural dimension so that these five social scope dimensions were studied to estimate for second order factor of social well-being.

The SEM combines two models, the measurement model and the structural model, to conduct what is known as confirmatory factor analysis (CFA). CFA was used to measure the direct impact of unobserved variables on each well-being domain based on their observed indicators in the measurement model. Based on theories and the results of hypothesis testing from previous studies, the measurement model indicated which well-being dimension (latent variable) was measured by each of the 40 indicators, allowing the assessment of the relationship of each indicator to its respective well-being domain. Indicators that did not produce statistically significant relationships were removed from the measurement model. All indicators that had statistically significant relationships with their respective latent variable had to meet several additional criteria to be retained: a factor loading of at least 0.7, an average variance extracted (AVE) of at least 0.5, and a composite reliability (CR) of at least 0.7.

The structural model defined the relationship of each latent variable (well-being dimensions) to the dependent variable, overall well-being. The estimated coefficient from this structural model indicates the impact of each well-being dimension on overall well-being. The process of testing the model fit of the structural model is similar to that of the measurement model and is based on the following criteria for the goodness-of-fit indices to be considered a good fit to the data: a root mean square error of approximation (RMSEA) of no more than 0.05 (reasonable fit: $0.05 < \text{RMSEA} < 0.08$; MacCallum, Browne, & Sugawara, 1996), a comparative fit index (CFI) of at least 0.90 (Hu & Bentler, 1999), a standardized root mean square residual (SRMR) of no more than 0.08, and a minimum discrepancy divided by its degree of freedom (CMIN/df) of no more than 5 (Marsh & Hocevar, 1985).

A list of villages thought to be affected by the Pak Mun Dam was created based on a study by Phongam (2005). Two villages in the Khong Jiam subdistrict, Hua Hew village and Hua Hai village, were selected for collecting primary data from residents because they are located close to the Pak Mun Dam. Hua Hew village, especially, was thought to be severely affected by the dam. At the time of the study, the Khong Jiam subdistrict had 1,992 households and 6,359 people. Hua Hew village had 301 households with a population of 933, and Hua Hai Pattana village had 131 households and a population of 505. SEM requires a sample size of at least 200 subjects (Hooper, Coughlan, & Mullen, 2008). For this study, 250 affected residents were interviewed.

Training for survey staff

Five college students were hired from Ubon Ratchathani Rajabhat University to administer this study and underwent one day of training before the survey was conducted. The training covered the process of introducing themselves and asking participants for their permission to participate in the survey. They were also tasked with reading each potential respondent a statement of consent, which allowed interview subjects to stop the survey at any time. The survey staff interviewed the head of the household or the spouse of the head of the household within each selected family group.

The survey staff read the survey aloud to residents and assisted in writing answers. Each survey took about half an hour to complete and was conducted inside the participant's home because many of the sensitive questions such as those regarding their political well-being were carefully addressed in order not to reveal political leanings to those not involved in data collection. A nominal gift (a Thai dessert) was used to motivate residents to participate.

Results

For the original measurement model, the AVE of ComWB, ENWB, and HWB were lower than the criterion value of 0.5, an indication that the indicators do not correlate well with these latent variables (see Table 2). Furthermore, the CR for ComWB, ENWB, and HWB were less than the criterion value of 0.7, another indication that the items within the same latent variable do not correlate well with one another. Moreover, the model fit indices for the original measurement model (Table 3) did not indicate a good fit because while the minimum discrepancy divided by degree of freedom (CMIN/df) is lower than 5.00 and the RMSEA is considered reasonable, the comparative fit index (CFI) is lower than 0.9, and the SRMR is much higher than 0.08, both of which indicate a poor fit. It was decided to try eliminating one factor, HWB, which had low AVE and CR values in the original model. In addition, 20 indicators for the dimensions that remained in the measurement model were eliminated because of factor loadings less than 0.7. The AVE for the modified measurement model improved as well as the AVE and CR for ENWB (see Table 2). ComWB still had a low AVE and CR in the modified model, but it was retained because it is one of the important factors for SW and the two indicators for ComWB had high factor loadings. The AVE and CR for all other factors in the modified model remained greater than the respective index criteria.

Table 2: AVE and CR values for each factor in the original and modified measurement models.

Factor	Measurement Model			
	Original		Modified	
	AVE*	CR*	AVE*	CR*
EWB	0.605	0.828	0.562	0.836
ComWB	0.424	0.530	0.374	0.540
ENWB	0.338	0.462	0.549	0.708
PWB	0.573	0.726	0.678	0.808
HWB	0.390	0.477	–	–
JWB	0.644	0.773	0.679	0.861
CWB	0.759	0.803	0.577	0.803
FWB	0.709	0.802	0.503	0.801

* AVE = average variance extracted; CR = composite reliability

Table 3: Model fit indices for original and modified measurement models.

Index	Measurement Model	
	Original	Modified
RMSEA	0.071	0.062
CFI	0.724	0.926
SRMR	0.100	0.060
CMIN/df	2.030	1.797

The CFA model consisted of 20 items grouped into seven well-being dimensions. The results for the measurement model are shown in Table 4. All standardized factor loadings are greater than 0.6 with the exception of the Community participation indicator for ComWB. All of the factor loadings that were free to vary had statistically significant loadings on their respective well-being dimension. The t-value of 1.00 for some items were set to 1 in order to identify the model. Table 5 reports results for the measurement model that treated the first-order factors of ComWB, PWB, JWB, CWB, and FWB as indicators of the second-order factor of social well-being (SWB). The standardized variance of FWB was set to 1 to define the model. All of the second-order factors that were free to vary had statistically significant loadings on SWB.

Table 4: Standardized factor loadings for indicators of the seven well-being dimensions in the CFA model.

Dimension	Indicator	Loading	SE	t-value
EWB	Feeling about current financial condition	0.722**	0.096	9.951
EWB	Level of financial stress	0.759**	0.105	10.305
EWB	Worry about living expenses	0.603**	0.093	8.411
EWB	Stress about finances in general	0.771	1.000	1.000
ComWB	Community participation	0.535	1.000	1.000
ComWB	Help from community members	0.662**	0.214	5.046
ENWB	Level of satisfaction with the water quality of Mun River and Mae Khong River.	0.710	1.000	1.000
ENWB	Level of satisfaction with the fish quality in the Mun and Mae Khong Rivers.	0.738	1.000	1.000
Political	Overall satisfaction with local government	0.876	1.000	1.000
Political	Trust in the local government	0.742**	0.120	7.265
Working	Pride in one’s job	0.696**	0.055	12.005
Working	Job fit with skills, knowledge, and experience	0.852**	0.063	15.266
Working	Satisfaction level with job	0.922	1.000	1.000
Culture	Children’s understanding of the importance of visiting the temple	0.646**	0.143	8.357
Culture	Feeling of closeness with the community	0.753	1.000	1.000
Culture	Understanding of the importance of visiting the temple	0.747**	0.112	9.105
Family	Increased time spent with family during the past 10 years	0.671**	0.161	7.877
Family	Willingness of individuals to turn to one another for help when something is troubling them	0.644**	0.133	7.656
Family	Ability to seek emotional support from family members when it is needed	0.727**	0.146	8.262
Family	Overall score of family relationship	0.638	1.000	1.000

**p < .01

Table 5: Standardized loadings of first-order factors on the second-order factor of social well-being (SWB).

First-order factor	Loading	SE	t-value
ComWB	0.511**	0.274	3.886
PWB	0.561**	0.213	5.459
JWB	0.517**	0.206	5.416
CWB	0.507**	0.170	4.885
FWB	0.691	1.000	1.000

** $p < .01$

Hypothesis testing and structural model

Turning to structural components, there are three exogenous (independent) variables (EWB, SWB and ENWB) and one endogenous (dependent) variable, which is Overall well-being (OWB). SWB is a second-order factor which has first-order factors of ComWB, PWB, JWB, CWB and FWB as indicators. Among these three independent variables, not all of the hypothesized direct effects on the dependent variable of overall well-being were statistically significant at $p < .01$. As mentioned earlier in the methodology section, the bootstrapping method was used to address the problem of nonnormality. The results in Table 6 report the confidence interval (CI) limits and the p -value.

Only two hypothesized direct effects were statistically significant at $p < .01$: EWB and SWB (see Table 6). The standardized loading for EWB indicates that a one standard deviation increase in economic well-being is associated with a 0.306 standard deviation increase in overall well-being. Similarly, if SWB were increased by one standard deviation, a 0.921 standard deviation increase is expected in overall well-being. In contrast, there is not strong statistical evidence that changes in ENWB are associated with changes in overall well-being. The RMSEA (0.069) and CFI (0.86) were just outside the acceptable ranges for indicating a good fit to the data, whereas the SRMR (0.076) and CMIN/df (2.123) indicated a good fit.

Table 6: Standardized factor loadings for the structural model.

Factor	Loading	SE	Confidence Interval		p-value
			Lower	Upper	
EWB	0.306	0.113	0.402	0.524	0.011
SWB	0.921	0.507	0.581	1.908	0.002
ENWB	-0.198	0.186	-0.612	0.006	0.108

Figure 1 presents the full path diagram for the combination of the modified measurement model and the structural model.

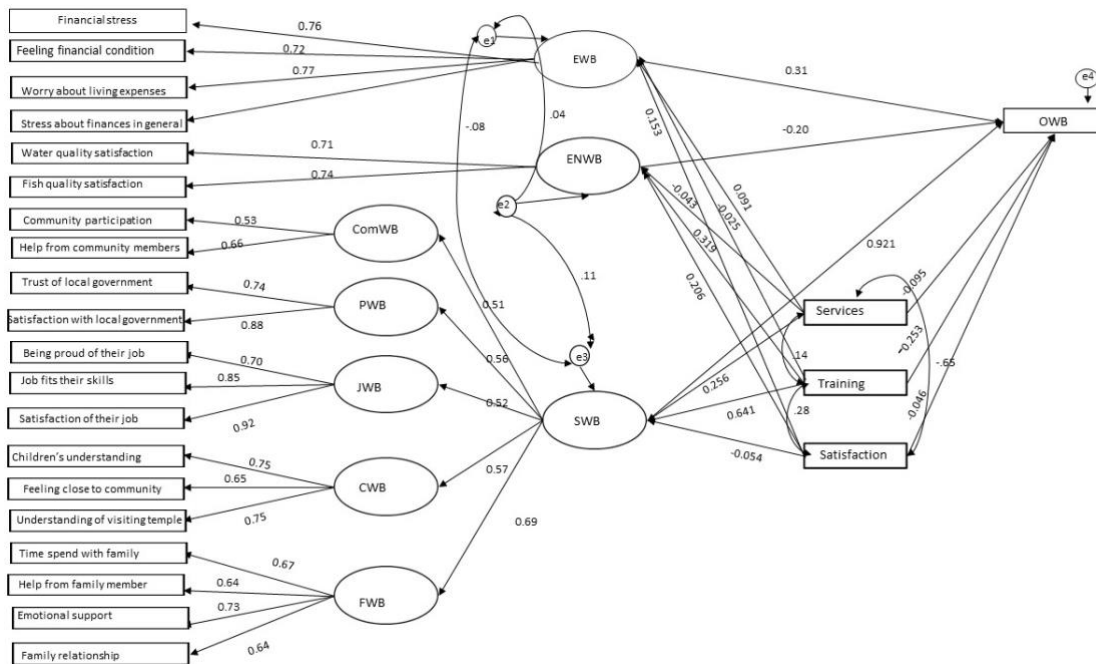


Figure 1: Path diagram.

Discussion

Seven well-being dimensions and their impact on OWB

As seen in both the literature and news reports, residents have claimed that the changes caused by the Pak Mun Dam have significantly and negatively altered their livelihoods. The negative effects include economic, environmental, and cultural factors as well as working conditions and family changes. The well-being dimensions that have significantly affected OWB are found in the structural model results based on the multi-regression analysis. The path model developed in this study has some implications that can be used by government decision makers to address these negative effects.

Sustainability

The results show that only two dimensions (economic and social) have a statistically significant impact on OWB.

EWB. The EWB dimension is important for sustainable development based on previous news stories about this affected community. The affected community residents have mentioned loss of income as one of their main concerns. They have requested more financial support from the government to make up for their losses in the form of monetary compensation and land. They have also requested changes to the dam operation so that they may return to their previous occupations as commercial anglers.

The EWB dimension has a positive relationship with overall well-being. The EWB items in the analysis show that community members were worried about their financial condition resulting from the dam's completion. Such significant changes affected their livelihoods to the extent that they did not have sufficient income to support their families. Without a permanently open dam, they seem unable to earn sufficient income or have enough money to purchase food. This has resulted in the younger generation's having to move to cities to find jobs. These changes have ultimately had an impact on SWB, which is one of three pillars of sustainability.

SWB. SWB is an important factor in that the affected community residents have claimed that their livelihoods changed following the completion of the Pak Mun Dam. SWB combines all social-related dimensions, including FWB, ComWB, CWB, JWB, and PWB. The standardized estimates or loadings are all statistically significant relative to SWB. The results show that SWB has a positive impact on OWB. Based on the estimated positive effect of SWB and EWB on OWB, in order to increase OWB, it is important to increase the capital of all items within the first-order factors of CWB, ComWB, PWB, JWB, and FWB, as well as the items within EWB. Based on the 14 items within the five dimensions of SWB, the following is a summary of how each item relates to the current situation.

For ComWB, community participation and help from other community members play important roles in. The communities were separated from the original community because the land they received as compensation for the occupation losses (i.e., commercial fishing) was redistributed by the government. Affected residents did not choose the land they thought most beneficial to compensate them for occupational changes. Furthermore, community members' incomes were much lower than before, and this was one of the main concerns and the reason for the change in livelihood both socially and environmentally. The individual concerns of each family regarding economic hardship could be one of the weaknesses of the community, as evidenced by the difficulty for community members to assist one another.

Based on the results for CWB, community members' understanding of their culture, traditions, and the meanings of their traditional activities played an important role. Many traditions for these communities, such as the Thai New Year, relate to the river, and this area was considered the sacred area of the Chao Mae Prapru for this community (Phongam, 2005). After dam construction these sacred areas were underwater. Policy makers should consider the importance of these factors before enacting policies that affect community residents because the indicators that measure understanding of culture and traditions have high loadings relative to CWB and CWB has a statistically significant loading on the second-order factor of SWB.

Regarding PWB, trust in and satisfaction with the local government were important items for this subfactor probably because the local government was very close to the community. The local government would be the first point of contact for the affected community because of close ties and the fact that the government had been with them since the beginning of the problem. Local government officials knew all about the communities, the community members, and the overall background and issues affecting residents. The results show that PWB has a positive impact on SWB. Local government could act as a mediator between the affected communities and central government because they would understand the local communities' issues. However, during interviews, we found that many people did not feel that local governments provided sufficient assistance to the communities or, in some cases, no assistance was provided at all. Although some local governments provided training for jobs in affected communities, there was still a perceived lack of help in many villages.

FWB relates to family relationships. Younger generations had to move to cities to find better jobs, negatively impacting families, who spent less time together and received less help and emotional support than families in unaffected communities. All four indicators of FWB had high loadings and FWB also had a statistically significant loading relative to the second-order factor of SWB. Family change was an issue that affected the communities with regard to the effects of the Pak Mun Dam on their livelihoods.

The three indicators of JWB are related to job pride, skills, and satisfaction. Results indicate that people in the affected communities are not satisfied with their current work situations as their current jobs do not relate to fishing, which was their previous livelihood. Community members also claimed that the career changes resulted in a loss of culture in the community.

The results show that both EWB and SWB are important factors impacting the real well-being of the affected communities from the Pak Mun Dam area. Even though it has been alleged that the affected residents just want to get more compensation from the government, the results show the importance of SWB to peoples' perceived quality of life. This is supported by a standardized estimate value of SWB which is much larger than that of EWB with respect to an overall positive impact.

Conclusion

After 26 years, many local communities who experienced a negative impact from the Pak Mun Dam project still need help from both public and private stakeholders. Much information about the long-term impact is needed to provide more appropriate policy. The results of fitting the structural model helps us to understand the importance of economic well-being and social well-being in relation to overall well-being. The results also revealed important information regarding the items within these significant well-being dimensions. The standardized estimate of social well-being is higher than those of economic well-being, demonstrating that social well-being had a greater impact on overall well-being. Regarding factors that affect a sustainable livelihood, environmental well-being should be a significant dimension. However, environmental well-being is not statistically significant in this model. This may be due to indirect versus direct reasoning. People may focus on one dimension such as economic well-being but ignore that environmental well-being brings them economic well-being. Without the fish being there to be caught and consumed or sold, economic well-being suffers. The environmental change represented by environmental well-being may not be fully internalized regarding its direct effects on economic well-being. The items within the five dimensions that are statistically and significantly impactful to social well-being ultimately impact overall well-being. To be able to increase social well-being and economic well-being and eventually overall well-being, it is important to increase the capital through these items. Stakeholders, including the central and local governments, must consider these as important factors in order to solve targeted issues with appropriate solutions.

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