



Reliability of Indicators Measuring Early Childhood Education for Sustainability: A Study in Turkey Using Generalizability Theory

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Abstract

Integrating basic principles, values, and practices of education for sustainability in early childhood education (ECE) is important for developing and developed countries. In this context, there is a need to identify and evaluate indicators that measure sustainable practices in ECE programs. This study was conducted in 18 preschools in Turkey to provide statistical analyses of the sustainability indicators. OMEP Environmental Rating Scale for Sustainable Development in Early Childhood with three subscales for sustainability (economic, environmental, and sociocultural) was utilized as the data collection tool. The reliability analyses are framed on generalizability theory, which identifies the sources of variation across schools, raters, and indicators on the three subscales. The study finds that the sustainability indicators can be redefined and adapted to be employed in the Turkish context as a way to ensure more reliable measurement of sustainability practices in early childhood education settings.

Keywords Education for sustainability · Early childhood education · Generalizability theory · Environmental Rating Scale

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Résumé

L'intégration de principes, valeurs et pratiques relevant d'éducation au développement durable (EDD) en éducation de la petite enfance (ÉPE) est importante dans les pays développés et dans les pays en développement. Dans ce contexte, il est nécessaire d'identifier et d'évaluer les indicateurs mesurant les pratiques de développement durable dans les programmes d'ÉPE. Cette étude a été réalisée dans 18 maternelles de Turquie afin d'apporter des analyses statistiques sur les indicateurs de durabilité. L'outil de collecte de données utilisé est l'*Échelle d'évaluation de l'environnement pour le développement durable en éducation préscolaire de l'OMEP (ERS-SDEC)* à trois sous échelles (durabilité économique, environnementale et socioculturelle). L'analyse de fiabilité dans le cadre de la théorie de la généralisabilité identifie les sources de variations entre les écoles, les évaluateurs et les indicateurs aux trois sous échelles. Il est recommandé que les indicateurs de durabilité soient redéfinis et adaptés pour utilisation dans le contexte turc afin d'assurer une mesure plus fiable des pratiques de développement durable dans les contextes d'éducation de la petite enfance.

Resumen

La integración de principios, prácticas y valores básicos de la Educación Sostenible (EfS, *abreviatura en inglés*) en la Educación Preescolar (ECE, *abreviatura en inglés*) resulta importante para los países desarrollados y en vías de desarrollo. En este contexto, existe la necesidad de identificar y evaluar indicadores que midan prácticas sostenibles en los programas de Educación Preescolar. El presente estudio se llevó a cabo en 18 escuelas de preescolar en Turquía con el fin de brindar un análisis estadístico de los indicadores de sostenibilidad. La herramienta de medición de datos que se utilizó fue la Escala de Valoración Ambiental para el Desarrollo Sostenible en la Educación Preescolar de la OMEP (ERS-SDEC, *abreviatura en inglés*) con tres sub-escalas: sostenibilidad económica, ambiental y socio-cultural. El análisis de fiabilidad dentro del marco de la Teoría de Generalidad identifica las fuentes de variación en las diferentes escuelas, medidores e indicadores en las tres sub-escalas. Se recomienda redefinir y adaptar los indicadores de sostenibilidad al contexto de Turquía para así asegurar una medición más fiable de las prácticas de sostenibilidad en ambientes de educación preescolar.

Introduction

Sustainable development can be examined from different policy, research, and practice perspectives, including early childhood education. Sustainable development is defined as the manner in which current needs can be met while also taking into account the needs of future generations (Brundtland 1987) and is differentiated as three interrelated pillars concerned with environmental protection, social and cultural equity, and economic sustainability. Moreover, sustainable development focuses on the many challenges facing the globalized world, such as those associated with increasing environmental pollution, population growth, depletion of non-renewable natural resources, and social inequalities.

The environmental pillar of sustainability is about maintaining the viability of the natural world by using renewable resources, minimizing pollution, and protecting cultural and historical environments. Social and cultural equity considers the life quality of individuals, support for human rights and social justice, respect for cultural differences, and encouragement of cooperation and participation in decision-making between individuals and across societies. Economic sustainability takes into account the support for local economies, balancing of production and consumption, the minimization of gaps between the rich and poor, and the encouragement of ethical procurement and investment policies (UNESCO 2005). Considered from a holistic perspective, education for sustainability (Efs) has a vision, which respects the sociocultural values within different countries, places emphasis on environmental protection, and accounts for economic sustainability (Davis et al. 2009).

Sustainability and Early Childhood Education

Education has an important role in addressing what must be done to sustain the life opportunities for future generations. Efs aims to inform individuals about sustainable practices, raise awareness, and provide support for the development of necessary skills and attitudes. UNESCO (2007) emphasizes two main principles for the inclusion of sustainability within educational policies: increase in the quality of learning and specifically teaching about sustainability. Learning about sustainable development needs to be integrated into all education levels, starting in early childhood. From an early age, individuals need to develop attitudes and behaviors that support a sustainable future for all and to take an active role and responsibility for a sustainable world.

The sustainable development goals endorse the importance of early childhood educational policies (United Nations 2015). Attention to these policy goals should occur at all levels of education from early childhood teacher education to the actual delivery of early childhood education programs. Pramling Samuelsson (2011) identified that addressing sustainability in early childhood education can be related to themes such as biodiversity, recycling, alternative energy, saving water, environmental protection, sustainable production and consumption, accountable citizenship, peace education, cultural diversity, gender equity, and social justice.

In many of the developing and developed countries, one of the most important goals of the education system is to include basic principles, values, and practices of education for sustainability into their current education processes by using holistic approaches. When current education practices for sustainability in early childhood are analyzed, many countries implement project-based studies on environmental sustainability for short periods of time but maintaining this focus while addressing how education programs for sustainability can be broadly implemented is limited. Integrating sustainability practices into early childhood education around the world requires the integration of important social and cultural elements, for example, more attention to social justice, racial equality, multiculturalism, multilingualism, and gender equality is necessary (Siraj-Blatchford and Pramling-Samuelsson 2016).

Even though EfS in early childhood has been emphasized in many international reports (Pramling Samuelsson and Kaga 2008; UNESCO 2005, 2008), adequate information about how the three pillars of sustainability can be implemented and evaluated in education programs has not been well developed. It is important to know how to measure reliably the progress in the implementation of sustainability practices so that the effects of these efforts are transparent. Measurement tools that are available to evaluate elements of sustainability, especially in early education environments, are limited. Furthermore, the development of quality measurement tools focusing on the environmental, sociocultural, and economic pillars of sustainability in early childhood education environments is needed.

Turkish Context and EfS in Early Childhood Education

During the implementation of sustainability practices in early childhood education in Turkey, the environmental and economic pillars are frequently identified. However, the sociocultural pillar of sustainability is rarely discussed (Kahriman-Öztürk et al. 2012). For example, Korkmaz and Güler Yildiz (2017) investigated preschool education environments in a study that focused on an eco-schools program that dedicated attention to the environmental and economic dimensions of sustainability. Kahriman and Olgan (2018) also examined characteristics and teacher practices evident in eco-focused and non-eco-preschool education institutions with regard to sustainability. These researchers reported that eco-focused preschools placed greater attention on environmental actions and artifacts as elements of sustainability, compared to non-eco-focused institutions. The researchers identified that physical enablers of sustainability including the use of recycling bins or using books about cultural diversity encouraged teachers to engage in associated sustainability activities. Kalaitzidis (2012) and Henderson and Tilbury (2004) identified that the physical environment provides many facilitating opportunities for sustainability practices.

In order to support the greater integration of sustainability practices into early childhood education in Turkey, several important steps are needed. The first step is to provide the necessary physical conditions that are in harmony with sustainability principles. Examples include providing alternative energy sources; using recycled products; using electronic devices with high efficiency energy classifications; minimizing use of books or toys that show gender, ethnic, lingual, and religious stereotypes; and role-modeling to promote positive attitudes and behaviors for sociocultural sustainability. Words and concepts about sustainability (e.g., saving, cultural diversity, biological diversity, and sustainable production) can be introduced and integrated into learning activities. It is important to integrate these practices in a comprehensive way into current programs. For example, frameworks that operationalize practices for each of the pillars of sustainability can be used (Duncan 2011; Engdahl and Rabušicová 2011), such as the elements of: reduce and reuse for the environmental pillar; recycle and redistribute for the economic pillar; and respect-reflect and rethink for the sociocultural pillar.

The Current Study

There is a need to investigate progress in implementation of EFS practices in early childhood education in different countries, which can also be used comparatively across countries. The OMEP Environmental Rating Scale for Sustainable Development in Early Childhood (ERS-SDEC) was developed for this purpose.

The ERS-SDEC was originally designed and developed in an international research project that included the participation of Turkey. Sets of indicators about sustainability practices related to the three pillars of sustainability were identified and discussed in the workshops organized in three different countries. Common points of views about the sets of indicators to be included in the scoring scale were identified. Ten countries participated in the project and provided feedback on the scale after research trials were carried out in the different countries. Reliability and validity studies were completed separately in a number of countries (Haktanır et al. 2012; Hesterman et al. 2015; Siraj-Blatchford et al. 2013).

This current research conducted in Turkey expands the previous research by examining the reliability of the OMEP Environmental Rating Scale for Sustainable Development in Early Childhood (ERS-SDEC) in a comprehensive way using generalizability theory. This scientific endeavor can support the further development of reliable measurement of sustainability. The findings can be used to monitor the implementation of sustainable practices in preschool classrooms in Turkey. This is an important step to ensure that research evidence about how to measure sustainability is reliable and trustworthy. The research questions addressed are:

1. What are the predicted variance components for school, rater, and the sustainability indicators related to sustainability practices in preschools on the ERS-SDEC?
2. What are the reliability coefficients (G and Φ) for scores obtained on the ERS-SDEC?

Method

This research was conducted in 18 schools, which were located in Mersin, which is a province in southern Turkey, on the Mediterranean coast. Within each school, there were 5 to 10 preschool classrooms catering to children aged 3 to 6 years old. Each preschool had approximately 120 children enrolled, and there were 15 to 20 children in each classroom. Observations were completed in 18 preschool classrooms. All of the participating institutions were independent schools affiliated with the Ministry of National Education of Turkey. Convenience sampling was used to identify the schools and to select preschool classrooms. A time schedule was made available to the schools and teachers who were able to select a convenient time (2 h) for the researchers to visit and complete the ERS-SDEC observation schedule that became the primary data for the analyses.

Data Collection Tool and Scoring

The ERS-SDEC was designed to be used by individuals or groups of practitioners to review and rate their sustainable development curriculum and to guide practitioners and preschool managers in setting their priorities for curriculum development. However, external evaluators can also use this measure and may need to interview teachers and children to collect additional information to confirm the use of any practices that cannot be directly observed in a short period. Documents about curriculum, daily plan, schedule, and children's works may be examined to complete the ratings on the ERS-SDEC.

In the original development of the ERS-SDEC, sets of indicators were identified to describe curriculum and pedagogic provisions. Sustainability practices are observed and aligned to the indicators reflecting sustainability practices that are listed on the rating scale. On the original scoring system, these indicators were scored on a 7-point rating scale: Level 1 (inadequate); Level 3 (minimal); Level 5 (good); Level 7 (excellent). Interim points of 2, 4, and 6 are also identified on this scale. Observers first score the indicators at Level 1 (observed or not—yes/no). A rating of Level 1 must be given when any indicator is scored yes. A rating of Level 2 is given if all indicators at Level 1 are scored “no” but at least half of the indicators under Level 3 are scored “yes.” A rating of Level 3 is given when all indicators at Level 3 are scored “yes”; and so on.

The first trials of the Turkish Version of ERS-SDEC were conducted in five preschools through extended observations in different preschool classrooms and in-depth interviews with staff (Haktanir et al. 2016). The results of these trials indicated that the observed preschools were not able to meet most of the criteria in economic and sociocultural sustainability. For the economic dimension, many schools were found to be performing at inadequate and minimal levels. However, for the social and cultural dimension, some schools met requirements above “good.” As expected, highest scores were reported for the environmental dimension, in which schools achieved ratings of “good” (Level 5) or higher levels. However, in the current study, the scoring system of the original scale was revised in order to advance research on this measurement tool. This revision took into account that each indicator can make a difference (variance) to the score. Therefore, with the revision, each indicator scored and evaluated separately, according to the presence (1) or absence (0) of the measured feature.

Data Collection Process

Before starting data collection for this research, permission to conduct the research was requested from the Ministry of National Education with which the schools were affiliated. After receiving permission, administrators and teachers in the selected schools were provided with information about the project and the data collection process. Schools willing to participate in the research were confirmed by distribution and completion of voluntary participation forms. Parents in these schools were

informed about the data collection, and their consents were obtained to ask children questions about their school experiences that were related to information required to complete the ERS-SDEC.

Two researchers, who were experts in preschool education, during the 2017–2018 academic year, Spring semester, collected the data simultaneously. Each researcher scored each indicator on the ERS-SDEC independently. The researchers spent at least 2 h in each participating classroom observing the children and activities. The researchers did not talk with staff during the observational sessions or intervene in activities. After the observation session was completed, interviews were conducted with teachers, school administration, other staff or children for clarifying information about practices described on the indicators that could not be observed directly or in a short period. Field notes from the interviews were recorded on the evaluation form and were taken into account in making a final judgment on each item for each set of indicators on the three ERS-SDEC scales (economic sustainability, environmental sustainability, and sociocultural sustainability).

Data Analysis

Generalizability theory provides a comprehensive analytical framework to assess the reliability of measurement instruments (Brennan 2001; Güvendir and Güvendir 2017; Shavelson and Webb 1991). Cronbach and his associates (1972) developed generalizability theory (*G* theory). Generalizability theory enables greater understanding of the sources of variation in scores on any measure. Through analyses using generalizability theory, random or systematic “measurement error” can be estimated. This information can be used to design more efficient measurements on any measurement instrument. In these analyses of the ERS-SDEC, the analyses examined the variations in how sustainability indicators are scored, the variation between raters, and the variations in ratings between schools. Additionally, interactions between the sources of variability can be considered (i.e., variability in school–rater score, school–indicator score, and rater–indicator score).

The computer software used to conduct these analyses was Edu-G 6.00 (Cardinet et al. 2010). This analytic approach simultaneously examines all sources of variability in the ratings made by the observers (i.e., for 18 schools, 2 raters, and the sets of indicators for each subscale).

Findings

There were 18 schools who were scored independently on the ERS-SDEC by 2 raters on three subscales of the ERS-SDEC for: economic sustainability (17 indicators); environmental sustainability (15 indicators); and for sociocultural sustainability (16 indicators). The mean scores and standard deviations for the scoring of these indicators are presented in “Appendix.”

Estimation of Variance Components

There were seven variance components estimated to explain the effectiveness of the ERS-SDEC. In Table 1, the main effects (school, rater, and indicators) are explained by the percentages of the estimated variance components. The interaction effects (school \times rater; school \times indicator; rater \times indicator) also explain the percentage variations on these indicators for the estimated variances. Residual variance that was not accounted by either the main or the interaction effects is also included in Table 1.

Differences between school contexts should be the strongest component of variability to explain how schools differ in their use of sustainability practices. However, the estimated variance component for economic sustainability was only 4.4% of the total variance; 11% for environmental sustainability and 7% for

Table 1 Estimated variance components for school by rater by indicator design

Source	Sum of squares	df	Sum of squares	Est. variance component (%)	Standard error component
<i>Economic sustainability</i>					
School	10.56209	17	.62130	4.4	.00600
Rater	.05882	1	.05882	.0	.00020
Indicator	45.06209	16	2.81638	29.3	.02610
School \times rater	1.17647	17	.06920	.2	.00135
School \times indicator	68.93791	272	.25345	40.3	.01113
Rater \times indicator	1.44118	16	.09007	.7	.00169
Residual variance	16.32353	272	.06001	25.0	.00513
Total	143.56209	611		100	
<i>Environmental sustainability</i>					
School	13.01667	17	.76569	11.0	.00832
Rater	.22407	1	.22407	.3	.00069
Indicator	34.56667	14	2.46905	35.4	.02426
School \times rater	1.07593	17	.06329	.7	.00140
School \times indicator	34.90000	238	.14664	28.2	.00699
Rater \times indicator	.69259	14	.04947	.2	.00100
Residual variance	10.50741	238	.04415	24.3	.00403
Total	94.98333	539		100	
<i>Sociocultural sustainability</i>					
School	15.17535	17	.89267	7.0	.00913
Rater	.04340	1	.04340	.0	.00016
Indicator	19.91493	15	1.32766	11.5	.01268
School \times rater	1.30035	17	.07649	.1	.00160
School \times indicator	84.24132	255	.33036	52.1	.01492
Rater \times indicator	.70660	15	.04711	.0	.00097
Residual variance	18.44965	255	.07235	29.2	.00638
Total	139.83160	575		100	

sociocultural sustainability. Therefore, the sustainability score for each school on each subscale did not account for any substantial differences between schools or across schools. Sustainability practices were only rated at low levels (e.g., minimal/typical levels). Unexpectedly, the strongest source of variability in scores was for the sets of indicators. The estimated variance components for indicators were 29.3% for economic sustainability; 35.4% for environmental sustainability; and 11.5% for sociocultural sustainability.

There was also low variability between raters. The percentages of estimated variance components for each scale indicated no substantial differences between raters (0% for economic sustainability; .3% for environmental sustainability; and 0% for sociocultural sustainability). In the ERS-SDEC guidelines, it is recommended to observers to consult administrators, teachers, or children before rating indicators which cannot be identified during the scheduled observation period. For example, one of the indicators in the environmental subscale defined as “children’s attention is explicitly drawn to the need to care for the environment of the setting and in the local community” cannot be witnessed by observers. Hence, observers can interview staff to have valid conclusions about the related item. In this regard, it can be suggested based on this finding that indicators in each subscale, at least, for use in schools in Turkey, may need to be redesigned.

For the interaction effects (Table 1), the variance components for school–rater and rater–indicator for the estimated variances were also low across the three subscales. However, the percentages for the estimated variance components for the school–indicator interactions explained high levels of variability (40.3% of total variance for economic sustainability, 28.2% for environmental sustainability, and 52.1% for sociocultural sustainability). Interpretation of these findings is that the schools differed extensively on how they scored on some indicators.

There are extensive limitations about measuring process. Some indicators can be clearly observed and rated, while other indicators cannot. For example, some environmental conditions might be more easily observed in some schools (e.g., recycling bin, devices for water saving, buildings with eco-friendly technologies) and can be scored accurately, while other indicators on the scoring scale might only be able to be scored from interview information, for example “Children are encouraged to identify a range of environmental issues and to suggest their own ideas”; “Children’s attention is specifically drawn to economic issues of concern to the local and international community (e.g., discussing a TV report that an individual child has identified)”; or “Children are encouraged to share their ideas and knowledge of their own and others’ cultures in group sharing times and are able to speak openly about diversity.”

Residual variance components were relatively high (25% of the total variance for economic sustainability, 24.3% for environmental sustainability, and 29.3% for sociocultural sustainability). This indicated random error variation in the source data, which aside from the limitations of the measure, could be differences between schools by socioeconomic level of the school neighborhood; different levels of awareness about sustainability by teachers and school administrators; or different levels of motivation of staff and administrators to implement sustainability practices.

Generalizability Coefficients: *G* and *Phi*

A key objective in using generalizability theory was to establish the dependability of scores generated on the OMEP Environmental Rating Scale for Sustainable Development in Early Childhood, to assess if this measure is suitable for use in future research in schools in Turkey, or in other countries. Accuracy and dependability of this measurement tool are identified by the size of generalizability (*G*) and *Phi* coefficients. The *G* coefficient is used to estimate a reliability coefficient about the dependability of the ERS scores for relative decisions; for example, to reliably use the sustainability indicator scales to categorize schools according to the quality level of their sustainability practices. The *Phi* coefficient is a criterion-related reliability coefficient assessing how accurately each school can be judged on its sustainability performance. The coefficient can range from 0 to 1, with acceptable levels considered to be above .70. In Table 2, it is evident that only the coefficients for environmental sustainability have close to acceptable levels of accuracy and dependability (*G* coefficient = .78; *Phi* coefficient = .66).

Discussion

This study comprehensively examined the reliability of the OMEP Environmental Rating Scale for Sustainable Development in Early Childhood (ERS-SDEC). It was established that the indicators used on the three subscales of the ERS-SDEC did not provide strong statistical evidence for reliable measurement for the trials conducted in Turkey. There are many challenges in cross-cultural efforts to develop reliable and valid measures of sustainability practices in early childhood education. On the one hand, it is clear that there is a need to reassess the relevancy of the content, meaning of the indicators descriptions, and comparable observer practices. On the other hand, none of the countries who participated in the OMEP ESD Research and Development Project has reported reliability and validity for this scale.

It is evident that the indicators used on the environmental subscale of the ERS-SDEC are clearer and more commonly understood than the indicators on the economic and sociocultural subscales. While improvements on education for sustainability have occurred around the world, the focus on environmental education has remained most prominent. The progress in Turkey started in 1992 after the Earth Summit in Rio de Janeiro, which led to the United Nations Framework Convention on Climate Change (UNFCCC) that focused on environment education. These efforts began with the Seventh Five-Year Development Plan in 1994 and the Turkish

Table 2 *G* and *Phi* coefficients for research design—school by rater by indicator

	<i>G</i> coefficient	<i>Phi</i> coefficient
Economic sustainability	.58	.47
Environmental sustainability	.78	.66
Sociocultural sustainability	.63	.59

National Environment Action Plan that was published by the State Planning Organization in 1998. These organized action movements toward environment education have been effective.

In Turkey, non-government organizations such as the TEMA Foundation (2018) and the Foundation for Environmental Education in Turkey have carried out many education and advocacy activities to develop environmental consciousness. TEMA conducts environment training for children and educators, carries out training in ecological literacy, prepares educational programs, guidelines, and books, and conducts monitoring and evaluation studies. Kahyaoğlu (2016) identified and analyzed various studies published in Turkey between 2000 and 2013 in the area of environmental education. There were 179 studies identified utilizing different research designs, which were published in 34 different journals. Practices devoted to environment education at all grades in schools have continued, and as a result, the environmental pillar of education for sustainability is more understandable in communities leading to the implementation of relevant policies and practices. Similarly, in the research conducted with early childhood teachers in Japan and Australia, many teachers integrate environment education practices in their existing curriculum (Inoue et al. 2016), as is apparent in Turkey. These efforts are also needed to develop practices for the sociocultural and economic sustainability pillars in Turkey and possibly in other countries. However, this may also require more time and attention through policy initiatives and advocacy efforts to become established in school practices.

Future research could consider cross-cultural research with larger samples. However, for reliable and valid results, the ratings of the ERS-SDEC could be standardized for each country, although the findings of the current study indicate that descriptions of the indicators and scoring system need some modifications. For future quantitative comparative studies, it would be recommended to define the indicators more clearly and reconsider the scoring system for ease of use. A reliable and valid research tool could then allow extended directions for usage with different subgroups in educational settings that vary according to culture, region, school type, and different school levels.

Conclusions

This study explored the reliability of the measurement tool The OMEP Environmental Rating Scale for Sustainable Development in Early Childhood (ERS-SDEC) to assess the reliability of the economic, environmental, and sociocultural subscales to assess sustainability practices which are in use in preschools in Turkey. The analysis used generalizability theory to identify influences on the variances of the scores. It was recommended that the sustainability indicators could be improved for use in the Turkish context to ensure measurement that is more reliable.

The ERS-SDEC has been used in more than 60 preschools located in Europe, North America, South America, Australia, Africa, and the Middle and Far East. Future research should continue across countries to develop and refine the current indicators to improve the reliability and validity of the scale. Future revisions of the measure could draw on existing evidence from the baseline studies to make practical recommendations

for continued development of this important scale for use in early childhood education settings.

Appendix: Summary of Means and Standard Deviation Scores of Indicators

Subscales	Rater	No. of indicators	<i>M</i>	SD	Levels
Environmental sustainability	1	4	5.78	1.07	Good
		4	5.64	1.02	Good
		4	4.67	1.22	Good
		2	.39	.10	Inadequate
		1	1.65	.24	Inadequate
	2	4	5.64	1.20	Good
		4	6.17	.92	Good
		4	5.10	1.13	Good
		2	.63	.18	Inadequate
		1	1.75	.25	Inadequate
Economical sustainability	1	4	4.72	1.14	Good
		4	3.26	1.30	Minimal
		4	1.60	.53	Inadequate
		3	1.60	.46	Inadequate
		2	2.04	.59	Minimal
	2	4	5.15	1.17	Good
		4	3.60	1.24	Minimal
		4	2.19	.82	Minimal
		3	1.12	.68	Inadequate
		2	2.92	.64	Minimal
Sociocultural sustainability	1	4	2.87	1.03	Minimal
		4	2.67	1.05	Minimal
		4	3.16	1.32	Minimal
		3	1.99	.58	Inadequate
		1	1.65	.24	Inadequate
	2	4	3.21	1.12	Minimal
		4	2.58	1.21	Minimal
		4	3.84	1.10	Minimal
		3	1.85	.41	Inadequate
		1	1.65	.24	Inadequate

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