A Scale for Measuring Sustainable Manufacturing Practices and Sustainability Performance: Validity and Reliability

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Yousif M. Ibrahim, Norsiah Hami, Susan S. Abdulameer

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ABSTRACT

Purpose: In quantitative studies, providing a valid and reliable instrument is necessary to ensure accurate results when measuring sustainable manufacturing practices (SMPs) and sustainability performance (SP). Therefore, this study aims to evaluate the validity and reliability of the measurements of SMPs and SP.

Methodology/Approach: The population of this study is top managers who have experience in the oil and gas industry (O&GI) in Iraq. Two tests were carried out in the present study: the pre-test and the pilot test.

Findings: In the pre-test, the comments made by six academicians and three practitioners were used to rephrase the measurements items and modify them according to the requirements of the O&GI by the Iraqi context. Moreover, in the pilot test was all the items were reliable and were sufficiently correlated with their constructs.

Research Limitation/Implication: There are some limitations to the current study. First, due to the small size of the study population, the pilot test sample in the current study was only 12 respondents. Future researchers can increase the sample size for the pilot test when they have a large population. Second, the validity and reliability of the measurements were tested in the current study in the oil and gas industry only. Future studies can test these measurements in other industries or small and medium-sized enterprises (SMEs).

Originality/Value of paper: Theoretically, there are four contributions to the body of knowledge: first, introduce measures for SMPs according to the product life cycle view, it is limited in the literature. Second, these measures can be used by researchers to study the extent of SMPs and the SP of companies using descriptive statistics. Third, these measures can be used to investigate the impact of SMPs on SP by regression testing or structural equation modelling. Fourth, measures can be modified into open-ended questions for use in qualitative or
mixed studies. Practically, there are two practical implications which explain in
the conclusion.

**Category:** Research paper

**Keywords:** sustainable manufacturing practices; sustainability performance; pre-
test; pilot test; oil and gas industry

**1 INTRODUCTION**

Sustainability performance (SP) become an essential issue and a significant
concern in the oil and gas industry (O&GI) in Iraq (Ibrahim, Hami and Othman,
2019). This is because of the imbalance among the dimensions of SP that
includes: economic, environmental and social sustainability. For example, the
report of the ESCWA reported the proportion of Iraqi exports of oil equivalent to
99% of the total annual exports (UN-ESCWA, 2018). This establishes the
importance of this industry in the economic development in Iraq. Nonetheless,
this industry considers the main reason for environmental emissions and social
damage (Elhuni and Ahmad, 2017).

Actually, due to their nature and size, the O&GI has main impacts of health,
safety global and environment (Schneider et al., 2011). Also, particulate matter
and volatile compounds of filters in oil and gas companies cause many diseases,
both for workers and the community in the same area, such as cancer diseases
and respiratory diseases (EPA, 2003). Moreover, the main areas for the Extract
and production of oil in Iraq, 70% of them have pollution matters in the
environment and involve areas such as Kirkuk, Maysan, Basrah, Salah al-Din,
Baghdad and Mosul (Al-Haleem, Awadh and Saeed, 2013). Nevertheless, to
obtain a balance among the pillars of SP, there should be sustainable practices
and activities in the O&GI.

In this respect, empirical evidence in literature has confirmed that sustainable
manufacturing practices (SMPs) according to the product life cycle view:
sustainable product design (SPD), sustainable manufacturing process (SMP),
sustainable supply chain management (SSCM) and sustainable end-of-life
management (SEoLM) (Abdul-Rashid et al., 2017a), improve economic,
environmental and social sustainability and thus balance it. To achieve this
improvement and balance, there should be measurements valid and reliable
regarding SMPs and SP.

According to Creswell and Creswell (2018), in quantitative studies, when there is
any adapt on one or combine measurements, the prior validity and reliability may
not apply for the new measurements. Hence, it has become significant to
assessed new validity and reliability for the new measurements before
conducting the main study. Therefore, this study aims to evaluate the validity and
reliability of the measurements of SMPs and SP among the O&GI in Iraq. The
results of this study can be beneficial in several aspects. The researchers will
have a valid and reliable instrument to measure SMPs and SP, particularly in the O&GI. Besides, top management and managers in the O&GI will obtain a deeper perception of how to measure SMPs and SP. Theoretically, there are four contributions to the body of knowledge: first, introduce measures for SMPs according to the product life cycle view, it is limited in the literature. Second, these measures can be used by researchers to study the extent of SMPs and the SP of companies using descriptive statistics. Third, these measures can be used to investigate the impact of SMPs on SP by regression testing or structural equation modelling. Fourth, measures can be modified into open-ended questions for use in qualitative or mixed studies. Practically, there are two practical implications. First, managers can measure their companies’ implementation of SMPs using a 6-point Likert scale. Second, measure the level of SP achieved and compare with the performance in previous years.

2 METHODOLOGY

The O&GI is one of the most top sectors that largely contributed to the GDP of Iraq (OPEC, 2018). This contribution is very important, especially in employment opportunities and exports. Consequently, the population of this study is top managers and senior executives who have experience in the O&GI in Iraq. In parallel to the enormous contribution to the GDP of the country and its large contribution to the environmental and social impacts to the nation because its harmful operational activities, on the other side, the pre-test was conducted to verify the face validity (Hair et al., 2013). Then, the pilot test was carried out to establish the reliability of the measurements used in the current study (Saunders, Lewis and Thornhill, 2016).

Scaling design of the items will be used on a “6-point Likert scale”: “1” = “Strongly Disagree” (SD); “2” = “Moderately Disagree” (MOD); “3” = “Slightly Disagree” (SLD); “4” = “Slightly Agree” (SLA); “5” = “Moderately Agree” (MOA); and “6” = “Strongly Agree” (SA). The reason for using the 6-point Likert scale was to ensure that participants did not easily check the “indifference” option or “midpoint”, as usually occur with a 5-point scale. The midpoint means the neutral response when answering the questionnaire with of exist an odd number of categories used in a scale (Hair et al., 2017). He also emphasised that the researcher usually uses the scale without the midpoint when many respondents are expected to choose neutrals on a particular issue. This is because it provides an easy option that needs a few efforts and is easily justified (Krosnick and Fabrigar, 1997). Garland (1991) argued that the participants would answer based on the content of the questions when given an even number of a response scale. Additionally, participants from Asian countries tend to choose the middle category response than those from Western countries (Si and Cullen, 1998; Thrulogachantar and Zailani, 2011). It was also found that the validity and reliability of the findings tend to be higher for the even number response scale a six-point in particular (Chomeya, 2010) when compared to the odd number.
response scale (Krosnick and Fabrigar, 1997; Andrews, 1984; Alwin and Krosnick, 1991; Birkett, 1986; Coelho and Esteves, 2007).

The designed questionnaire was divided into three sections, which were the first section: focuses on SMPs implemented by oil and gas companies in Iraq, second section: focuses on identifying SP that can be achieved through the implementation of SMPs and the third section: provide a profile of the company and personal. Appendix (Table A1) states the items in the first and second sections of the questionnaire and the references adapted from them.

3 RESULTS AND DISCUSSION

3.1 Pre-test (Validity)

The pre-test process involves face validity. The face validity is done through systematic assessment of the measurement based on subjective judgment by the experts (Hair et al., 2013) to verify the measurement’s ability to measure what it is supposed to measure in the study (Hair et al., 2017). They also pointed out that this validation method is commonly used in management and business research. Therefore, the study measurements that adapted from previous studies for the SMPs and SP were sent to six experts who are familiar with the constructs of this study to attest the face validity of the measurements. Additionally, three oil and gas industry’s practitioners were also contacted for the same purpose. Their feedback, recommendations and comments have been made. Results of face validity by the experts in the pre-test is shown in Table 1.

Table 1 – Results of Face Validity by Experts in the Pre-Test

| Expert Type | Variable | Comment | Action |
|-------------|----------|---------|--------|
| Academicians | SMPs | • Add the words “Our company practices” at the below of each dimension of sustainable manufacturing practices. | “Our company practices”. |
|             |         | • Modify the item by changing the word “Eliminating” to “Eliminates” in the item of “Eliminating the use of hazardous materials during the design of the products”. | “Eliminates the use of hazardous materials during the design of the products” |
|             |         | • Modify the item by changing the word “Design the products which will prolong the life of materials”. | “Design the products which will prolong its lifetime”. |
|             |         | • Modify the item by changing the words “Savings of energy” to “Save energy” in the item of “Savings of energy during the manufacturing process”. | “Save energy during the manufacturing process”. |
|             |         | • Modify the item by changing the word “process” to “processes” in the item of “Utilise lean production process”. | “Utilise lean production processes”. |
|             |         | • Modify the item by changing the word | “Adopts of sustainable |
### 3.2 Pilot Test (Reliability)

After the questionnaire is constructed (Sekaran and Bougie, 2016; Kumar, 2014), it is necessary to test it before using it to actual data collection (Dawson, 2009; Oppenheim, 2000; Adams, Khan and Raeside, 2014; Fink, 2017). This is because, without a trial test, we will not be able to tell if the questionnaire will succeed (Saunders, Lewis and Thornhill, 2016). Moreover, because this study adapted the measurements from different sources (Hair et al., 2014) regarding the constructs of SMPs and SP.

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**Table 1**

| Expert Type | Variable | Comment | Action |
|-------------|----------|---------|--------|
| Academicians | SP | “Adoption” to “Adopts” in the item of “Adoption of sustainable suppliers”.
  • Modify the item by changing the word “Using” to “Use” in the item of “Using a less, cleaner or reusable packaging”.
  • Modify the item by changing the worded “Providing recycling support using components and material coding standards”.
| Practitioners | Profile of company and personal | “In the last three years, please describe your company’s achievements for economic performance caused by the current practices (as you described in sections one and two)”.
  • “Reduced emission of greenhouse gases”.
  • “Reduced solid waste”.
  • “Reduced liquid waste”.

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**3.2 Pilot Test (Reliability)**

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Data collection in the research process usually begins with a pilot test (Cooper and Schindler, 2014). Saunders, Lewis and Thornhill (2009) defined a pilot test as “small-scale study to test a questionnaire, interview checklist or observation schedule, to minimise the likelihood of respondents having problems in answering the questions and of data recording problems as well as to allow some assessment of the questions’ validity and the reliability of the data that will be collected”.

There are many essential purposes for conducting the pilot test include understanding or interpreting questions by respondents (Kumar, 2011; Sekaran and Bougie, 2010) and clarity of wording of the questions and estimate achievement times (De Vaus, 2002; Adams, Khan and Raeside, 2014). Also, the pilot test will help to clarify the extent the flow and sequences of questions (Bryman and Bell, 2015; Oppenheim, 2000), as well as it will enable to get some evaluation of the validity of the questions and the potential reliability of the data to be collected (Saunders, Lewis and Thornhill, 2016). In order to achieve the purposes of the pilot test, Bell and Waters (2014) suggested to give the respondents a short questionnaire attached to the original questionnaire of the study includes a set of questions to know the following: (1) How long did it take to complete the questionnaire?, (2) were the questionnaire instructions clear?, (3) are there any unclear or vague questions? If there is, please specify, and why?, (4) do you have any objection to answering any question?, (5) do you think any significant topic has been deleted?, (6) do you think the layout of the questionnaire is clear/attractive? and (7) any other comments?

Indeed, to make sure the questionnaire has achieved the purposes mentioned above (Oppenheim, 2000), the pilot test should be conducted with respondents who are similar to those that will be used in the full study (Saunders, Lewis and Thornhill, 2016; Zikmund et al., 2013; Hair et al., 2014). Naturally, the closer the link between the pilot sample and the final sample, the better (De Vaus, 2002). Given this, the reliability test must be carried out.

Principally, reliable measurements mean that they achieve the same result on repeated occasions (De Vaus, 2002). Cronbach’s alpha was used for this purpose based on the recommendations of several researchers (e.g., DeVellis, 2016; Saunders, Lewis and Thornhill, 2016; Colton and Covert, 2007). Cronbach’s alpha ranges from 0 to 1, the lowest acceptance value 0.70 (Hair et al., 2013). Moreover, the item analysis method was used by corrected item-total correlation test to estimate the reliability of responses within an instrument (Colton and Covert, 2007; Field, 2009), as well as, explains the most correlated items with the construct, meanwhile the value of any item is less than .30, it is deleted (Nunnally and Bernstein, 1994; Field, 2009; Hair et al., 2017). Bradburn, Sudman and Wansink (2004) recommended that no more than 10-12 participants are sufficient to detect the difficulties and weaknesses in the pilot test questionnaire. Likewise, Van Belle (2008) recommended that the sample size for the pilot test should be not a minimum of 12 participants. Besides, Fink (2013) stated that the minimum number of participants for a pilot test is 10 (cited in
Saunders, Lewis and Thornhill, 2016). In short, the literature has illustrated that the sample of the pilot test is few and is not considered an issue either in quantitative or qualitative studies (Khattab and Wahid, 2015). Thus, 12 sets of questionnaires were distributed; all the questionnaires that were returned were usable. Using SPSS.V.25, the reliability of the measurements and the item analysis was analysed (Field, 2013; Pallant, 2011), as displayed in Appendix (Table A2).

Based on the pilot study feedback by the seven questions that attached to the original questionnaire of the study (Bell and Waters, 2014), certain words were reconstructed to provide a better understanding to respondents in the main survey. Also, the pilot test revealed that on average, respondents took about 15 to 20 minutes to complete the survey instrument. In addition, Table A2 (Appendix) shows that the result of reliability ranges from 0.794 to 0.906 suggested that all the Cronbach’s alpha values were greater than 0.70, which indicate that the 56 measurements were reliable (Hair et al., 2014). Besides, based on the item analysis, all the items correlate higher than 0.30 for the corrected item-total correlation, which ranged from 0.344 to 0.946. These indicate that all items are correlated with their constructs. Therefore, all items have been retained without the need to delete any of them.

4 CONCLUSION

In conclusion, providing a valid and reliable instrument is necessary to ensure accurate results when measuring SMPs and SP. In this respect, two tests were carried out in the present study: the pre-test to establish the validity of the measurements, and the pilot test to check the reliability of the measurements. In the pre-test, the comments made by academician experts and practitioners were used to rephrase items and modify them according to the requirements of the O&GI by the Iraqi environment. Moreover, in the pilot test, some significant findings were identified: an average, respondents took about 15 to 20 minutes to complete the questionnaire, the response rate was 100% high, all the items were reliable and were sufficiently correlated with their constructs. Therefore, this study provides valid and reliable measurements that can give a better understanding to researchers, top management and managers in the O&GI on how to measure SMPs and SP. Theoretically, there are four contributions to the body of knowledge: first, introduce measures for SMPs according to the product life cycle view, it is limited in the literature. Second, these measures can be used by researchers to study the extent of SMPs and the SP of companies using descriptive statistics. Third, these measures can be used to investigate the impact of SMPs on SP by regression testing or structural equation modelling. Fourth, measures can be modified into open-ended questions for use in qualitative or mixed studies. Practically, there are two practical implications. First, managers can measure their companies’ implementation of SMPs using a 6-point Likert
scale. Second, measure the level of SP achieved and compare with the performance in previous years.

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ABOUT AUTHORS

Yousif Munadhil Ibrahim – (Y.M.I.) Universiti Utara Malaysia, Malaysia, College of Business, School Of Technology Management & Logistic, Dr., e-mail: yousifmunadhil58@gmail.com, Author’s ORCID: 0000-0002-7314-2638.
Norsiah Hami – (N.H.) Universiti Utara Malaysia, Malaysia, College of Business, School Of Technology Management & Logistic, Senior Lecturer, e-mail: norsiahami@uum.edu.my, Author’s ORCID: 0000-0002-9673-8012.

Susan Sabah Abdulameer – (S.S.A.) Universiti Utara Malaysia, Malaysia, College of Business, School Of Technology Management & Logistic, Dr., e-mail: susansubah50@gmail.com, Author’s ORCID: 0000-0003-4441-9930.

AUTHOR CONTRIBUTIONS
Y.M.I. – writing—original draft preparation; N.H. – supervision; N.H., S.S.A. – review and editing.

CONFLICTS OF INTEREST
The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.
## APPENDIX

### Table A1 – Measurement Items of SMPs and SP and Their References

| Code | Item | Reference |
|------|------|-----------|
| **SPD** | | |
| SPD.1 | Eliminating the use of hazardous materials during the design of the products. | Abdul-Rashid et al. (2017a), Abdul-Rashid et al. (2017b) |
| SPD.2 | Design the products which will facilitate disassembly of retired products, separation of parts according to materials, as well as reprocessing of materials. | |
| SPD.3 | Design the products which will facilitate repair, rework and refurbishment. | |
| SPD.4 | Design the products which will reduce material use. | |
| SPD.5 | Design the products which will reduce energy consumption. | |
| SPD.6 | Use environmental-friendly materials (e.g. recyclable materials). | |
| SPD.7 | Design the products which support maintenance. | |
| SPD.8 | Design the products which will prolong the life of materials. | |
| **SMP** | | |
| SMP.1 | Savings of energy during the manufacturing process. | Abdul-Rashid et al. (2017a), Abdul-Rashid et al. (2017b) |
| SMP.2 | Emissions reduction during the manufacturing process. | |
| SMP.3 | Improve manufacturing and machines efficiency. | |
| SMP.4 | Utilise lean production process. | |
| SMP.5 | Commitments to sustainable programmes, standards or regulations. | |
| SMP.6 | Setting sustainable targets and objectives. | |
| SMP.7 | Measure and inspection of material flows or wastes. | |
| **SSCM** | | |
| SSCM.1 | Adoption of sustainable suppliers. | Abdul-Rashid et al. (2017a), Abdul-Rashid et al. (2017b) |
| SSCM.2 | Influence suppliers to practice sustainable initiatives. | |
| SSCM.3 | Sustainable collaboration with suppliers. | |
| SSCM.4 | Impact customers to accept sustainable practices, services or products. | |
| SSCM.5 | Using a less, cleaner or reusable packaging. | |
| SSCM.6 | Use energy-efficient transportation. | |
| SSCM.7 | Use energy-efficient logistics (e.g. warehouse location and routes). | |
| **SEoLM** | | |
| SEoLM.1 | Prolong the service life of products or materials by providing support services to customers. | Abdul-Rashid et al. (2017a), Abdul-Rashid et al. (2017b) |
| SEoLM.2 | Providing hazardous waste treatment in the company for products after recovery from the market. | |
| SEoLM.3 | Providing and managing product warranty returns. | |
| Code      | Item                                                                 | Reference                                      |
|-----------|----------------------------------------------------------------------|-----------------------------------------------|
| SEoLM.4   | Providing and managing recalls (e.g. reconditioning, reselling).     |                                               |
| SEoLM.5   | Providing recycling support using components and material coding      |                                               |
|           | standards.                                                           |                                               |
| EcS.1     | Increased net profits.                                               | Bansal (2005), Paulraj (2011), Elhuni and     |
|           |                                                                     | Ahmad (2017), Zhu and Sarkis (2004)           |
| EcS.2     | Increased revenue growth.                                            |                                               |
| EcS.3     | Increased revenue through the sale of waste products.                |                                               |
| EcS.4     | Increased return on assets.                                          |                                               |
| EcS.5     | Increased return on investment.                                      |                                               |
| EcS.6     | Decreased costs.                                                     |                                               |
| EcS.7     | Commitment to production plan %.                                     |                                               |
| EcS.8     | Improving delivery performance.                                      |                                               |
| EnS.1     | Reduced emissions of greenhouse gas.                                 | Frank, Nwuche and Anyanwu (2016), Paulraj     |
|           |                                                                     | (2011), Zhu and Sarkis (2004), Elhuni and     |
|           |                                                                     | Ahmad (2017)                                  |
| EnS.2     | Reduced flaring gas.                                                 |                                               |
| EnS.3     | Reduced solid wastes.                                                |                                               |
| EnS.4     | Reduced liquid wastes.                                               |                                               |
| EnS.5     | Reduced water usage.                                                 |                                               |
| EnS.6     | Reduced oil spills.                                                  |                                               |
| EnS.7     | Reduced energy consumption.                                          |                                               |
| EnS.8     | Reduced consumption of hazardous/harmful/toxic materials.            |                                               |
| EnS.9     | Reduced environmental accidents.                                     |                                               |
| SoS.1     | Increased local procurement and supplier development.                | Elhuni and Ahmad (2017), Frank, Nwuche and    |
|           |                                                                     | Anyanwu (2016), Bansal (2005), Infante et al. |
| SoS.2     | Increased preventing corruption.                                     |                                               |
| SoS.3     | Increased workforce diversity.                                       |                                               |
| SoS.4     | Increased workforce engagement.                                      |                                               |
| SoS.5     | Increased workforce training and development.                        |                                               |
| SoS.6     | Decreased rates of work-related injury frequency.                   |                                               |
| SoS.7     | Decreased rates of work-related occupational illnesses.              |                                               |
| SoS.8     | Decreased rates of work-related deaths.                              |                                               |
| SoS.9     | Participation in community affairs.                                  |                                               |
| SoS.10    | Provide societal health facilities.                                  |                                               |
| SoS.11    | Improved health and safety community.                                |                                               |
| SoS.12    | Increased social investment.                                         |                                               |
Table A2 – Results of the Reliability Test in the Pilot Test

| Dimension | Item     | Corrected Item-Total Correlation | Cronbach’s Alpha if Item Deleted | Cronbach’s Alpha |
|-----------|----------|----------------------------------|----------------------------------|------------------|
| **SMPs**  |          |                                  |                                  |                  |
| **SPD**   | SPD.1    | 0.796                            | 0.884                            | 0.906            |
|           | SPD.2    | 0.596                            | 0.903                            |                  |
|           | SPD.3    | 0.818                            | 0.882                            |                  |
|           | SPD.4    | 0.532                            | 0.907                            |                  |
|           | SPD.5    | 0.727                            | 0.893                            |                  |
|           | SPD.6    | 0.818                            | 0.882                            |                  |
|           | SPD.7    | 0.652                            | 0.898                            |                  |
|           | SPD.8    | 0.670                            | 0.896                            |                  |
| **SMP**   | SMP.1    | 0.613                            | 0.877                            | 0.886            |
|           | SMP.2    | 0.406                            | 0.903                            |                  |
|           | SMP.3    | 0.661                            | 0.872                            |                  |
|           | SMP.4    | 0.744                            | 0.861                            |                  |
|           | SMP.5    | 0.848                            | 0.848                            |                  |
|           | SMP.6    | 0.744                            | 0.861                            |                  |
|           | SMP.7    | 0.753                            | 0.860                            |                  |
| **SSCM**  | SSCM.1   | 0.344                            | 0.800                            | 0.794            |
|           | SSCM.2   | 0.726                            | 0.728                            |                  |
|           | SSCM.3   | 0.591                            | 0.755                            |                  |
|           | SSCM.4   | 0.434                            | 0.784                            |                  |
|           | SSCM.5   | 0.592                            | 0.754                            |                  |
|           | SSCM.6   | 0.592                            | 0.754                            |                  |
|           | SSCM.7   | 0.403                            | 0.790                            |                  |
| **SEoLM** | SEoLM.1  | 0.836                            | 0.853                            | 0.892            |
|           | SEoLM.2  | 0.927                            | 0.823                            |                  |
|           | SEoLM.3  | 0.775                            | 0.861                            |                  |
|           | SEoLM.4  | 0.685                            | 0.882                            |                  |
|           | SEoLM.5  | 0.531                            | 0.908                            |                  |
| **SP**    | **Economic Sustainability** | **EcS.1** | 0.819 | 0.880 | 0.904 |
|           | EcS.2    | 0.665                            | 0.895                            |                  |
|           | EcS.3    | 0.730                            | 0.888                            |                  |
|           | EcS.4    | 0.741                            | 0.889                            |                  |
| Dimension               | Item | Corrected Item-Total Correlation | Cronbach’s Alpha if Item Deleted | Cronbach’s Alpha |
|-------------------------|------|----------------------------------|----------------------------------|------------------|
|                         | EcS.5| 0.946                            | 0.868                            |                  |
|                         | EcS.6| 0.574                            | 0.902                            |                  |
|                         | EcS.7| 0.639                            | 0.897                            |                  |
|                         | EcS.8| 0.488                            | 0.909                            |                  |
| Environmental Sustainability | EnS.1| 0.638                            | 0.846                            | 0.864            |
|                         | EnS.2| 0.409                            | 0.868                            |                  |
|                         | EnS.3| 0.840                            | 0.825                            |                  |
|                         | EnS.4| 0.364                            | 0.869                            |                  |
|                         | EnS.5| 0.476                            | 0.861                            |                  |
|                         | EnS.6| 0.545                            | 0.855                            |                  |
|                         | EnS.7| 0.763                            | 0.833                            |                  |
|                         | EnS.8| 0.592                            | 0.850                            |                  |
|                         | EnS.9| 0.753                            | 0.836                            |                  |
| Social Sustainability   | SoS.1| 0.847                            | 0.879                            | 0.899            |
|                         | SoS.2| 0.517                            | 0.896                            |                  |
|                         | SoS.3| 0.579                            | 0.893                            |                  |
|                         | SoS.4| 0.528                            | 0.895                            |                  |
|                         | SoS.5| 0.596                            | 0.892                            |                  |
|                         | SoS.6| 0.800                            | 0.881                            |                  |
|                         | SoS.7| 0.402                            | 0.902                            |                  |
|                         | SoS.8| 0.860                            | 0.878                            |                  |
|                         | SoS.9| 0.600                            | 0.892                            |                  |
|                         | SoS.10| 0.501                           | 0.897                            |                  |
|                         | SoS.11| 0.477                           | 0.898                            |                  |
|                         | SoS.12| 0.774                           | 0.885                            |                  |

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