
# INFLUENTIAL FACTORS ON SUSTAINABLE CONSTRUCTION INDUSTRY IN MYANMAR: A CASE STUDY OF PRIVATE RESIDENTIAL SECTOR IN YANGON

SAI KYEN WANN

A Thesis Submitted to the Graduate School of Naresuan University
in Partial Fulfillment of the Requirements
for the Master of Science in Logistics and Supply Chain
2022

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By Sai kyen Wann

has been approved by the Graduate School as partial fulfillment of the requirements

for the Master of Science in Logistics and Supply Chain of Naresuan University

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|---|---|
| **Title** | INFLUENTIAL FACTORS ON SUSTAINABLE CONSTRUCTION INDUSTRY IN MYANMAR: A CASE STUDY OF PRIVATE RESIDENTIAL SECTOR IN YANGON |
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| **Academic Paper** | M.S. Thesis in Logistics and Supply Chain, Naresuan University, 2022 |
| **Keywords** | Sustainable Construction, Myanmar Construction, Decision Making, Analytic Hierarchy Process (AHP) |

## ABSTRACT

The construction industry has continuously made an important contribution to the country's economy and GDP. At the same time, its activity has a great impact on society and the environment. The construction industry is increasingly approaching sustainability by integrating environmental sustainability, social equity, and economic efficiency into its operational practices. In Myanmar, the sustainable construction approach is challenging and still in its early stages. Without the right strategies based on influential factors, a successful approach to sustainability is impossible. On the path to achieving sustainable goals, it is useful to understand the influential factors in the relevant context. This study examines the professional perspectives in private residential construction in Yangon, the commercial capital and largest urbanized city and aims to 1) identify 20 influential factors on sustainable construction and 2) prioritize the most influential factors in terms of economic, social and environmental aspects using the Analytic Hierarchy Process (AHP) method, which compares experts' pairwise judgments in a hierarchy structure with consistency checks, and to weigh the importance of each factor using a quantitative survey method. Interviews and questionnaires were conducted with material suppliers, contractors, developers, building designers, academia, and members of city development committees at administrative and management levels in the residential sector. The results address, in order of influence, 8 factors for sustainable construction. It is found that professionals

consider the highest ranked factor "Political Stability" as the most important factor for sustainable construction with 27.7% of influence weight. The study highlights the essential findings for practitioners, decision-makers and policymakers in developing strategies to implement sustainability.

# ACKNOWLEDGEMENTS

Words cannot express my sincere gratitude to my advisor Dr. BoonSub Panichakarn for his invaluable advice and mentoring. Importantly, without his encouragement and patience, I could not have undertaken this journey. Thank you so much indeed! Furthermore, I would like to express my thanks to chair and examiners of the oral defense committee, who generously provided knowledge and expertise which has strengthened my thesis to be a complete one.

Next, I am truly grateful to Boonrawd Brewery Co., Ltd. and Naresuan University for providing me with full two-year scholarship for my graduation.

I am really thankful to my lecturers and classmates for the very nice learning environment and colorful moment of life. Also, I would like to express my appreciation for the staff of Faculty of Logistics and Digital Supply Chain for their friendliness and assistance in thesis process.

Thanks should also go to the study participants from the construction professionals in Myanmar. Their contribution for required information and data collection has made this study possible.

Lastly, I would be remiss in not mentioning my family, especially my daughters, spouse, and my dear departed mother. Their belief in me has raised my motivation and best endeavors to achieve my goal.

Sai kyen Wann

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# ABBREVIATIONS

| | | |
|---|---|---|
| AHP | = | Analytic Hierarchy Process |
| C1 | = | Criterion 1 (Economic) |
| C2 | = | Criterion 2 (Social) |
| C3 | = | Criterion 3 (Environmental) |
| CI | = | Consistency Index |
| CR | = | Consistency Ratio |
| F1 | = | Influential Factor 1 |
| F2 | = | Influential Factor 2 |
| F3 | = | Influential Factor 3 |
| F4 | = | Influential Factor 4 |
| F5 | = | Influential Factor 5 |
| F6 | = | Influential Factor 6 |
| F7 | = | Influential Factor 7 |
| F8 | = | Influential Factor 8 |
| GDP | = | Gross Domestic Product |
| JICA | = | Japan International Cooperation Agency |
| RI | = | Random Consistency Index |
| SCM | = | Supply Chain Management |
| SDGs | = | Sustainable Development Goals |
| YCDC | = | Yangon City Development Committee |

# CHAPTER I

# INTRODUCTION

## Background of the Research

Myanmar is an emerging country with a rapidly growing GDP and a continuous growth trend. According to Myanmar Statistical Yearbook 2020 (Central Statistical Organization, 2020), the country GDP in the fiscal year of 2019-2020 is about 120 trillion and the annual growth rate is 7.1% as shown in Figure 1. Due to the opening of the country in 2010, that is, the transition from a military government to a parliamentary government, the GDP in the construction sector has almost quadrupled compared to the last five years. After 4 years, it has doubled and recorded successive annual growth. Since then, the GDP of construction industry poses a potential continuous growth. In the fiscal year of 2019-2020, it contributes to nearly 8 trillion kyat or 6.6% of the whole nation GDP and the construction sector indicates 10.6% of the annual growth rate (Central Statistical Organization, 2020) as shown in Figure 2.

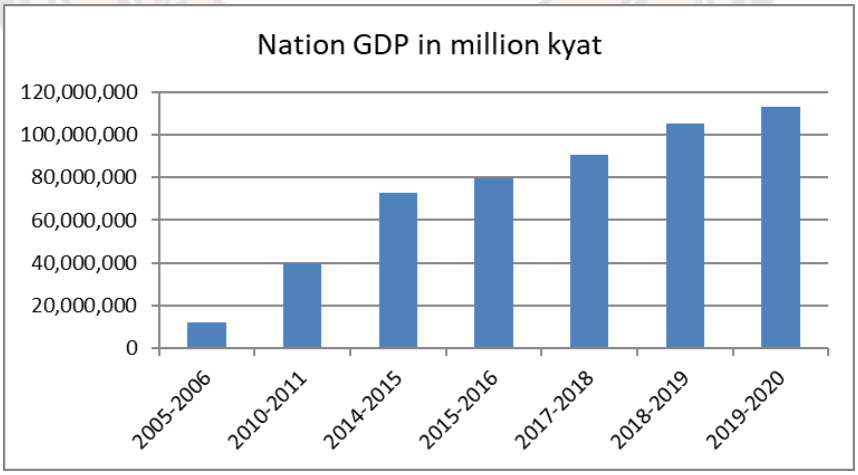



**Figure 1 Nation GDP of Myanmar**

Source: Central Statistical Organization; Ministry of Planning and Finance of the Union of Myanmar (Central Statistical Organization, 2020)

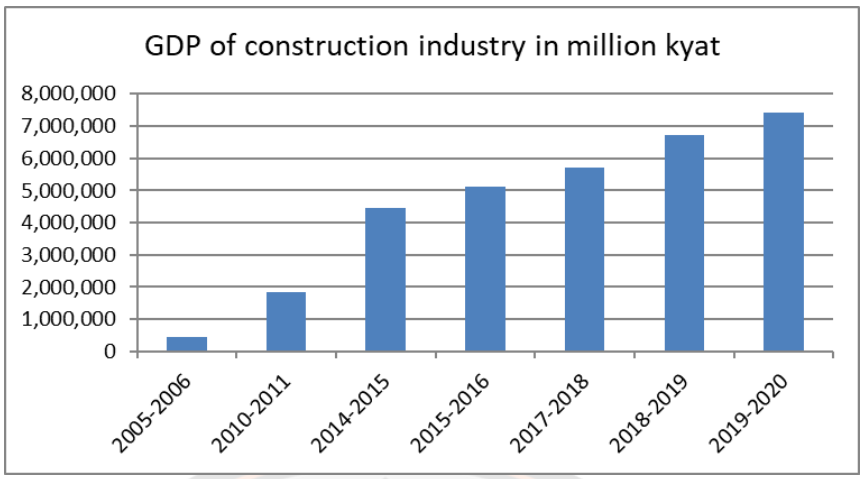



**Figure 2 GDP of construction industry in Myanmar**
Source: Central Statistical Organization; Ministry of Planning and Finance of the Union of Myanmar (Central Statistical Organization, 2020)

As shown in Figure 3, it is estimated that the residential sector contributes 49% of the whole nation's construction, which is the most dominant sector of construction in Myanmar compared to other sectors such as infrastructural, commercial and industrial sectors due to government housing plans and private commercial residential developments such as detached houses, apartments, and high-end condominiums in response to the demand of rapid urbanization (NewCrossroad Asia, 2012, as cited by Lynn, 2012).

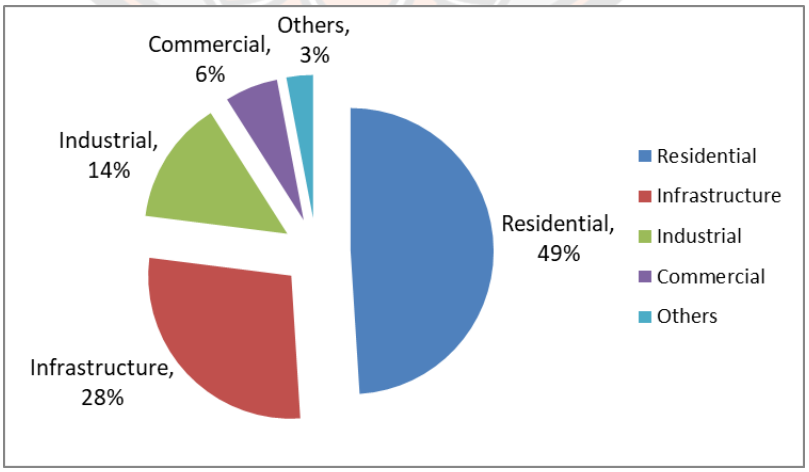
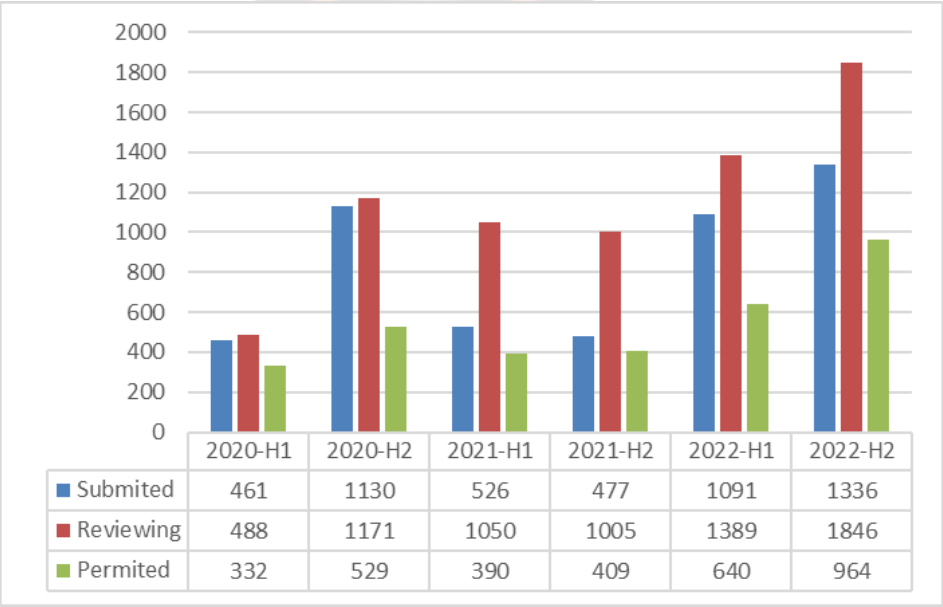



**Figure 3 Myanmar construction industry sector contribution 2013**
Source: (NewCrossroad Asia, 2012, as cited by Lynn, 2012)

All new buildings in the Yangon city area are required to submit the approval of permit from the Yangon City Development Committee (YCDC) before beginning construction. The total building permit count indicates the size and rising trend of construction in Yangon as shown in Figure 4. In the second half of 2022, 1336 units of buildings are submitted to build which is 22% higher than the first half of 2022. The permitted units are 946 which is 50% higher than the previous period.




| | 2020-H1 | 2020-H2 | 2021-H1 | 2021-H2 | 2022-H1 | 2022-H2 |
|---|---|---|---|---|---|---|
| Submited | 461 | 1130 | 526 | 477 | 1091 | 1336 |
| Reviewing | 488 | 1171 | 1050 | 1005 | 1389 | 1846 |
| Permited | 332 | 529 | 390 | 409 | 640 | 964 |

**Figure 4 Construction permits in Yangon**
Source: Yangon City Development Committee (Yangon City Development Committee, 2022)

The construction industry does not only play a crucial role in developing a country's economy but also causes a significant impact on the society and environment. It creates job opportunities and also leaves a lot of social issues such as noise from construction sites, health, life safety, etc. Further in term of environment, it raises concerns over rising carbon emissions, climate change, scarcity of resources and waste generation. An example of how construction can make a potential cause of CO2 emissions is seen in UK that contributes about 47% of the entire nation's cause (HM Government, 2010). As current expanding of urbanization in Yangon, rising

house demand accelerates the construction industry to build especially in major residential sector (Central Statistical Organization, 2020). It should be the opening of economic opportunities to embrace, and environmental and social challenges to overcome as well. However, green building development in Myanmar is in its initial stage and currently lacks governmental, or voluntary support to devise appropriate rules and regulations for sustainable construction. Awareness among developers, stakeholders, architects, engineers, contractors, employees and the public about green building are still far away from development progress (Lwin & Panuwatwanich, 2020).

**Research Aim**

This study aims to reveal the influential factors on the sustainable construction industry in Myanmar, which are the initial cornerstones in developing strategies to introduce sustainability in the industry.

**Research Questions**

1. What are the important issues that building professionals consider for sustainable construction?

2. What are the perceptions of building professionals toward sustainable construction weighing in aspects of economic, social and environmental benefits?

3. What are the most significant factors that building professionals emphasize for sustainable construction?

**Objectives**

1. To identify influential factors on sustainable construction industry in private residential sector in Yangon

2. To prioritize level of the influential factors

**Research Significance**

1. This study introduces the first formal early-stage study on examining sustainable factors in Myanmar construction industry that has high impacts on country's economy, society and environment.

2. It will improve the understanding of sustainability in construction and the result proposes a guideline for decision makers in developing strategies to overcome the problems and accelerate the sustainable initiative.

3. Then, sustainable construction industry will contribute its role in achieving the Sustainable Development Goals (SDGs).

**Research Scope**

This study focuses on private residential construction in Yangon city in Myanmar. The targeted informants are experts or professionals at administrative and management level in the construction field from the private sector and related government administrative units.

# CHAPTER II

# LITERATURE REVIEW

## Construction Industry in Yangon

Yangon is Myanmar's commercial capital. According to Department of Population, the population living in Yangon is 8.11 million or 15.06 percent of the whole population of the country which is 51.49 million in 2019 (Central Statistical Organization, 2020). It is situated in the southern part of Myanmar in the Irrawaddy delta on the Yangon River, near the Gulf of Motamma. It is the country's largest city that has sprawling area of 390 square kilometers in 2010 with principal seaport and its main commercial, manufacturing, and transportation center. According to Myanmar Census Department, the population living in Yangon area is 7.36 million or 13 percent of the whole population of the country which is 51.42 million in 2014. Yangon is the largest urbanized city of the country. Upon 1988, the government opened the country and initiated the market-oriented economy. That drew many foreign companies entered to settle their investment in Myanmar. Since then, Yangon has developed major land and expanded new towns; North Dagon and South Dagon in the east of the city. In the west is Hlaing Tharyar new town beside Hlaing Rier and Shwepyitha north of the Insein were developed to absorb the population of around half a million.

Although Naypyitaw is the current capital of the country, the former capital Yangon is still the country's main center for trade, industry, real estate, media, entertainment and tourism. The city alone represents about one fifth of the national economy. At least 14 light industrial zones ring Yangon, directly employing over 150,000 workers in 4,300 factories in early 2010 (Khaing, 2015). Most of import and export go through Thilawa Port, the largest and busiest port in Myanmar. In cooperation with Japan International Cooperation Agency (JICA), the 40-year Strategic Urban Development Plan of Grater Yangon was drafted and aims at transformation Yangon into modern urban. Accordingly, it will achieve balanced, inclusive, and sustainable growth, and cater to a better supply of urban infrastructure

and services for the urban inhabitants of Greater Yangon (Japan International Cooperation Agency, 2013).

In Yangon, environmental deterioration and health problems are mostly affected by the inadequate solid waste management system, like many cities in developing countries (Mya, 2016). Households and industries produce around 1690 tons of waste daily and waste is collected by manpower and garbage truck supported by Yangon City Development Committee (YCDC).

In Yangon, 135 million gallons of freshwater are supplied from Yangon City Development Committee every day and occupants consume over 200 million gallons a day. Thus, most people in extended urban areas depend on natural lakes, rivers, and tube wells (Zay, 2015). Newly constructed high-rise buildings in Yangon rely on 30 million gallons of water from tube wells daily because the current water supply of Yangon is unable to support water sufficiently. The more underground usage of water, the more dangerous the stability of buildings and some buildings constructed on soft soil are at risk of settlement in some townships (Zay, 2015). Yangon, surrounded by the sea, will encounter saltwater intrusion if groundwater from tube wells is extracted too much. Saltwater intrusion will occur from the base when the freshwater at the upper layer is depleted. Yangon would not become a smart and sustainable city if groundwater sources face risky conditions. Hence, Myanmar needs to apply water resources effectively and develop all aspects of sustainability in the construction industry.

**Sustainable Construction**

Sustainability is clearly described “Enhancing quality of life and thus allowing people to live in a healthy environment and improve social, economic and environmental conditions for present and future generations” (Ortiz et al., 2009). Sustainable construction is “creating and operating a healthy built environment based on resource efficiency and ecological design” (Hill & Bowen, 1997). The Environmental Protection Agency (EPA) defines “Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction”. This practice

expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high performance building.

Construction is one of the most significant industries in the world and accounts for 13% of world GDP. It has high impact not only on economy but also environment and society.

Energy use: Building activities take 20% of world energy usage (residential & commercial only) mainly during operation.

Air quality and atmosphere: Concurrently air pollution causes 18,000 people die each day worldwide and estimated one-third of greenhouse gas emission is from buildings.

Water use: Buildings are one of the largest water consumers.

Indoor environmental impacts: Indoor environment is very important for human health, comfort and productivity. Indoor pollutant levels are often higher than outside (typically 2.5 times and occasionally 100 times) as pollutant can come from building materials and components including other household things.

Material and waste impact: In total, buildings consume 75% of concrete, 38% of wood, 21% of steel, etc. Waste from Construction and demolition is twice the municipal waste yearly.

Land use impact: Construction activities transform valuable farmland and forests into physical assets. It negatively affects biodiversity, crop production, photosynthesis, air purification and other ecosystem services.

Fundamentally, benefits of sustainable construction can be described as follows.

Environmental benefits: These are Enhance and protect biodiversity and ecosystems, Improve air and water quality, Reduce waste streams, Conserve and restore natural resources, and Reduce global warming.

Economic benefits: These are Reduce operating and maintenance costs, Create, expand and shape markets for green product and services, Improve occupant productivity, Minimize occupant absenteeism, Optimize lifecycle economic performance, Improve the image of building, Gain reputation, and Reduce the civil infrastructure cost.

Social benefits: These are Enhance occupant comfort and health, Heighten aesthetic qualities opportunities, Create new and enhanced employment and business opportunities, Improve overall quality of life, and Minimize strain on local infrastructure.

Transition from conventional to sustainable construction has been in increasing trend (Sfakianaki, 2019). In the existing studies, examining influent factors, critical factors, barriers or obstacles (interchangeably mentioned) is found as one of the important stages in sustainable development and many researchers attempted to investigate their impact by different methods in various contexts. Bon-Gang examined 13 hindering obstacles by using a simple tabulation of percentages from 31 green building projects in Singapore - recognized as the leader in advocating sustainable construction with up-to-date and efficient strategies and initiatives. He highlighted “High cost premium of green building project” is the most important hindering factors (Bon-Gang, 2018). The case study in implementation of sustainability in construction supply chain in Thailand investigated 15 factors by Interpretive Structural Model and identified dealing with “National political instability” is the most influential challenge (Zou & Soratana, 2017). For the purpose of better resources’ allocation, based on 148 construction professionals worldwide survey, Gunduz and Almuajebh arranged 40 success factors into 7 categories to prioritize their important levels by combination of Relative Importance Index and AHP method and identified financial problems (Mechanism of financial payments, project’s adequate funds/resources), administrative aspects (Influence of client/client’s representative, availability of experienced managers and skillful workforce), and the authorities’ approval mechanisms (statutory approvals environment) respectively (Gunduz & Almuajebh, 2020). In the Ghanaian context, 31 factors comprising in 6 categories, were identified as barriers by Likert scale survey method. The strongest barrier to the implementation of sustainable construction in Ghana is “Cultural change resistance, lack of government commitment, fear of higher investment costs, lack of professional knowledge, and lack of legislation respectively.” (Ametepey et al., 2015).

**Influential Factors on Sustainable Construction Industry**

From the existing literature (Ametepey et al., 2015; Bon-Gang, 2018; Sfakianaki, 2019; Zou & Soratana, 2017) and discussions with targeted professionals, the prominent 20 factors on sustainable construction industry are adopted for the chosen context of the study before they are identified in professional interviews. The factors, drivers and obstacles for sustainable construction are adapted in the form of influential factors in this study for examining the professionals' perspective. The influential factors are described as follows:

1. "Design"

Sustainable building design begins with the proper site selection, including the existing building's rehabilitation. The location, orientation, and landscaping of a building all affect local ecosystems, transportation methods, and energy use. Good design optimizes energy use. It can help protect and reserve water providing to use water efficiently, and reuse or recycle water for on-site use. Good design optimizes building space and material use. It enhances indoor environmental quality. Specifications of proper materials and systems also optimize operation and maintenance.

2."Cost premium of green building project"

Normally cost premium of green building project is high. However green building gains competitive advantage in the market while seeking to offset the higher cost with the economic incentive.

3. "3Rs system (reduce/reuse/recycle) at the level of enterprise strategy"

Many materials are reusable. With today sustainable technologies, recycled materials can be used in real case. Those benefit economically and environmentally.

4. "Superlative communication and interest among project team members"

Sustainable building projects need superlative communication because their design features are unique and detailed to integrate with every aspect of the building.

5. "Expertise and knowledge in green building"

Experts, experienced professionals and consultancy services are essentially needed in green building.

6. "Managers and professionals strictly follow green construction practices framework"

They can manage and push the project to achieve sustainable goals.

7. " Interest from client and market demand"

Society of high sustainable awareness is willing to pay for premium sustainable services.

8. "Overcoming resistance to change from conventional to green practices by company's employees"

Unless traditional perception of how to build a building is still dominant, what are the obstacles?

9. "Government support (incentives) for sustainable construction"

Government support can be scheme to promote sustainability such as subsidy, lower tax, low interest rate loan, sustainable award, green mark certificate, etc.

10. "Credible research on the benefits of green buildings"

Improve research and development in products and technologies for green buildings.

11. "Political stability"

It is a high-impact external factor directly dealing with economic performance.

12. "Policies and regulations"

Government takes an important role here. Policy includes technical supports, promoting innovative sustainable construction techniques and creating training opportunities for general sustainability, sustainable construction principles, rating system requirements and technology. Pilot projects are also promoted. Regulations come with enforcement, measurement system, penalty and incentive package together. As a result, the right polices and regulations will facilitate sustainable implementation.

13. " Resource management (water; energy)"

Among life cycle phases of residential building, major energy is consumed during building operation (43% of all energy delivered). A study shows that a managed building can reduce 32.4% of energy use and 55.4% water consumption rates (by improving thermal insulation of the external walls and roofs; more efficient glazing; fitting external shading devices; and fitting energy-efficient fluorescent lighting. Suggested water conservation management includes the use of low-flow taps in kitchens and bathrooms; low-flow showerheads; efficient washing machines; and the installation of a grey water system)

14. "Embrace of sustainable technologies"

Environment-friendly materials, renewable energy and sustainable techniques reduce the adverse impacts on surrounding communities, and improve the utilization efficiency of natural resources in construction projects. Some good examples of sustainable technologies are prefabricated engineered solid wood panels, many novel materials composed from recycled construction and demolition wastes and the applications of grey water re-cycling systems in the building level.

15. "Application of lean construction"

Lean concept is to eliminate wastes produced in a construction process. They are not only physical wastes but including non-value-adding activities and waiting time. It prevents material losses and save costs. So, it improves operational efficiency and reduces wastes at the same time.

16. "Environment management (noise control; the improvement of surrounding environment)"

It is directly impact on living environment of the society widely.

17. "Promoting a sustainable mind-set and culture across organization"

Since mind-set and culture is the common brief and value of an organization, it will influence the key stakeholders' behaviors and decision-making. Positive culture can lead to adopt sustainable practices and share a common understanding of the definition, principles and concepts of sustainable construction.

18. "Developing sustainable awareness of clients"

The development of the awareness of home buyers about the potential of sustainable or green building is a high-impact driver. Research studies or evidence to convince that green building helps increase productivity and health of occupant. Besides good quality delivery, easily understandable information about the potential of sustainable building is also important. In order to enable this kind of work, relevant programs and projects should be developed, sponsored and offered by authorities.

19. "Cost of green building practice implementation"

Green projects are always more costly than conventional ones in economic aspect.

20. "Incentive mechanism for project team members"

Incentive mechanism (e.g., bonus, certificate of appreciation or other rewards) is designated for project team members who work hard, and devote their time, attention and efforts to adopt the sustainable construction practices towards sustainable goal.

**Analytic Hierarchy Process (AHP)**

Analytic hierarchy process is a problem-solving framework (Saaty, 1986) and a theory of measurement (Saaty, 1990). It has been proposed as a decision analysis technique to evaluate complex multi-attribute alternatives among one or more

decision-makers. It structures an overall objective linked to a group of criteria and a group of alternatives as shown in Figure 5.

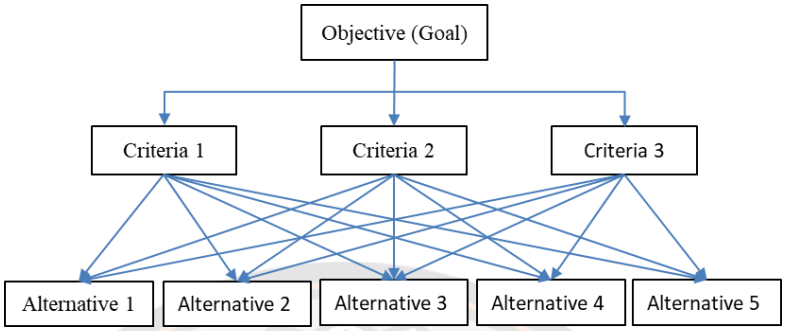



**Figure 5 AHP Structure**

AHP can be applied in prioritization, choice, ranking, resource allocation, benchmarking, quality management, and conflict resolution when the decision-maker has multiple alternatives and criteria. Moreover, application of AHP can establish hierarchy structure, construct the pairwise comparison judgment matrix of the decision elements, and then check for consistency, capture priorities from the matrix (Salgado et al., 2012). Pairwise comparison has the advantage of only focusing on two objects at a time and study the relationship of each other. The complex problem can be solved by taking consideration of the feeling and logic together by the experts in the related field (Garuti & Salomon, 2012; Salgado et al., 2012).

A case study is found applying Analytic Hierarchy Process to identify the influence level of all critical success factors and examine the effect in order to improve the performance of China-Thailand cross-border e-commerce freight forwarder effectively (Sun & Watanabe, 2017). In developing a strategic heritage building performance procedure in Malaysia, the criteria and attributes for assessing defects are identified in AHP to monitor and improve the process of defect elements which is very complex for a heritage building involving consideration of many different factors, such as building use, structural durability, building components, financial, building condition assessment, and others (Zuraidi et al., 2018). A similar example of applying AHP is that in order to establish the appropriate management procedures for most productive use of labour resources in construction

projects in Melbourne, the factors and their relative importance impacting on workers' productivity are investigated by using a structured questionnaire survey approach (Doloi, 2008). Another case study in Napal organizes in a framework of five criteria (factors) related to sub-criteria as well as embedded elements and five alternatives (scale of Hydropower) and after the subjective judgment of the pairwise comparison made in Saaty's scores by the stakeholders, the ranking and most appropriate scale of hydropower schemes can be recommended for the country based on considering social, economic, environmental, political and technical issues (Singh & Nachtnebel, 2016).

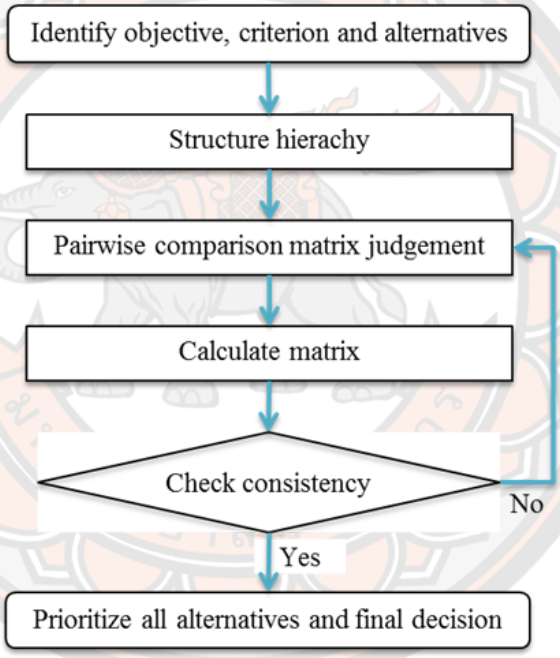



**Figure 6 AHP procedure**

Figure 6 illustrates AHP procedure and in scoring pairwise comparison judgment by experts, Saaty's 9 weight scores are used according to their importance level. In comparison, if the compared two factors are equally important, the score is 1. If a factor is more important the another, the weight score 3 is used. Then, a strongly more important level is 5 and a very strongly more important level, 7, absolutely more important level, 9 respectively. The weight scores of 2, 4, 6, and 8 are used for compromise between slightly differing judgments. The judgment is validated with a

consistency check which is allowed within the consistency ration (CR) value of 0.1 or 10%.

# CHAPTER III

# METHODOLOGY

Prior to interview task, discussions were held with the building professional to assure the 20 factors from existing literature used in this study are relevant to the context of the scope. This study applied a multiple research approach involving a semi-structured interview and a questionnaire survey. Hence data was collected in 2 phases - (1) collection of interview data for factor identification and (2) collection of questionnaire survey data which was started on completion of phase 1. The sample selection was based on the criteria that professionals are at the administrative and managerial levels in the residential construction field with more than 5 years of work experience. They answered the interview questions and score the quantitative questionnaires based on their expertise in the construction field. Throughout the data collection, total 30 professionals had been successfully arranged for their participation in this study – 20 professionals in phase 1 and 30 professionals in phase 2. They were 5 material suppliers, 5 contractors, 5 developers, 5 building designers, 5 professionals from academia/consulting and 5 members of city development committee. With the collected interview and questionnaire data, AHP analysis is applied. In order to achieve the objectives of this research that identifies and prioritizes influential factors of sustainable construction in private residential sector in Yangon, 6 steps are illustrated as shown in Figure 7 and explained in detail.

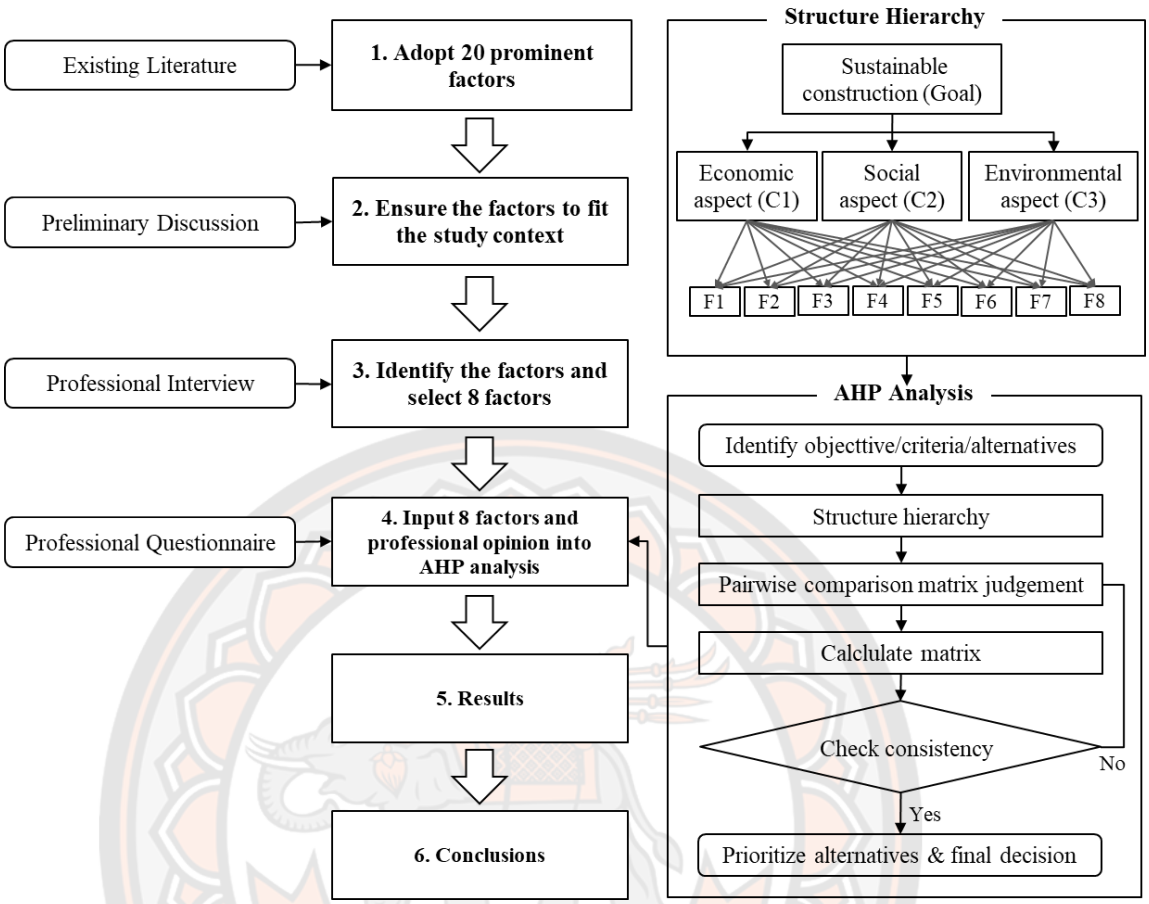



**Figure 7 Research flowchart**

Step 1: A review of the relevant literature was conducted to examine factors that influence on sustainable construction. Since the factors found to be sufficiently tested and used in similar studies in other countries and different contexts, in summary, 20 prominent factors were adopted for use in this study.

Step 2: Prior to the interview task, preliminary discussions were held with 4 professionals on the 20 factors that were adopted from the existing literature to ensure that the factors were applicable and fit to the context of the study. In the discussions, it was agreed that the factors, drivers and obstacles from the literature were adapted in the form of influential factors on sustainable construction related to context of the study. Then, the factors were included in the predetermined interview questions so that the professionals could make their consideration on identification of the factors in their interview.

Step 3: Semi-structured interviews were conducted with professionals based on critical success factors technique that was designed to determine the information most needed. During the spread of COVID-19, the interviews were arranged in the forms of online video and voice talk. A set of the predetermined questions (GoogleForm, 2022) were sent to each participant prior to interview. However, the questions were not fixed but allowing them to investigate different facets of the research question, give their suggestions and include their nominated factors. On completion of a series of interviews, the factors were identified for sustainable construction in the context of private residential sector in Yangon. Since then, 8 factors were selected with the highest frequency of identification of professionals in the majority (see in Table 5).

Step 4: In this step, the AHP process was applied in order to prioritize the selected 8 factors by means of their importance distributed across three elements of criteria (economic, social and environmental aspects) involving the questionnaires in which of the professionals gave their opinions on each pairwise comparison of the factors in weight scores. Detailed process in Step 4 is explained as follows:

(1) AHP structure was constructed by setting sustainable construction for objective, economic, environmental and social aspects, for criteria, and the selected 8 factors for alternatives respectively as shown in Figure 7.

(2) Pairwise comparison matrix was provided and scored in the professional questionnaire by using a nine-point scale which is presented by Thomas L. Saaty (Saaty, 1980).

**Table 1 Weight score of AHP for each pairwise comparison**

| Weight Score | Judgment of i factor against j factor where row of i meets column of j with reciprocal of each other |
|---|---|
| 1 | equally important |
| 3 | more important |
| 5 | strongly more important |
| 7 | very strongly more important |
| 9 | absolutely more important |
| 2,4,6,8 | Compromise between slightly differing judgments |

(3) Questionnaires (GoogleSheet, 2022) were sent to the professionals for making judgment on each pairwise comparison by providing them to input pairwise comparison judgments and force their reciprocals, and determine the priorities of the factors in one level with respect to their impact on the next level.

(4) From the questionnaire scores, the AHP data analysis was carried out.

The pairwise comparison matrix was prepared and normalized. The result of the normalization, matrix $a = [aij]$ was transformed into matrix $r = [r_{ij}]$. The elements of matrix are calculated according to the following formula:

$$r_{ij} = aij \Big/ \sum_{i=j}^{n} aij$$

The preference between the elements under investigation (prioritization vector; $w = [w_i]$) was calculated by the arithmetic averages from the row of the normalized comparison matrix. The components of the vector were calculated with the formula:

$$w_i = (1/n) \sum_{j=1}^{n} r_{ij}$$

The matrix A was built and priority vector was computed, which is the normalized eigenvector of the matrix. The priority vector shows relative weights among criteria or sub-criteria. The consistency of the comparison was checked with Consistency Index (CI) and Random Consistency Index (RI) and Consistency Ratio (CR) by considering $[A_X = \lambda_{max} X]$ where X is the eigenvector. The subjective judgment is consistent and accepted where CR value is between 0 to 0.1 or 0 to 10% (Saaty, 1980).

$$\lambda_{max} = \frac{\sum_{i=1}^{n} \frac{A_{X_i}}{X_i}}{n} \text{ , CI} = \frac{\lambda_{max} - n}{n-1}$$

where CI is the consistency index, $\lambda_{max}$ is the maximum eigenvalue, n is the size of the measured matrix, CR is the consistency ratio, CR = $\frac{CI}{RI}$ where CI is the consistency index and RI is the random consistency index. In this study, the RI value 1.41 was taken for 8 alternative factors and the RI value 0.58, for 3 criteria (economic, social, and environmental aspects)

**Table 2 RI value table**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0.58 | 0.9 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.49 |

If CR results in inconsistency, the respondents need to revise their judgment scores until CR value is between 0 to 0.1.

Step 5: Results: On completion of AHP data analysis, findings were obtained and discussed regarding the objectives of the study.

Step 6: Conclusions: The key finding was discussed in comparison to the previous existing studies. Suggestions and advantages of this study were proposed. Finally, by stating limitations of this study, an extensive future work was recommended.

# CHAPTER IV

# RESULTS

This chapter proceeds to report the findings from analysis of the collected data and the application of the proposed method. Firstly, it explains how data collection was carried out and describes the characteristic of informants. Then, the frequency of the influential factors identification for sustainable construction industry in the study context are reported from the professionals' perspectives which were answered in their interview questions. Afterward, the most influential 8 factors are selected by considering the highest frequency of identification priority. For better understanding of sustainable construction situation in Myanmar, the discussions of the professionals on the influential factors in the interview are included as well. In the process of AHP application, the pairwise comparison matrix calculation is presented. Along the process of analysis, the professionals' perceptions toward the three elements of sustainability are discussed. Then each of pairwise comparison factor weight in economic, social and environmental aspects is summarized respectively. Lastly, summary of weight of the influential factors and the final results of the influential factors' ranking are reported and discussed. Extensively, the influential factor weight distributed across three aspects of sustainability is reported.

A series of data processing components are included in detail in the appendix – (A) Interview Questions for a Master Thesis (online and offline), (B) Questionnaire for Analytic Hierarchy Process (online GoogleSheet and off-line MSExcel) and (C) AHP Data Analysis for Each of Respondent 1 to Respondent 30.

**Data Collection and Characteristic of Informants**

According to flowchart in methodology in step 3, the phase 1 data collection is related to interview for factor identification. The participation invitations were sent online to the eligible professionals in the engineering alumni batch group with 106 members and the residential builders' group with 68,856 members on Facebook, and by name directly to 34 members of Federation of Federation of Myanmar Engineering

Societies. There were 20 numbers of professionals reached and available to answer the interviews online within the planned time that travelling was impossible and communications were difficult under the paralyzed situation during Covid-19 pandemic and the coup. They were 2 material suppliers, 4 contractors, 5 developers, 3 building designers, 4 from academia/consulting and 2 from city development committee. The answers to the identification of factors in interview questions was collected on an online form (GoogleForm, 2022) from 19 professionals and by receiving email from 1 professional.

The phase 2 data collection is survey questionnaire for AHP analysis. On completion of data collection from the interview answer of phase 1, the highest frequency of 8 factors were summarized. Then, the questionnaires were prepared with those 8 factors for AHP analysis in order to find out the influential factors ranking. The questionnaires were sent to the same sources of informant in phase 1 and directly to the 20 interviewed professionals by email or via online Messenger chat. Total 30 questionnaires were completed in phase 2 – by 5 material suppliers, 5 contractors, 5 developers, 5 building designers, 5 from academia/consulting and 5 from city development committee – on online Google sheets of 27 professionals and in MSExcel sheets of 3 professionals. All the 30 questionnaires were received with the valid consistency check (CR value is within 0 and 0.1). In case of resulting the CR value out of the allowed range, the professional was requested to revise his judgment score of pairwise comparison again until meeting a valid consistency check.

According to the criteria that target the top management level with more than 5 years' work experience in the related residential construction area, the professionals were chosen to participate in this study. The characteristic of overall 30 professionals for the private residential construction sector in Yangon city are described in Table 3 categorized in 6 groups - 5 material suppliers, 5 contractors, 5 developers, 5 building designers, 5 from academia/consulting and 5 from city development committee. Overall work experience of the participant professionals comprises 10% of 5-10 years, 17% of 11-15 years, 27% of 16-20 years and 46% of over 20 years of experience respectively as shown in Figure 8.

**Table 3 Characteristic of Informants**

| Group | No. | Position | Work experience (years) | Preliminary discussion | Interview for factor selection (phase 1) | Questionnaire for AHP ranking (phase 2) |
|---|---|---|---|---|---|---|
| Material supplier | 1 | Managing Director | 5 to 10 | | | / |
| | 2 | Managing Director | 11 to 15 | | / | / |
| | 3 | General Manager | 16 to 20 | / | / | / |
| | 4 | Owner | > 20 | | | / |
| | 5 | Owner | > 20 | | | / |
| Contractor | 1 | Construction Site Engineer | 5 to 10 | | / | / |
| | 2 | Professional Engineer | 5 to 10 | | | / |
| | 3 | Owner/Managing Director | > 20 | / | / | / |
| | 4 | Supervisor | > 20 | | / | / |
| | 5 | Managing Director | > 20 | | / | / |
| Developer | 1 | Director | 11 to 15 | | / | / |
| | 2 | Director | 11 to 15 | | / | / |
| | 3 | Planning Engineer | 16 to 20 | | / | / |
| | 4 | General manager | 16 to 20 | / | / | / |
| | 5 | CEO | > 20 | | / | / |
| Designer | 1 | Design Engineer | 11 to 15 | | / | / |
| | 2 | Architect | 11 to 15 | | | / |
| | 3 | Resident Engineer | 16 to 20 | | / | / |
| | 4 | Senior Architect | > 20 | | / | / |
| | 5 | Founder | > 20 | | | / |
| Academia /Consulting | 1 | Professor, Civil Eng. Dept. | 16 to 20 | | / | / |
| | 2 | Managing Director | 16 to 20 | / | / | / |
| | 3 | Civil Engineer | 16 to 20 | | / | / |
| | 4 | Founder | 16 to 20 | | | / |
| | 5 | Director | > 20 | | / | / |
| City development committee | 1 | Assistant Engineer | > 20 | | / | / |
| | 2 | District Officer | > 20 | | / | / |
| | 3 | Executive Engineer | > 20 | | | / |
| | 4 | Executive Engineer | > 20 | | | / |
| | 5 | Executive Engineer | > 20 | | | / |
| Total | 30 | Professionals | | 4 | 20 | 30 |

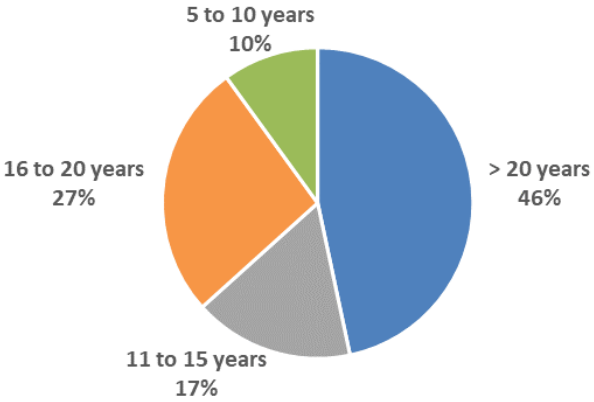



**Figure 8 Overall work experience of the participant professionals**

**Factor Identification and Discussion of Building Professionals**

Prior to the interviews, preliminarily, discussions were held with 4 professionals on the 20 factors that were adopted from the existing literature to ensure that the factors were applicable and fit to the context of the study. Then, the factors were included in the interview questions before all 20 professionals could make their consideration on identification of the factors in their interview.

In a series of interviews, based on the professional expertise in the field, the influential factors on sustainable construction were discussed in the context of the study and each factor was considered for identification. In the interview questions, although the professionals were provided to suggest new factors based on their certain experience for an extension to the included ones, there were no additional factors recommended by the interviewed professionals. On completion of interview process, the frequency of factor identification was summarized as shown in Table 4.

**Table 4 The factors identified by the professionals in the interview questions**

| Professionals | Factors: | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 6 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 11 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 15 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 16 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 18 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 19 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 20 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Frequency | 17 | 13 | 13 | 14 | 17 | 13 | 12 | 15 | 14 | 15 | 15 | 14 | 16 | 13 | 15 | 13 | 11 | 14 | 13 | 13 |
| | 85% | 65% | 65% | 70% | 85% | 65% | 60% | 75% | 70% | 75% | 75% | 70% | 80% | 65% | 75% | 65% | 55% | 70% | 65% | 65% |

Note: 1 = The factor was identified by the professional

0 = The factor was not identified by the professional

Table 5 reiterates the frequency of factor identification in Table 4 with full factor name and indicates the selected 8 factors according to their highest frequency priority, which were subsequently carried over to use in the process of AHP analysis involving the questionnaires of 30 respondents.

**Table 5 Summary of the factors identified by the professionals**

| No. | Full factor name | Frequency | Selected | Factor |
|---|---|---|---|---|
| 1 | "Design" | 85.00% | / | F1 |
| 2 | "Cost premium of green building project" | 65.00% | | |
| 3 | "3Rs system (reduce/reuse/recycle) at the level of enterprise strategy" | 65.00% | | |
| 4 | "Superlative communication and interest among project team members" | 70.00% | | |
| 5 | "Expertise and knowledge in green building" | 85.00% | / | F2 |
| 6 | "Managers and professionals strictly follow green construction practices framework" | 65.00% | | |
| 7 | " Interest from client and market demand" | 60.00% | | |
| 8 | "Overcoming resistance to change from conventional to green practices by company's employees" | 75.00% | / | F4 |
| 9 | "Government support (incentives) for sustainable construction" | 70.00% | | |
| 10 | "Credible research on the benefits of green buildings" | 75.00% | / | F5 |
| 11 | "Political stability" | 75.00% | / | F6 |
| 12 | "Policies and regulations" | 70.00% | | |
| 13 | "Resource management (water; energy)" | 80.00% | / | F3 |
| 14 | "Embrace of sustainable technologies" | 65.00% | | |
| 15 | "Application of lean construction" | 75.00% | / | F7 |
| 16 | "Environment management (noise control; the improvement of surrounding environment)" | 65.00% | | |
| 17 | "Promoting a sustainable mind-set and culture across organization" | 55.00% | | |
| 18 | "Developing sustainable awareness of clients" | 75.00% | / | F8 |
| 19 | "Cost of green building practice implementation" | 65.00% | | |
| 20 | "Incentive mechanism for project team members" | 65.00% | | |

Selected factor 1 (F1): There are 85.0% of interviewees believe that “Design” is the key factor for sustainable construction. Design is the earliest phase of construction where sustainable implementation should start. Sustainable building design begins with the proper site selection, including the existing building’s rehabilitation. The location, orientation, and landscaping of a building all affect local ecosystems, transportation methods, and energy use. Good design optimizes energy use. It can help protect and reserve water providing to use water efficiently, and reuse or recycle water for on-site use. Good design optimizes building space and material use. It enhances indoor environmental quality. Specifications of proper materials and systems also optimize operation and maintenance.

Selected factor 2 (F2): At the same time, there are 85.0% of interviewees regard that "Expertise and knowledge in green building" is a prominent factor for sustainable construction. The interviewees pay attention on having experts, experienced professionals and consultancy services which are essentially needed in green building.

Selected factor 3 (F3): There are 80.0% of interviewees agree that “Resource management (water; energy)” is an important factor for sustainable construction. They remark that among life cycle phases of residential building, major energy is consumed during building operation (43% of all energy delivered). A study shows that a managed building can reduce 32.4% of energy use and 55.4% water consumption rates (by improving thermal insulation of the external walls and roofs; more efficient glazing; fitting external shading devices; and fitting energy-efficient fluorescent lighting. Suggested water conservation management includes the use of low-flow taps in kitchens and bathrooms; low-flow showerheads; efficient washing machines; and the installation of a grey water system)

Selected factor 4 (F4): There are 75.0% of interviewees agree that “Overcoming resistance to change from conventional to green practices by company's employees” is an important factor for sustainable construction. They worry that traditional perception of how to build a building is still dominant.

Selected factor 5 (F5): There are 75.0% of interviewees agree that “Credible research on the benefits of green buildings” is an important factor for sustainable construction. They mention needs to improve r & d in products and technologies for green buildings.

Selected factor 6 (F6): There are 75.0% of interviewees consider that “Political stability” is an important factor for sustainable construction. They realize that only stable political condition can lead to stable economic development first and, social and environmental benefits will be following then.

Selected factor 7 (F7): There are 75.0% of interviewees regard that “Application of lean construction” is an important factor for sustainable construction that will improve economic benefit by means of time and cost.

Selected factor 8 (F8): There are 75.0% of interviewees regard that “Developing sustainable awareness of clients” is an important factor for sustainable construction that is needed to promote for market-driven sustainability.

It is found that the identified factors are with an effect on the economic aspect most while all the balanced aspects of economy, society and environment are needed in sustainable development. However, it is still applicable to the AHP structure of this study which is based on a holistic approach assuming each factor as an alternative can have the effects on the 3 criteria of economic, social and environmental aspects by not providing categorized criteria for directly related factors only. For example, a good conventional design saves money to build economically but a sustainable design cost highly. It brings safety and wellness socially, and saves energy and resources environmentally. In case of limitation in making pairwise comparison judgment under a certain criterion where the professional decided that the factors are not related to, it would have been scored 1 for ‘equally preferred’ as a solution.

In considering the situation of the sustainable construction industry in Myanmar and understanding the context of the study, the professionals' discussions from the interview were summarized as follows:

1. “Design”: The professionals discussed that design stage is one of the preliminary one of considering design of the building and designer should consider the ways of idea to be sustainable building design based on the proper criteria, which are collected during feasibility survey for the building to be constructed. But, the architect or designer, who has inspiration of sustainable construction, is very rare in Myanmar. From the professional’s point of view, such kinds of practice may never be used to utilize during designing before, but some designer may have learnt and know about green house and they can follow during their design, if in case of the request of the client. Moreover, prefabricating material are advised to use in design considering and as an obstacle, a lack of sustainable architects is discussed. Finally, local authority should help in sustainable design implementation accordingly.

2. "Cost premium of green building project": Its importance is remarked but the professional explained that it may be difficult for people in developing country, Myanmar because most of rich people, strong customers, prefer to cost for the good

architectural feature of the building and decoration especially, meaning they want to use branded and standard products in their buildings for better facilities. They don't consider for the green house to be optimized the ecosystem and also prefer to cost for it, even their architect or designer, who have well knowledge about greenhouse & prefers, advised regarding it. Sometime, existing situations don't attract them to consider for greenhouse design. So far, green building concept does not work in the local market of price-oriented culture for developing country.

3. "3Rs system (reduce/reuse/recycle) at the level of enterprise strategy": Many professionals answered "No" for it for the reason that people have not much knowledge of 3Rs and also not much familiar with recycle materials. But some consider to reduce power consumption for the utilization of those such as air-condition, washing machine and etc. and some MEP designer never advises about those. But some customers just request MEP designer to consider and fix the electrical wire lines separately for lighting and power line. Now, it becomes familiar and considered for the condominium projects and housing projects by foreign architects or designer under the foreign developers. The recycle business is not growing at this moment and there is a need of recycle chain in the ecosystem.

4. "Superlative communication and interest among project team members": The professional expressed not much knowledge and practices before among them and did not give an important weight for it.

5. "Expertise and knowledge in green building": It will be perfect, if all experts and professionals and consultancy services participate in the captioned project. In Myanmar, there may be experts, but rare. Sometime oversea graduated & experienced engineers or architect relating green building may have kinds of practice and idea of designing & supervision. Moreover, it is seen as an the extra as well.

6. "Managers and professionals strictly follow green construction practices framework": No much discussion but a professional believes that Law and regulation must be enforced.

7. " Interest from client and market demand": It is commented that it will be difficult to make attraction to the client to get interest in Myanmar. Such kind of market is also very newly in Myanmar.

8. "Overcoming resistance to change from conventional to green practices by company's employees": It needs to be educated and introduced with them first, if there is a plan of green buildings in the project. Afterward, they could follow properly by passing over the obstacles such as unfamiliar perception and practice.

9. "Government support (incentives) for sustainable construction": It may be averagely in Myanmar because government never supported with any scheme particularly for sustainable construction. The concerns are raised if without the readiness the robust money laundry prevention law and real estate business law.

10. "Credible research on the benefits of green buildings": It will be necessary to improve research and development in products and technologies for green buildings and it also need to introduce its concept and utilization by educating and explaining the advantages to be well known by the people especially clients.

11. "Political stability": Majority of the professionals agree that it is very important for the construction development industry because it cannot be conducted without political stability and economic growth of the country. It is depending as main a high-impact external factor.

12. "Policies and regulations": It depends on the interest of City Development Committees of each city (YCDC), especially in Yangon and also on the housing board under the ministry of construction. Most of the policies and regulations are done by those two organizations recently. Now, Myanmar Engineering Council (MEC), Myanmar Architects Council (MAC) & Committee for Quality Control of High-Rise Buildings (CQHP) have raised their concerns over preparing policies and regulations regarding constructions.

13. "Resource management (water; energy)": It would be better, if it could be designing the buildings with the concept of resource management and it would be advantageous to the people not only in the country but also in the world for environmental conservation and good-living lives of the people. Concept and products introduction from oversea country are needed as well.

14. "Embrace of sustainable technologies": Mostly no discussion but some feel it is too early to embrace so far.

15. "Application of lean construction": Nowadays, it is reported that there are some construction sites operate accordingly.

16. "Environment management (noise control; the improvement of surrounding environment)": Few discussions but priority of construction waste management is recommended.

17. "Promoting a sustainable mind-set and culture across organization": No discussion

18. "Developing sustainable awareness of clients": No discussion

19. "Cost of green building practice implementation": No discussion

20 "Incentive mechanism for project team members": No discussion

In overall summary, there are still requirements in every aspect sustainable development among the clients, builders and the government role. It confirms that the residential construction is still at the beginning stage.

**Application of AHP Analysis**

By the application of the proposed methodology in Step 4, the collected questionnaire data from Respondent 1 to Respondent 30 was input and processed in AHP analysis related to the criteria (economic, social and environmental aspects) and alternatives (8 selected factors). After pairwise comparison matrix was provided and scored in the professional questionnaire by using Saaty's nine-point scale, a series of analysis for each of 30 respondents is included in the APPENDIX C. On completion of calculation for all questionnaire data, the results of the AHP analysis are undermentioned accordingly.

**Weight of Criteria Based on Three Elements of Sustainability**

Table 6 indicates the weight of criteria on completion of AHP analysis. According to the AHP model constructed in this study, the professionals had to make the judgment and give the scores for the criteria which were set with economic, social and environmental aspects before going to give the scores for the pairwise comparison of the factor. It is not only one of the analysis processes, but in this point how the professionals had made their judgments also indicates their perceptions toward the three elements of sustainability (economy, society and environment).

**Table 6 The professional's perceptions towards the three elements of sustainability (Criteria)**

| Respondents | Economy | Society | Environment | CR |
|---|---|---|---|---|
| 1 | 0.633 | 0.260 | 0.106 | 0.03 |
| 2 | 0.714 | 0.143 | 0.143 | 0.00 |
| 3 | 0.600 | 0.200 | 0.200 | 0.00 |
| 4 | 0.261 | 0.411 | 0.328 | 0.05 |
| 5 | 0.400 | 0.400 | 0.200 | 0.00 |
| 6 | 0.490 | 0.312 | 0.198 | 0.05 |
| 7 | 0.333 | 0.333 | 0.333 | 0.00 |
| 8 | 0.589 | 0.252 | 0.159 | 0.05 |
| 9 | 0.600 | 0.200 | 0.200 | 0.00 |
| 10 | 0.429 | 0.429 | 0.143 | 0.00 |
| 11 | 0.411 | 0.328 | 0.261 | 0.05 |
| 12 | 0.200 | 0.200 | 0.600 | 0.00 |
| 13 | 0.600 | 0.200 | 0.200 | 0.00 |
| 14 | 0.539 | 0.297 | 0.164 | 0.01 |
| 15 | 0.400 | 0.400 | 0.200 | 0.00 |
| 16 | 0.333 | 0.333 | 0.333 | 0.00 |
| 17 | 0.525 | 0.142 | 0.334 | 0.05 |
| 18 | 0.714 | 0.143 | 0.143 | 0.00 |
| 19 | 0.714 | 0.143 | 0.143 | 0.00 |
| 20 | 0.328 | 0.261 | 0.411 | 0.05 |
| 21 | 0.589 | 0.159 | 0.252 | 0.05 |
| 22 | 0.429 | 0.143 | 0.429 | 0.00 |
| 23 | 0.400 | 0.400 | 0.200 | 0.00 |
| 24 | 0.211 | 0.548 | 0.241 | 0.02 |
| 25 | 0.405 | 0.480 | 0.115 | 0.03 |
| 26 | 0.490 | 0.312 | 0.198 | 0.05 |
| 27 | 0.548 | 0.211 | 0.241 | 0.02 |
| 28 | 0.633 | 0.260 | 0.106 | 0.03 |
| 29 | 0.170 | 0.387 | 0.443 | 0.02 |
| 30 | 0.490 | 0.198 | 0.312 | 0.05 |
| Summarized weight | 0.473 | 0.283 | 0.244 | |

Note: Summarized weight is arithmetic mean value and CR, consistency ratio.

The summarized weight shows that the perceptions of the professions are in favor of economy at 0.473 (47.3%) compared to 0.283 (28.3%) of society and 0.244 (24.4%) of environment respectively.

**Weight of Factors in Economic, Social and Environmental aspects**

On completion of AHP data analysis of pairwise comparison matrix in economic aspect, the factor weight of all respondents is shown in Table 7

**Table 7 Weight of factors: Economic aspect**

| Respondents | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | CR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.160 | 0.048 | 0.035 | 0.052 | 0.071 | 0.381 | 0.071 | 0.182 | 0.09 |
| 2 | 0.132 | 0.132 | 0.080 | 0.090 | 0.115 | 0.119 | 0.146 | 0.186 | 0.09 |
| 3 | 0.128 | 0.107 | 0.107 | 0.116 | 0.169 | 0.104 | 0.141 | 0.128 | 0.07 |
| 4 | 0.187 | 0.085 | 0.171 | 0.070 | 0.029 | 0.390 | 0.039 | 0.029 | 0.10 |
| 5 | 0.127 | 0.062 | 0.184 | 0.113 | 0.075 | 0.080 | 0.105 | 0.255 | 0.10 |
| 6 | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 | 0.10 |
| 7 | 0.087 | 0.120 | 0.094 | 0.128 | 0.159 | 0.115 | 0.165 | 0.132 | 0.09 |
| 8 | 0.108 | 0.127 | 0.095 | 0.144 | 0.162 | 0.224 | 0.055 | 0.085 | 0.09 |
| 9 | 0.151 | 0.040 | 0.033 | 0.058 | 0.061 | 0.402 | 0.092 | 0.163 | 0.08 |
| 10 | 0.122 | 0.084 | 0.110 | 0.138 | 0.058 | 0.331 | 0.037 | 0.119 | 0.08 |
| 11 | 0.151 | 0.068 | 0.096 | 0.116 | 0.182 | 0.181 | 0.150 | 0.055 | 0.10 |
| 12 | 0.145 | 0.052 | 0.139 | 0.130 | 0.032 | 0.403 | 0.048 | 0.052 | 0.10 |
| 13 | 0.068 | 0.097 | 0.095 | 0.061 | 0.153 | 0.381 | 0.043 | 0.101 | 0.10 |
| 14 | 0.076 | 0.194 | 0.131 | 0.084 | 0.159 | 0.062 | 0.178 | 0.115 | 0.08 |
| 15 | 0.106 | 0.053 | 0.038 | 0.055 | 0.082 | 0.379 | 0.095 | 0.191 | 0.09 |
| 16 | 0.153 | 0.064 | 0.190 | 0.102 | 0.023 | 0.409 | 0.027 | 0.032 | 0.11 |
| 17 | 0.128 | 0.081 | 0.125 | 0.117 | 0.022 | 0.437 | 0.047 | 0.043 | 0.09 |
| 18 | 0.203 | 0.045 | 0.057 | 0.060 | 0.066 | 0.298 | 0.069 | 0.202 | 0.06 |
| 19 | 0.079 | 0.089 | 0.079 | 0.042 | 0.079 | 0.477 | 0.061 | 0.096 | 0.06 |
| 20 | 0.136 | 0.114 | 0.057 | 0.099 | 0.145 | 0.124 | 0.209 | 0.114 | 0.10 |
| 21 | 0.140 | 0.090 | 0.139 | 0.096 | 0.035 | 0.430 | 0.030 | 0.040 | 0.09 |
| 22 | 0.151 | 0.040 | 0.033 | 0.058 | 0.061 | 0.402 | 0.092 | 0.163 | 0.08 |
| 23 | 0.111 | 0.153 | 0.228 | 0.098 | 0.077 | 0.102 | 0.091 | 0.140 | 0.10 |
| 24 | 0.140 | 0.090 | 0.139 | 0.096 | 0.035 | 0.430 | 0.030 | 0.040 | 0.09 |
| 25 | 0.105 | 0.103 | 0.119 | 0.135 | 0.029 | 0.413 | 0.041 | 0.056 | 0.10 |
| 26 | 0.209 | 0.071 | 0.039 | 0.053 | 0.121 | 0.274 | 0.056 | 0.177 | 0.08 |
| 27 | 0.163 | 0.055 | 0.042 | 0.041 | 0.119 | 0.354 | 0.057 | 0.168 | 0.07 |
| 28 | 0.079 | 0.080 | 0.062 | 0.065 | 0.215 | 0.218 | 0.144 | 0.137 | 0.10 |
| 29 | 0.059 | 0.104 | 0.106 | 0.123 | 0.215 | 0.056 | 0.202 | 0.135 | 0.09 |
| 30 | 0.119 | 0.117 | 0.067 | 0.065 | 0.063 | 0.436 | 0.026 | 0.107 | 0.10 |
| Summarized weight | 0.127 | 0.088 | 0.100 | 0.089 | 0.096 | 0.294 | 0.087 | 0.119 | |

Note: Summarized weight is arithmetic mean value and CR, consistency ratio. CR value of the Respondent 16 is 0.11 which is 0.01 greater than the preferred maximum 0.10 and assumed there is no effect on output result.

Correspondingly, on completion of AHP data analysis of pairwise comparison matrix in social aspect, the factor weight of all respondents is shown in Table 8.

**Table 8 Weight of factors: Social aspect**

| Respondents | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | CR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.098 | 0.073 | 0.029 | 0.053 | 0.099 | 0.433 | 0.055 | 0.161 | 0.09 |
| 2 | 0.156 | 0.062 | 0.046 | 0.060 | 0.108 | 0.360 | 0.070 | 0.138 | 0.09 |
| 3 | 0.235 | 0.052 | 0.035 | 0.076 | 0.127 | 0.321 | 0.042 | 0.111 | 0.10 |
| 4 | 0.163 | 0.064 | 0.033 | 0.052 | 0.097 | 0.333 | 0.098 | 0.160 | 0.09 |
| 5 | 0.116 | 0.110 | 0.116 | 0.104 | 0.141 | 0.126 | 0.116 | 0.172 | 0.08 |
| 6 | 0.078 | 0.107 | 0.044 | 0.038 | 0.085 | 0.438 | 0.077 | 0.133 | 0.09 |
| 7 | 0.064 | 0.103 | 0.113 | 0.110 | 0.148 | 0.136 | 0.125 | 0.203 | 0.09 |
| 8 | 0.080 | 0.191 | 0.113 | 0.059 | 0.196 | 0.127 | 0.095 | 0.139 | 0.09 |
| 9 | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 | 0.10 |
| 10 | 0.100 | 0.141 | 0.073 | 0.207 | 0.055 | 0.116 | 0.151 | 0.157 | 0.07 |
| 11 | 0.134 | 0.079 | 0.080 | 0.052 | 0.158 | 0.089 | 0.153 | 0.255 | 0.09 |
| 12 | 0.168 | 0.033 | 0.087 | 0.087 | 0.044 | 0.399 | 0.026 | 0.156 | 0.07 |
| 13 | 0.105 | 0.123 | 0.046 | 0.136 | 0.065 | 0.429 | 0.024 | 0.073 | 0.10 |
| 14 | 0.192 | 0.095 | 0.032 | 0.061 | 0.147 | 0.337 | 0.039 | 0.096 | 0.07 |
| 15 | 0.085 | 0.268 | 0.052 | 0.072 | 0.190 | 0.168 | 0.077 | 0.088 | 0.09 |
| 16 | 0.139 | 0.048 | 0.075 | 0.066 | 0.053 | 0.448 | 0.024 | 0.147 | 0.11 |
| 17 | 0.185 | 0.065 | 0.075 | 0.057 | 0.062 | 0.378 | 0.022 | 0.156 | 0.08 |
| 18 | 0.079 | 0.080 | 0.062 | 0.065 | 0.215 | 0.218 | 0.144 | 0.137 | 0.10 |
| 19 | 0.066 | 0.104 | 0.093 | 0.043 | 0.079 | 0.479 | 0.068 | 0.068 | 0.05 |
| 20 | 0.085 | 0.064 | 0.071 | 0.052 | 0.127 | 0.369 | 0.051 | 0.181 | 0.08 |
| 21 | 0.129 | 0.081 | 0.049 | 0.047 | 0.056 | 0.319 | 0.091 | 0.229 | 0.08 |
| 22 | 0.116 | 0.152 | 0.102 | 0.081 | 0.151 | 0.086 | 0.099 | 0.214 | 0.08 |
| 23 | 0.136 | 0.049 | 0.169 | 0.072 | 0.054 | 0.376 | 0.025 | 0.120 | 0.10 |
| 24 | 0.065 | 0.067 | 0.038 | 0.151 | 0.070 | 0.267 | 0.073 | 0.269 | 0.09 |
| 25 | 0.104 | 0.109 | 0.093 | 0.091 | 0.082 | 0.422 | 0.029 | 0.069 | 0.10 |
| 26 | 0.115 | 0.062 | 0.117 | 0.099 | 0.061 | 0.352 | 0.026 | 0.167 | 0.08 |
| 27 | 0.068 | 0.097 | 0.095 | 0.061 | 0.153 | 0.381 | 0.043 | 0.101 | 0.10 |
| 28 | 0.138 | 0.067 | 0.038 | 0.064 | 0.097 | 0.360 | 0.055 | 0.181 | 0.10 |
| 29 | 0.057 | 0.094 | 0.128 | 0.163 | 0.268 | 0.069 | 0.115 | 0.105 | 0.09 |
| 30 | 0.059 | 0.085 | 0.186 | 0.078 | 0.140 | 0.224 | 0.137 | 0.092 | 0.09 |
| Summarized weight | 0.114 | 0.094 | 0.080 | 0.081 | 0.113 | 0.299 | 0.074 | 0.146 | |

Note: Summarized weight is arithmetic mean value and CR, consistency ratio.

CR value of the Respondent 16 is 0.11 which is 0.01 greater than the preferred maximum 0.10 and assumed there is no effect on output result.

Furthermore, on completion of AHP data analysis of pairwise comparison matrix in environmental aspect, the factor weight of all respondents is shown in Table 9

**Table 9 Weight of factors: Environmental aspect**

| Respondents | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | CR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.201 | 0.069 | 0.038 | 0.057 | 0.100 | 0.370 | 0.042 | 0.123 | 0.08 |
| 2 | 0.045 | 0.218 | 0.180 | 0.133 | 0.087 | 0.152 | 0.103 | 0.082 | 0.09 |
| 3 | 0.204 | 0.126 | 0.057 | 0.101 | 0.120 | 0.153 | 0.104 | 0.135 | 0.09 |
| 4 | 0.099 | 0.079 | 0.082 | 0.070 | 0.238 | 0.105 | 0.176 | 0.150 | 0.09 |
| 5 | 0.070 | 0.084 | 0.100 | 0.195 | 0.189 | 0.100 | 0.165 | 0.097 | 0.08 |
| 6 | 0.087 | 0.114 | 0.197 | 0.051 | 0.079 | 0.345 | 0.059 | 0.068 | 0.09 |
| 7 | 0.101 | 0.087 | 0.121 | 0.171 | 0.156 | 0.116 | 0.116 | 0.132 | 0.11 |
| 8 | 0.104 | 0.109 | 0.093 | 0.091 | 0.082 | 0.422 | 0.029 | 0.069 | 0.10 |
| 9 | 0.119 | 0.140 | 0.067 | 0.038 | 0.146 | 0.265 | 0.147 | 0.077 | 0.10 |
| 10 | 0.112 | 0.104 | 0.149 | 0.111 | 0.117 | 0.117 | 0.174 | 0.117 | 0.08 |
| 11 | 0.100 | 0.113 | 0.173 | 0.075 | 0.220 | 0.100 | 0.105 | 0.113 | 0.09 |
| 12 | 0.135 | 0.160 | 0.139 | 0.106 | 0.095 | 0.157 | 0.093 | 0.114 | 0.08 |
| 13 | 0.045 | 0.218 | 0.180 | 0.133 | 0.087 | 0.152 | 0.103 | 0.082 | 0.09 |
| 14 | 0.118 | 0.153 | 0.082 | 0.140 | 0.162 | 0.109 | 0.096 | 0.142 | 0.10 |
| 15 | 0.162 | 0.086 | 0.184 | 0.056 | 0.091 | 0.249 | 0.075 | 0.097 | 0.09 |
| 16 | 0.108 | 0.104 | 0.074 | 0.084 | 0.080 | 0.446 | 0.024 | 0.080 | 0.11 |
| 17 | 0.223 | 0.110 | 0.088 | 0.129 | 0.113 | 0.060 | 0.115 | 0.162 | 0.10 |
| 18 | 0.227 | 0.110 | 0.058 | 0.068 | 0.069 | 0.282 | 0.040 | 0.145 | 0.07 |
| 19 | 0.045 | 0.087 | 0.077 | 0.044 | 0.168 | 0.450 | 0.064 | 0.064 | 0.10 |
| 20 | 0.074 | 0.144 | 0.111 | 0.181 | 0.082 | 0.113 | 0.084 | 0.209 | 0.09 |
| 21 | 0.109 | 0.104 | 0.065 | 0.114 | 0.192 | 0.154 | 0.114 | 0.149 | 0.10 |
| 22 | 0.126 | 0.211 | 0.095 | 0.142 | 0.135 | 0.126 | 0.064 | 0.099 | 0.09 |
| 23 | 0.067 | 0.156 | 0.044 | 0.117 | 0.126 | 0.387 | 0.027 | 0.075 | 0.09 |
| 24 | 0.134 | 0.109 | 0.064 | 0.110 | 0.096 | 0.384 | 0.026 | 0.078 | 0.09 |
| 25 | 0.234 | 0.040 | 0.060 | 0.108 | 0.065 | 0.292 | 0.034 | 0.167 | 0.10 |
| 26 | 0.136 | 0.118 | 0.072 | 0.105 | 0.110 | 0.396 | 0.029 | 0.035 | 0.09 |
| 27 | 0.179 | 0.046 | 0.113 | 0.068 | 0.047 | 0.372 | 0.023 | 0.152 | 0.10 |
| 28 | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 | 0.10 |
| 29 | 0.142 | 0.193 | 0.130 | 0.106 | 0.073 | 0.195 | 0.062 | 0.100 | 0.10 |
| 30 | 0.068 | 0.084 | 0.041 | 0.053 | 0.127 | 0.428 | 0.092 | 0.106 | 0.10 |
| Summarized weight | 0.122 | 0.119 | 0.101 | 0.101 | 0.117 | 0.246 | 0.082 | 0.111 | |

Note: Summarized weight is arithmetic mean value and CR, consistency ratio.

CR value of the Respondent 7 and Respondent 16 are 0.11 which is 0.01 greater than the preferred maximum 0.10 and assumed there is no effect on output result.

**Prioritized Factors**

On the completion of the application of AHP analysis to the scores of all 30 respondents, the influential weight scores of 8 factors are summarized as per their importance levels as shown in Table 10.

**Table 10 Summary of weight of the influential factors**

| Respondents | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.148 | 0.056 | 0.034 | 0.053 | 0.082 | 0.393 | 0.064 | 0.170 |
| 2 | 0.123 | 0.134 | 0.090 | 0.092 | 0.110 | 0.158 | 0.129 | 0.165 |
| 3 | 0.165 | 0.100 | 0.083 | 0.105 | 0.151 | 0.157 | 0.114 | 0.126 |
| 4 | 0.148 | 0.074 | 0.085 | 0.063 | 0.126 | 0.273 | 0.108 | 0.123 |
| 5 | 0.111 | 0.085 | 0.140 | 0.126 | 0.124 | 0.102 | 0.121 | 0.190 |
| 6 | 0.086 | 0.097 | 0.101 | 0.057 | 0.075 | 0.400 | 0.073 | 0.111 |
| 7 | 0.084 | 0.103 | 0.109 | 0.136 | 0.154 | 0.122 | 0.135 | 0.156 |
| 8 | 0.100 | 0.140 | 0.099 | 0.114 | 0.158 | 0.231 | 0.061 | 0.096 |
| 9 | 0.133 | 0.069 | 0.053 | 0.057 | 0.079 | 0.374 | 0.100 | 0.136 |
| 10 | 0.111 | 0.111 | 0.100 | 0.164 | 0.065 | 0.209 | 0.106 | 0.135 |
| 11 | 0.132 | 0.084 | 0.111 | 0.084 | 0.184 | 0.130 | 0.139 | 0.136 |
| 12 | 0.144 | 0.113 | 0.129 | 0.107 | 0.072 | 0.255 | 0.071 | 0.110 |
| 13 | 0.071 | 0.126 | 0.102 | 0.090 | 0.122 | 0.345 | 0.051 | 0.092 |
| 14 | 0.117 | 0.158 | 0.093 | 0.087 | 0.156 | 0.152 | 0.124 | 0.114 |
| 15 | 0.109 | 0.146 | 0.073 | 0.062 | 0.127 | 0.269 | 0.084 | 0.131 |
| 16 | 0.133 | 0.072 | 0.113 | 0.084 | 0.052 | 0.434 | 0.025 | 0.086 |
| 17 | 0.168 | 0.088 | 0.106 | 0.112 | 0.058 | 0.303 | 0.066 | 0.099 |
| 18 | 0.189 | 0.059 | 0.058 | 0.062 | 0.088 | 0.284 | 0.076 | 0.184 |
| 19 | 0.072 | 0.091 | 0.080 | 0.042 | 0.091 | 0.473 | 0.062 | 0.087 |
| 20 | 0.097 | 0.114 | 0.083 | 0.120 | 0.115 | 0.184 | 0.117 | 0.171 |
| 21 | 0.130 | 0.092 | 0.106 | 0.093 | 0.078 | 0.343 | 0.061 | 0.097 |
| 22 | 0.136 | 0.130 | 0.069 | 0.098 | 0.106 | 0.239 | 0.081 | 0.143 |
| 23 | 0.112 | 0.112 | 0.167 | 0.092 | 0.078 | 0.268 | 0.051 | 0.119 |
| 24 | 0.097 | 0.082 | 0.065 | 0.130 | 0.069 | 0.330 | 0.052 | 0.175 |
| 25 | 0.120 | 0.099 | 0.100 | 0.111 | 0.059 | 0.404 | 0.034 | 0.075 |
| 26 | 0.165 | 0.078 | 0.070 | 0.078 | 0.100 | 0.322 | 0.041 | 0.146 |
| 27 | 0.147 | 0.062 | 0.070 | 0.052 | 0.109 | 0.364 | 0.046 | 0.150 |
| 28 | 0.096 | 0.077 | 0.060 | 0.065 | 0.168 | 0.274 | 0.114 | 0.146 |
| 29 | 0.095 | 0.139 | 0.125 | 0.131 | 0.173 | 0.122 | 0.106 | 0.108 |
| 30 | 0.091 | 0.100 | 0.082 | 0.064 | 0.098 | 0.392 | 0.069 | 0.104 |
| Summarized wt. | 0.121 | 0.100 | 0.092 | 0.091 | 0.107 | 0.277 | 0.083 | 0.129 |
| Prioritized rank | 3 | 5 | 6 | 7 | 4 | 1 | 8 | 2 |

Note: Summarized weight is arithmetic mean value.

After consolidating weight of the influential factors, the final result of the influential factors' ranking with full factor name is shown in Table 11.

**Table 11 The final result of the influential factors' ranking.**

| Prioritized rank | Factor | Full factor name | Weight score | Weight score in % |
|---|---|---|---|---|
| 1 | F6 | Political stability | 0.277 | 27.7% |
| 2 | F8 | Developing sustainable awareness of clients | 0.129 | 12.9% |
| 3 | F1 | Design | 0.121 | 12.1% |
| 4 | F5 | Credible research on the benefits of green buildings | 0.107 | 10.7% |
| 5 | F2 | Expertise and knowledge in green building | 0.100 | 10.0% |
| 6 | F3 | Resource management (water; energy) | 0.092 | 9.2% |
| 7 | F4 | Overcoming resistance to change from conventional to green practices by company's employees | 0.091 | 9.1% |
| 8 | F7 | Application of lean construction | 0.083 | 8.3% |

"Political stability" has marked the most significant factors in the professionals' perspectives on sustainable construction in private residential sector in Yangon. It stands up at the score of 0.277 (27.7%) outperforming all the other factors.

The professionals believe that "Developing sustainable awareness of clients" is relatively most important – counts the score of 0.129 (12.9%) in the second most influential ranking while the third-ranked factor is "Design" with weight scores of 0.121 (12.1%).

Subsequently, the professionals have focused their consideration on "Credible research on the benefits of green buildings" – scores 0.107 (10.7%), "Expertise and knowledge in green building" – scores 0.100 (10.0%), "Resource management (water; energy)" – scores 0.092 (9.2%) and "Overcoming resistance to

change from conventional to green practices by company's employees" scores 0.91 (9.1%) respectively.

Meanwhile, the professionals have the least interest in "Application of lean construction" with the score of 0.083 (8.3%) for an influential factor on sustainable construction.

Extensively, the influential factors' weight distributed across three aspects of sustainability illustrates the professional perspectives towards sustainable construction as show in Table 12.

**Table 12 Influential factor weight distributed across three aspects of sustainability**

| Factor | Full factor name | Economic aspect | Social aspect | Environmental aspect | Overall |
|---|---|---|---|---|---|
| F1 | Design | 6.0% | 3.1% | 3.0% | 12.1% |
| F2 | Expertise and knowledge in green building | 4.2% | 2.7% | 3.1% | 10.0% |
| F3 | Resource management (water; energy) | 4.4% | 2.3% | 2.5% | 9.2% |
| F4 | Overcoming resistance to change from conventional to green practices by company's employees | 4.0% | 2.5% | 2.6% | 9.1% |
| F5 | Credible research on the benefits of green buildings | 4.6% | 3.2% | 2.9% | 10.7% |
| F6 | Political stability | 14.0% | 8.1% | 5.5% | 27.7% |
| F7 | Application of lean construction | 4.1% | 2.1% | 2.1% | 8.3% |
| F8 | Developing sustainable awareness of clients | 5.9% | 4.2% | 2.8% | 12.9% |
| Summary | | 47.3% | 28.3% | 24.4% | 100.0% |

By means of sustainability in construction, Table 12 indicates the professionals' firm belief in "Political stability" with the highest economic, social, and environmental impact. It implies that only in the condition of political stability, sustainable construction development is enabled.

Focusing on other considerable factors, from the professional's point of view, "Design" and "Developing sustainable awareness of clients" have significant

economic impact. In economic aspect, good conventional design can save cost but sustainable design cost highly. However, it has the long-term economic benefit as it optimizes water and energy use. Meanwhile, sustainable awareness of clients can enable and expand the sustainable markets in the industry.

Correspondingly, in professional's opinions, "Developing sustainable awareness of clients" and "Credible research on the benefits of green buildings" have dominant social impact. It is accepted that both sustainable awareness and benefits of green building will raise the popularity and interest in sustainable construction that enhance a safe and healthy living environment in the society.

Then, the professionals consider that "Expertise and knowledge in green building" and "Design" have prominent environmental impact as well. Expertise and knowledge in green building is expected to lead to successful sustainable implementation and practice, and effective allocation of resources or sustainable use of natural Resources. Besides, a sustainable design is energy-efficient and environment-friendly.

# CHAPTER V

# CONCLUSIONS

In achieving the objectives of the study, the 20 influential factors on sustainable construction industry in private residential sector in Yangon have been identified. Then, the selected 8 factors have been prioritized according to their influence level based on the results of AHP data analysis. Finally, the most influential factor has been found out. Extensively, the result of the influential factors' weight distributed across three aspects of sustainability illustrates the professional perspectives towards sustainable construction.

**Key Findings**

It indicates that the professionals have a strong perspective on "Political stability" which is the most significant factor on sustainable construction accounting for 27.7% of influential weight. While their concern about the political stability is strongly reflected, the professionals also pay attention to "Developing sustainable awareness of clients" which is relatively the most important with a weight score of 0.129 (12.9%). It implies that a need for awareness means a lack of awareness at the initial stage of sustainable construction. Only society of a high sustainable awareness is willing to pay for high-cost sustainable buildings or services, and the market demand will enable sustainable work or raise the builders' interest in green building.

Comparing the key finding related to the previous studies aforementioned for a broader view of this study area, it is found in accordance with "National political instability" which is the most influential challenge in implementing sustainable SCM in construction by (Zou & Soratana, 2017) while it varies from the key findings of other studies - "High cost premium of green building project" by (H. Bon-Gang, 2018), "financial problems (Mechanism of financial payments, project's adequate funds/resources), administrative aspects (Influence of client/client's representative, availability of experienced managers and skillful workforce), and the authorities' approval mechanisms (statutory approvals environment)" by (Gunduz & Almuajebh,

2020) and “Cultural change resistance, lack of government commitment, fear of higher investment costs, lack of professional knowledge, and lack of legislation respectively.” by (Ametepey et al., 2015). However, the majority of the studies shows that the dominant factors are mostly dealing with high impact on economy.

Similarly in this study, the professionals weighed 47.3% for economy, 28.3% for society and 24.4% for environment by means of importance to sustainable construction. It indicates that in general, the perceptions of building professionals have a tendency in favor of economic rather than social and environmental performance in terms of sustainability. Unsurprisingly, it confirms that the construction in Myanmar clearly remains a profit driven industry at present.

**Suggestions**

The influential factors prioritized in this study and the perspectives of the professionals will be beneficial to decision-makers and policy makers in developing sustainable strategies in construction in Myanmar so that resource allocation can be made efficiently. This study also contributes to the concept of sustainable construction and knowledge in the context of Myanmar.

Suggestion 1: Most importantly, it is suggested that a certain plan B or resilience plan should always be included in the strategies to deal with the political uncertainty.

Suggestion 2: Considerably, there should be programs to regularly promote sustainable awareness of clients and provide them with information about sustainability and the benefits of green building to enable market demand-driven sustainable construction. Subsequently, the government should provide low-interest or no-interest loans for green builders and buyers.

Suggestion 3: It is also suggested that design is the earliest process of construction and sustainable design can be introduced to interested or potential clients by convincing them the benefits they will be rewarded, such as harmless materials, safe and healthy indoor environmental quality, water and energy sufficiency, and long-term low maintenance and operation cost.

Suggestion 4: The credible research on development of products and technologies in green buildings should be advocated by subsidy from government.

Suggestion 5: Likewise, it is reported that in Myanmar there is a lack of expertise and knowledge in developing green building and thus foreign investment involving sustainable construction work, experienced professionals and consultancy services should be invited by offering certain incentives.

Suggestion 6: Among life cycle phases of residential building, major energy is consumed during building operation (43% of all energy delivered). A study shows that a managed building can reduce 32.4% of energy use and 55.4% water consumption rates. Hence, it is proposed to reduce energy consumption in houses by improving thermal insulation of the external walls and roofs, more efficient glazing, fitting external shading devices, and fitting energy-efficient fluorescent lighting. Moreover, water conservation management is suggested to include the use of low-flow taps in kitchens and bathrooms, low-flow showerheads, efficient washing machines, the installation of a grey water system, and incoming innovative materials and technologies.

Suggestion 7: It is recommended to overcome resistance to change from conventional to green practices by providing education and training, and considering green mark qualified awards which guarantee enhancement to company's reputation through publication and certifications. Because green construction is a very new concept in Myanmar construction industry, it is also suggested to start with a simple green building practice framework which can be followed easily to facilitate the transition from conventional to green practices.

Suggestion 8: It is highly suggested to apply lean practice in the conventional construction or integrates into sustainable construction as it is interested by most of professionals and has possibility of success in the context of early-stage sustainable construction of the study and lean application mainly includes operational improvement, waste elimination, environmental management and value-adding activities, high quality management of projects and supply chains, improved communications, and safety improvement, which will bring economic benefits and at the same time, social and environmental benefits as well.

Furthermore, decision-makers and policy makers from government and private sectors should always consider viable balance between economy and environment, equitable balance between economy and society, and bearable balance

between social and environment in terms of sustainability when drafting laws, rules and regulations in construction sector.

Finally, the contribution of all segments of clients, builders and government are required for a holistic approach of sustainable construction development in Myanmar.

**Future Work**

This study focused on a case study of private residential construction sector in Yangon only. There were unavoidable limitations in data collection during the pandemic COVID -19 and the coup d'état. An extensive study examining factors and their impacts in other construction sectors such as infrastructure, commercial and industrial sectors is recommended with a larger sample size so that the results are more generalized and robust to sustainable development in construction.

# REFERENCES

# REFERENCES


Ametepey, O., Aigbavboa, C., & Ansah, K. (2015). Barriers to successful implementation of sustainable construction in the Ghanaian construction industry. *Procedia Manufacturing*, *3*, 1682–1689.

Bon-Gang, H. (2018). *Chapter 5 - Obstacles and Solutions for Green Construction Projects* (H. B. T.-P. and I. of G. C. P. Bon-Gang (ed.); pp. 45–59). Butterworth-Heinemann. https://doi.org/https://doi.org/10.1016/B978-0-12-815483-0.00005-3

Central Statistical Organization. (2020). *Myamnar Year Book*. https://www.mmsis.gov.mm/sub_menu/statistics/fileDb.jsp?code_code=001

Doloi, H. (2008). Application of AHP in improving construction productivity from a management perspective. *Construction Management and Economics*, *26*(8), 841–854. https://doi.org/10.1080/01446190802244789

Garuti, C., & Salomon, V. A. P. (2012). Compatibility Indices Between Priority Vectors. *International Journal of the Analytic Hierarchy Process*, *4*(2). https://doi.org/10.13033/ijahp.v4i2.130

GoogleForm. (2022). *Online interview for a master thesis*. https://forms.gle/cQSiLoenjDx5yTZNA

GoogleSheet. (2022). *Sustainable construction score for interviewed professionals*. https://docs.google.com/spreadsheets/d/1cgBsfLaVoJcUgFbgHi6H4GQ1TsliuAcZ6whTkcCfVBY/edit?usp=sharing

Gunduz, M., & Almuajebh, M. (2020). Critical Success Factors for Sustainable Construction Project Management. *Sustainability*, *12*(5). https://doi.org/10.3390/su12051990

Hill, R. C., & Bowen, P. A. (1997). Sustainable construction: principles and a framework for attainment. *Construction Management & Economics*, *15*(3), 223–239.

HM Government. (2010). *Low Carbon Construction*. Innovation & Growth Team, Final Report. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31773/10-1266-low-carbon-construction-IGT-final-report.pdf

Japan International Cooperation Agency. (2013). *A Strategic Urban Development Plan of Greater Yangon*. https://openjicareport.jica.go.jp/pdf/12122511.pdf

Khaing, T. T. (2015). Urbanization: the structures of sustainable urban landscape of

Myanmar. *International Conference on Burma/Myanmar Studies, Chiang Mai University*, 24–25.

Lwin, M., & Panuwatwanich, K. (2020). Current Situation and Development of Green Building Rating System in Myanmar. *MATEC Web of Conferences*, *312*, 01003. https://doi.org/10.1051/matecconf/202031201003

Lynn, K. S. (2012). *Construction in Myanmar*. https://www.ipsos.com/sites/default/files/ct/publication/documents/2017-09/Research-Note-Construction-in-Myanmar.pdf

Mya, L. L. A. (2016). *Improving solid waste management in urban Myanmar – A study from Yangon, Summary of EEPSEA Research Report No. 2016-SRG7*.

Ortiz, O., Castells, F., & Sonnemann, G. (2009). Sustainability in the construction industry: A review of recent developments based on LCA. *Construction and Building Materials*, *23*(1), 28–39.

Saaty, T. L. (1980). *The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation*. MacGraw-Hill International Book Company.

Saaty, T. L. (1986). Axiomatic foundation of the analytic hierarchy process. *Management Science*, *32*(7), 841–855.

Saaty, T. L. (1990). An Exposition of the AHP in Reply to the Paper "Remarks on the Analytic Hierarchy Process." *Management Science*, *36*(3), 259–268. https://doi.org/10.1287/mnsc.36.3.259

Salgado, E. G., Salomon, V. A. P., & Mello, C. H. P. (2012). Analytic hierarchy prioritisation of new product development activities for electronics manufacturing. *International Journal of Production Research*, *50*(17), 4860–4866. https://doi.org/10.1080/00207543.2012.657972

Sfakianaki, E. (2019). Critical success factors for sustainable construction: a literature review. *Management of Environmental Quality: An International Journal*, *30*(1), 176–196. https://doi.org/10.1108/MEQ-02-2018-0043

Singh, R. P., & Nachtnebel, H. P. (2016). Analytical hierarchy process (AHP) application for reinforcement of hydropower strategy in Nepal. *Renewable and Sustainable Energy Reviews*, *55*, 43–58.

Sun, T., & Watanabe, W. C. (2017). The study of critical success factors of cross-border e-commerce freight forwarder from China to Thailand. *2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, 1848–1852.

Yangon City Development Committee. (2022). *YANGON BUILDING PERMIT*

*SYSTEM (YBPS): General Indicators*. https://ybps.ycdc.gov.mm/index.php/generalindicator/generalindicator

Zay, Y. L. (2015). *Underground water demand could weaken buildings*. The Myanmar Times. https://www.mmtimes.com/business/16248-underground-water-demand-could-weaken-buildings.html.

Zou, S., & Soratana, K. (2017). Investigation of Challenges in Implementing Sustainable Supply Chain Management for the Construction Industry in Thailand by an Interpretive Structural Model Approach. *World Academy of Science, Engineering and Technology Conference. Eissn*, *1307-6892*, *1438-1445*.

Zuraidi, S. N. F., Rahman, M. A. A., & Akasah, Z. A. (2018). A study of using AHP method to evaluate the criteria and attribute of defects in heritage building. *E3S Web of Conferences*, *65*, 1002.

# APPENDICES

# APPENDIX A

## Interview Questions for a Master Thesis (online and offline)

Dear Sir or Madam,

I am Sai Kyen Wann studying a master course in School of Logistics and Digital Supply Chain, Naresuan University, Thailand. I am conducting a thesis on sustainable construction titled "Influential factors on sustainable construction industry in Myanmar: A case study of private residential sector in Yangon" and beneficial group is targeted at experts, professionals or managers at key decision-making levels in construction.

Your kind cooperation and help are highly appreciated.

Best regards,

Sai Kyen Wann

Email: saikyenwa59@nu.ac.th

Fb: https://www.facebook.com/qr?id=100000836171631

**1. Interviewee's information**

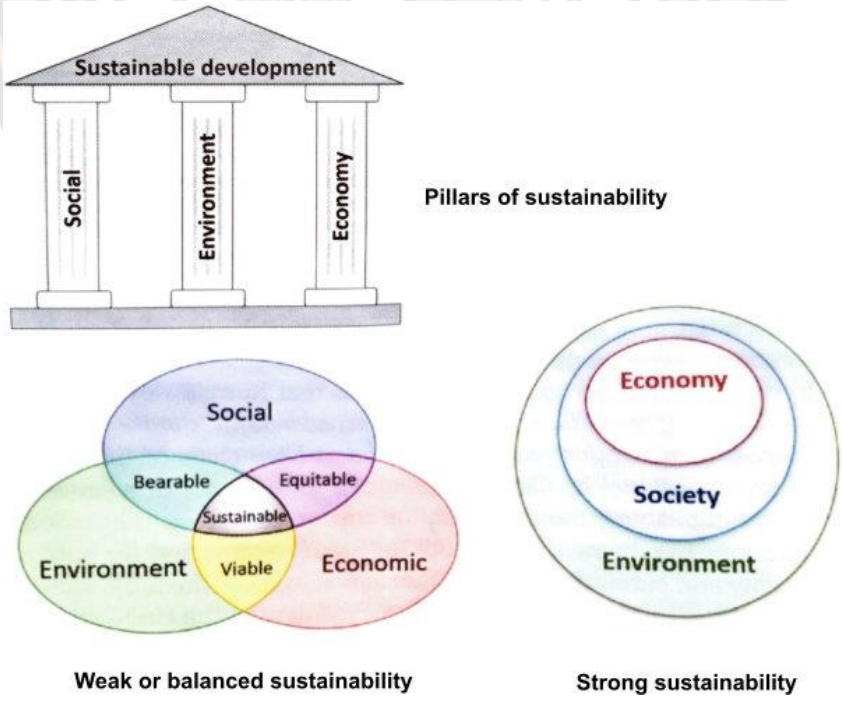
- Company name:
- Optional. It can be your department name in government service.
- Number of employees:
- Company role: building designer/developer/contractor/material supplier/academia/city development committee/Other (specify):
- Position:
- Work experience: under 5 years/6 to 10 years/11 to 15 years/16 to 20 years/more than 20 years
- Number of sustainable projects you have participated in:

**2. Construction impacts, sustainability concept and benefits of its implementation**

**2.1 Construction impacts:** Construction is one of the most significant industries in the world and accounts for 13% of world GDP. It has high impact not only on economy but also environment and society.

- Energy use ➢ Building activities take 20% of world energy usage (residential & commercial only) mainly during operation.
- Air quality and atmosphere ➢ Concurrently air pollution causes 18,000 people die each day worldwide and estimated one-third of greenhouse gas emission is from buildings.
- Water use ➢ Buildings are one of the largest water consumers.
- Indoor environmental impacts ➢ Indoor environment is very important for human health, comfort and productivity. Indoor pollutant levels are often higher than outside (typically 2.5 times and occasionally 100 times) as pollutant can come from building materials and components including other household things.
- Material and waste impact ➢ In total, buildings consume 75% of concrete, 38% of wood, 21% of steel, etc. Waste from Construction and demolition is twice the municipal waste yearly.
- Land use impact ➢ Construction activities transform valuable farmland and forests into physical assets. It negatively affects biodiversity, crop production, photosynthesis, air purification and other ecosystem services.

**2.2 Sustainable concept:**




3 pillars of sustainability: interrelated balance of economy, social and environmental

**2.3 Sustainability definition** ➢ to enable all people to meet their basic needs and improve their quality of life, while ensuring that the natural systems, resources and diversity upon which they depend are maintained and enhanced, for both their benefit and that of future generations

**2.4 Sustainable or green construction definition** ➢ the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life cycle from siting to design, construction, operation, maintenance, renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort

**2.5 Benefits of sustainable construction**:

Environmental benefits ➢ Enhance and protect biodiversity and ecosystems • Improve air and water quality • Reduce waste streams • Conserve and restore natural resources • Reduce global warming

Economic benefits ➢ Reduce operating and maintenance costs • Create, expand and shape markets for green product and services • Improve occupant productivity • Minimize occupant absenteeism • Optimize lifecycle economic performance • Improve the image of building • gain reputation • Reduce the civil infrastructure cost

Social benefits ➢ Enhance occupant comfort and health • Heighten aesthetic qualities opportunities • Create new and enhanced employment and business opportunities • Improve overall quality of life • Minimize strain on local infrastructure

**3. Interview questions and discussion (focused on residential construction)**

Please select "Yes" if the factor is critically important or "No" if the factor is less or not important. Also give more information about each factor (if any). Click "Submit" at the end of form.

3.1 "**Design**" is critically important for sustainable construction in the following or other ways. How do you think?

(Sustainable building design begins with the proper site selection, including the existing building’s rehabilitation. The location, orientation, and landscaping of a building all affect local ecosystems, transportation methods, and energy use. Good design optimizes energy use. It can help protect and reserve water providing to use water efficiently, and reuse or recycle water for on-site use. Good design optimizes building space and material use. It enhances indoor environmental quality.

Specifications of proper materials and systems also optimize operation and maintenance.)

Answer: Yes/No. Discuss more (if any):

3.2 "**Cost premium of green building project**" is critically important for sustainable construction in the following or other ways. How do you think? (Yes = critically important; No = averagely or less important)

(Normally cost premium of green building project is high. However green building gains competitive advantage in the market while seeking to offset the higher cost with the economic incentive.)

Answer: Yes/No. Discuss more (if any):

3.3 "**3Rs system (reduce/reuse/recycle) at the level of enterprise strategy**" is critically important for sustainable construction in the following or other ways. How do you think?

(Many materials are reusable. With today sustainable technologies, recycled materials can be used in real case. Those benefit economically and environmentally.)

Answer: Yes/No. Discuss more (if any):

3.4 "**Superlative communication and interest among project team members**" is critically important for sustainable construction in the following or other ways. How do you think?

(Sustainable building projects need superlative communication because their design features are unique and detailed to integrate with every aspect of the building.)

Answer: Yes/No. Discuss more (if any):

3.5 "**Expertise and knowledge in green building**" is critically important for sustainable construction in the following or other ways. How do you think?

(Experts, experienced professionals and consultancy services are essentially needed in green building.)

Answer: Yes/No. Discuss more (if any):

3.6 "**Managers and professionals strictly follow green construction practices framework**" is critically important for sustainable construction in the following or other ways. How do you think?

(They can manage and push the project to achieve sustainable goals.)

Answer: Yes/No. Discuss more (if any):

3.7 "**Interest from client and market demand**" is critically important for sustainable construction in the following or other ways. How do you think?

(Society of high sustainable awareness is willing to pay for premium sustainable services.)

Answer: Yes/No. Discuss more (if any):

3.8 "**Overcoming resistance to change from conventional to green practices by company's employees**" is critically important for sustainable construction in the following or other ways. How do you think?

(Unless traditional perception of how to build a building is still dominant, what are the obstacles?)

Answer: Yes/No. Discuss more (if any):

3.9 "**Government support (incentives) for sustainable construction**" is critically important for sustainable construction in the following or other ways. How do you think?

(Government support can be scheme to promote sustainability such as subsidy, lower tax, low interest rate loan, sustainable award, green mark certificate, etc.)

Answer: Yes/No. Discuss more (if any):

3.10 "**Credible research on the benefits of green buildings**" is critically important for sustainable construction in the following or other ways. How do you think?

(Improve research and development in products and technologies for green buildings.)

Answer: Yes/No. Discuss more (if any):

3.11 "**Political stability**" is critically important for sustainable construction in the following or other ways. How do you think?

(This is a high-impact external factor directly dealing with economic performance)

Answer: Yes/No. Discuss more (if any):

3.12 "**Policies and regulations**" is critically important for sustainable construction in the following or other ways. How do you think?

(Government takes an important role here. Policy includes technical supports, promoting innovative sustainable construction techniques and creating training opportunities for general sustainability, sustainable construction principles, rating system requirements and technology. Pilot projects are also promoted. Regulations come with enforcement, measurement system, penalty and incentive package together. As a result, the right polices and regulations will facilitate sustainable implementation.)

Answer: Yes/No. Discuss more (if any):

3.13 "**Resource management (water; energy)**" is critically important for sustainable construction in the following or other ways. How do you think?

(Among life cycle phases of residential building, major energy is consumed during building operation (43% of all energy delivered). A study shows that a managed building can reduce 32.4% of energy use and 55.4% water consumption rates (by improving thermal insulation of the external walls and roofs; more efficient glazing; fitting external shading devices; and fitting energy-efficient fluorescent lighting. Suggested water conservation management includes the use of low-flow taps in kitchens and bathrooms; low-flow showerheads; efficient washing machines; and the installation of a grey water system))

Answer: Yes/No. Discuss more (if any):

3.14 "**Embrace of sustainable technologies**" is critically important for sustainable construction in the following or other ways. How do you think?

(Environment-friendly materials, renewable energy and sustainable techniques reduce the adverse impacts on surrounding communities, and improve the utilization efficiency of natural resources in construction projects. Some good examples of sustainable technologies are prefabricated engineered solid wood panels, many novel materials composed from recycled construction and demolition wastes and the applications of grey water re-cycling systems in the building level.)

Answer: Yes/No. Discuss more (if any):

3.15 "**Application of lean construction**" is critically important for sustainable construction in the following or other ways. How do you think?

(Lean concept is to eliminate wastes produced in a construction process. They are not only physical wastes but including non-value-adding activities and waiting time. It prevents material losses and save costs. So, it improves operational efficiency and reduces wastes at the same time.)

Answer: Yes/No. Discuss more (if any):

3.16 "**Environment management (noise control; the improvement of surrounding environment)**" is critically important for sustainable construction in the following or other ways. How do you think?

(It is directly impact on living environment of the society widely)

Answer: Yes/No. Discuss more (if any):

3.17 "**Promoting a sustainable mind-set and culture across organization**" is critically important for sustainable construction in the following or other ways. How do you think?

(Since mind-set and culture is the common brief and value of an organization, it will influence the key stakeholders' behaviors and decision-making. Positive culture can lead to adopt sustainable practices and share a common understanding of the definition, principles and concepts of sustainable construction.)

Answer: Yes/No. Discuss more (if any):

3.18 "**Developing sustainable awareness of clients**" is critically important for sustainable construction in the following or other ways. How do you think?

(The development of the awareness of home buyers about the potential of sustainable or green building is a high-impact driver. Research studies or evidence to convince that green building helps increase productivity and health of occupant. Besides good quality delivery, easily understandable information about the potential of sustainable building is also important. In order to enable this kind of work, relevant programs and projects should be developed, sponsored and offered by authorities.)

Answer: Yes/No. Discuss more (if any):

3.19 "**Cost of green building practice implementation**" is critically important for sustainable construction in the following or other ways. How do you think?

(Green projects are always more costly than conventional ones in economic aspect.)

Answer: Yes/No. Discuss more (if any):

3.20 "**Incentive mechanism for project team members**" is critically important for sustainable construction in the following or other ways. How do you think?

(Incentive mechanism (e.g., bonus, certificate of appreciation or other rewards) is designated for project team members who work hard, and devote their time, attention and efforts to adopt the sustainable construction practices towards sustainable goal.)

Answer: Yes/No. Discuss more (if any):

**Additional information:**

Please describe your additional information or other critical factors (if any):

- End of the interview -

Thank you.

Please click [Submit] or the following green button to finish this interview (online only).

# APPENDIX B

## Questionnaire for Analytic Hierarchy Process (online GoogleSheet and offline MSExcel)

---

Dear Sir or Madam,

According to the interviewed professionals' opinions, 8 most critical factors are obtained to prioritize for the thesis titled “Influential factors on sustainable construction industry in Myanmar: A case study of private residential sector in Yangon”
Please judge and score each pairwise comparison of the factors by AHP Saaty's Scale as follows: -

| Your Opinion | Score |
|---|---|
| Extremely preferred | 9 |
| Very strongly preferred | 7 |
| Strongly preferred | 5 |
| Moderately preferred | 3 |
| Equally preferred | 1 |
| The Intermediate values of 2, 4, 6 and 8 are additional levels of discrimination. | |

**Example:**
If factor A is strongly preferred to factor B,

| | | | | |
|---|---|---|---|---|
| factor A | **5** | | | factor B |

If factor C is moderately preferred to factor A,

| | | | | |
|---|---|---|---|---|
| factor A | | | **3** | factor C |

If factor B is equally preferred with factor C,

| | | | | |
|---|---|---|---|---|
| factor B | | **1** | | factor C |

Please select your most consistent score in the following each pairwise comparison in Table 1, 2, 3, and 4

**Table 1. Score for Criteria:**

| Criteria | Score | | | Criteria |
|---|---|---|---|---|
| Economic benefits | | | | Social benefits |
| Economic benefits | | | | Environmental benefits |
| Social benefits | | | | Environmental benefits |
| Consistency check (It should be between 0 to 0.10 or adjust your scores) | | | | - |

**Table 2. In favour of Economic Benefits:**

| Factor | Score | | | Factor |
|---|---|---|---|---|
| Design | | | | Expertise and knowledge in green building |
| Design | | | | Resource management (water; energy) |
| Design | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Design | | | | Credible research on the benefits of green buildings |
| Design | | | | Political stability |
| Design | | | | Application of lean construction |
| Design | | | | Developing sustainable awareness of clients |
| Expertise and knowledge in green building | | | | Resource management (water; energy) |
| Expertise and knowledge in green building | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Expertise and knowledge in green building | | | | Credible research on the benefits of green buildings |

| | | | | |
|---|---|---|---|---|
| Expertise and knowledge in green building | | | | Political stability |
| Expertise and knowledge in green building | | | | Application of lean construction |
| Expertise and knowledge in green building | | | | Developing sustainable awareness of clients |
| Resource management (water; energy) | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Resource management (water; energy) | | | | Credible research on the benefits of green buildings |
| Resource management (water; energy) | | | | Political stability |
| Resource management (water; energy) | | | | Application of lean construction |
| Resource management (water; energy) | | | | Developing sustainable awareness of clients |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Credible research on the benefits of green buildings |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Political stability |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Application of lean construction |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Developing sustainable awareness of clients |
| Credible research on the benefits of green buildings | | | | Political stability |
| Credible research on the benefits of green buildings | | | | Application of lean construction |
| Credible research on the benefits of green buildings | | | | Developing sustainable awareness of clients |

| | | | | |
|---|---|---|---|---|
| Political stability | | | | Application of lean construction |
| Political stability | | | | Developing sustainable awareness of clients |
| Application of lean construction | | | | Developing sustainable awareness of clients |
| Consistency check (It should be between 0 to 0.10 or adjust your scores) | | | | - |

**Table 3. In favour of Social Benifits:**

| Factor | Score | | | Factor |
|---|---|---|---|---|
| Design | | | | Expertise and knowledge in green building |
| Design | | | | Resource management (water; energy) |
| Design | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Design | | | | Credible research on the benefits of green buildings |
| Design | | | | Political stability |
| Design | | | | Application of lean construction |
| Design | | | | Developing sustainable awareness of clients |
| Expertise and knowledge in green building | | | | Resource management (water; energy) |
| Expertise and knowledge in green building | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Expertise and knowledge in green building | | | | Credible research on the benefits of green buildings |
| Expertise and knowledge in green building | | | | Political stability |
| Expertise and knowledge in green building | | | | Application of lean construction |

| | | | | |
|---|---|---|---|---|
| Expertise and knowledge in green building | | | | Developing sustainable awareness of clients |
| Resource management (water; energy) | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Resource management (water; energy) | | | | Credible research on the benefits of green buildings |
| Resource management (water; energy) | | | | Political stability |
| Resource management (water; energy) | | | | Application of lean construction |
| Resource management (water; energy) | | | | Developing sustainable awareness of clients |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Credible research on the benefits of green buildings |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Political stability |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Application of lean construction |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Developing sustainable awareness of clients |
| Credible research on the benefits of green buildings | | | | Political stability |
| Credible research on the benefits of green buildings | | | | Application of lean construction |
| Credible research on the benefits of green buildings | | | | Developing sustainable awareness of clients |
| Political stability | | | | Application of lean construction |
| Political stability | | | | Developing sustainable awareness of clients |

| | | | | |
|---|---|---|---|---|
| Application of lean construction | | | | Developing sustainable awareness of clients |
| Consistency check<br>(It should be between 0 to 0.10 or adjust your score) | | | | - |

**Table 4. In favour of Environmental Benefits:**

| Factor | Score | | | Factor |
|---|---|---|---|---|
| Design | | | | Expertise and knowledge in green building |
| Design | | | | Resource management (water; energy) |
| Design | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Design | | | | Credible research on the benefits of green buildings |
| Design | | | | Political stability |
| Design | | | | Application of lean construction |
| Design | | | | Developing sustainable awareness of clients |
| Expertise and knowledge in green building | | | | Resource management (water; energy) |
| Expertise and knowledge in green building | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Expertise and knowledge in green building | | | | Credible research on the benefits of green buildings |
| Expertise and knowledge in green building | | | | Political stability |
| Expertise and knowledge in green building | | | | Application of lean construction |
| Expertise and knowledge in green building | | | | Developing sustainable awareness of clients |

| | | | | |
|---|---|---|---|---|
| Resource management (water; energy) | | | | Overcoming resistance to change from conventional to green practices by company's employees |
| Resource management (water; energy) | | | | Credible research on the benefits of green buildings |
| Resource management (water; energy) | | | | Political stability |
| Resource management (water; energy) | | | | Application of lean construction |
| Resource management (water; energy) | | | | Developing sustainable awareness of clients |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Credible research on the benefits of green buildings |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Political stability |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Application of lean construction |
| Overcoming resistance to change from conventional to green practices by company's employees | | | | Developing sustainable awareness of clients |
| Credible research on the benefits of green buildings | | | | Political stability |
| Credible research on the benefits of green buildings | | | | Application of lean construction |
| Credible research on the benefits of green buildings | | | | Developing sustainable awareness of clients |
| Political stability | | | | Application of lean construction |
| Political stability | | | | Developing sustainable awareness of clients |
| Application of lean construction | | | | Developing sustainable awareness of clients |

| | |
|---|---|
| Consistency check<br>(It should be between 0 to 0.10 or adjust your scores) | - |

- - - - - - End - - - - - -

Thank you.

# APPENDIX C

## AHP Data Analysis for Each of Respondent 1 to Respondent 30

**Table 13 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 1**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 5 | | | | |
| Social | 1/3 | 1 | 3 | | | | |
| Environmental | 1/5 | 1/3 | 1 | | | | |
| Weight | 0.633 | 0.260 | 0.106 | | | | |
| Consistency | λmax | 3.039 | CI | 0.019 | RI | 0.58 | CR | 0.03 |

**Table 14 Pairwise comparison matrix: Economic aspect of Respondent 1**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 5 | 3 | 1 | 1 | 1/3 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1/5 |
| Factor3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1/7 | 1/3 | 1/3 |
| Factor4 | 1/5 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 1 | 3 | 3 | 1 | 1/7 | 1 | 1/3 |
| Factor6 | 1 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1 | 1 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor8 | 3 | 5 | 3 | 3 | 3 | 1/7 | 3 | 1 |
| Weight | 0.160 | 0.048 | 0.035 | 0.052 | 0.071 | 0.381 | 0.071 | 0.182 |
| Consistency | λmax | 8.937 | CI | 0.134 | RI | 1.41 | CR | 0.09 |

**Table 15 Pairwise comparison matrix: Social aspect of Respondent 1**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 3 | 3 | 1/5 | 1 | 1/3 |
| Factor2 | 1 | 1 | 3 | 1 | 1/3 | 1/7 | 3 | 1/3 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1/3 | 1/7 | 1/3 | 1/5 |
| Factor4 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 3 | 3 | 3 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 5 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1 | 1/3 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 3 | 3 | 5 | 3 | 3 | 1/7 | 3 | 1 |
| Weight | 0.098 | 0.073 | 0.029 | 0.053 | 0.099 | 0.433 | 0.055 | 0.161 |
| Consistency | λmax | 8.911 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 16 Pairwise comparison matrix: Environmental aspect of Respondent 1**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 3 | 3 | 1 | 3 | 3 |
| Factor2 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 3 | 1/3 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1/3 | 1/7 | 1 | 1/3 |
| Factor4 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 3 | 3 | 3 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 1 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1/3 | 1/3 | 1 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 1/3 | 3 | 3 | 3 | 3 | 1/7 | 3 | 1 |
| Weight | 0.201 | 0.069 | 0.038 | 0.057 | 0.100 | 0.370 | 0.042 | 0.123 |
| Consistency | λmax | 8.794 | CI | 0.113 | RI | 1.41 | CR | 0.08 |

**Table 17 Weight of the influential factors of Respondent 1**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.633 | 0.260 | 0.106 | |
| Factor1 | 0.160 | 0.098 | 0.201 | 0.148 |
| Factor2 | 0.048 | 0.073 | 0.069 | 0.056 |
| Factor3 | 0.035 | 0.029 | 0.038 | 0.034 |
| Factor4 | 0.052 | 0.053 | 0.057 | 0.053 |
| Factor5 | 0.071 | 0.099 | 0.100 | 0.082 |
| Factor6 | 0.381 | 0.433 | 0.370 | 0.393 |
| Factor7 | 0.071 | 0.055 | 0.042 | 0.064 |
| Factor8 | 0.182 | 0.161 | 0.123 | 0.170 |

**Table 18 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 2**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 5 | 5 | | | | | |
| Social | 1/5 | 1 | 1 | | | | | |
| Environmental | 1/5 | 1 | 1 | | | | | |
| Weight | 0.714 | 0.143 | 0.143 | | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 19 Pairwise comparison matrix: Economic aspect of Respondent 2**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1/3 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor4 | 1 | 1/5 | 1 | 1 | 1 | 1 | 1/5 | 1 |
| Factor5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1/3 |
| Factor7 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 3 | 3 | 1 | 1 | 3 | 1 | 1 |
| Weight | 0.132 | 0.132 | 0.080 | 0.090 | 0.115 | 0.119 | 0.146 | 0.186 |
| Consistency | λmax | 8.912 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 20 Pairwise comparison matrix: Social aspect of Respondent 2**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1 |
| Factor3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1/3 | 1/3 | 1/5 |
| Factor4 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 3 | 3 | 3 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 3 | 5 | 3 | 7 | 7 | 1 | 7 | 3 |
| Factor7 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor8 | 1 | 1 | 5 | 3 | 3 | 1/3 | 1 | 1 |
| Weight | 0.156 | 0.062 | 0.046 | 0.060 | 0.108 | 0.360 | 0.070 | 0.138 |
| Consistency | λmax | 8.903 | CI | 0.129 | RI | 1.41 | CR | 0.09 |

**Table 21 Pairwise comparison matrix: Environmental aspect of Respondent 2**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/7 | 1/5 | 1/5 | 1 | 1/3 | 1 | 1/3 |
| Factor2 | 7 | 1 | 1 | 1 | 3 | 1 | 3 | 5 |
| Factor3 | 5 | 1 | 1 | 1 | 1 | 3 | 1 | 3 |
| Factor4 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 1 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor6 | 3 | 1 | 1/3 | 1 | 3 | 1 | 3 | 1 |
| Factor7 | 1 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 3 |
| Factor8 | 3 | 1/5 | 1/3 | 1 | 1 | 1 | 1/3 | 1 |
| Weight | 0.045 | 0.218 | 0.180 | 0.133 | 0.087 | 0.152 | 0.103 | 0.082 |
| Consistency | λmax | 8.931 | CI | 0.133 | RI | 1.41 | CR | 0.09 |

**Table 22 Weight of the influential factors of Respondent 2**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.714 | 0.143 | 0.143 | |
| Factor1 | 0.132 | 0.156 | 0.045 | 0.123 |
| Factor2 | 0.132 | 0.062 | 0.218 | 0.134 |
| Factor3 | 0.080 | 0.046 | 0.180 | 0.090 |
| Factor4 | 0.090 | 0.060 | 0.133 | 0.092 |
| Factor5 | 0.115 | 0.108 | 0.087 | 0.110 |
| Factor6 | 0.119 | 0.360 | 0.152 | 0.158 |
| Factor7 | 0.146 | 0.070 | 0.103 | 0.129 |
| Factor8 | 0.186 | 0.138 | 0.082 | 0.165 |

**Table 23 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 3**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 3 | | | | | |
| Social | 1/3 | 1 | 1 | | | | | |
| Environmental | 1/3 | 1 | 1 | | | | | |
| Weight | 0.600 | 0.200 | 0.200 | | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 24 Pairwise comparison matrix: Economic aspect of Respondent 3**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1/3 | 1 | 1 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 3 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor8 | 1 | 1 | 3 | 1 | 1/3 | 1 | 1 | 1 |
| Weight | 0.128 | 0.107 | 0.107 | 0.116 | 0.169 | 0.104 | 0.141 | 0.128 |
| Consistency | λmax | 8.644 | CI | 0.092 | RI | 1.41 | CR | 0.07 |

**Table 25 Pairwise comparison matrix: Social aspect of Respondent 3**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 5 | 3 | 1 | 3 | 3 | 3 |
| Factor2 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1/7 | 3 | 1/3 |
| Factor3 | 1/5 | 1 | 1 | 1/3 | 1/5 | 1/7 | 1 | 1/3 |
| Factor4 | 1/3 | 3 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor5 | 1 | 3 | 5 | 1 | 1 | 1/5 | 3 | 1 |
| Factor6 | 1/3 | 7 | 7 | 7 | 5 | 1 | 7 | 5 |
| Factor7 | 1/3 | 1/3 | 1 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 1/3 | 3 | 3 | 3 | 1 | 1/5 | 3 | 1 |
| Weight | 0.235 | 0.052 | 0.035 | 0.076 | 0.127 | 0.321 | 0.042 | 0.111 |
| Consistency | λmax | 8.977 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 26 Pairwise comparison matrix: Environmental aspect of Respondent 3**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 3 | 3 | 1 | 1 | 3 |
| Factor2 | 1 | 1 | 5 | 1 | 1 | 1/3 | 1 | 1 |
| Factor3 | 1/3 | 1/5 | 1 | 1/3 | 1 | 1/3 | 1 | 1/3 |
| Factor4 | 1/3 | 1 | 3 | 1 | 1/3 | 1 | 1 | 1 |
| Factor5 | 1/3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 |
| Factor8 | 1/3 | 1 | 3 | 1 | 1 | 1 | 3 | 1 |
| Weight | 0.204 | 0.126 | 0.057 | 0.101 | 0.120 | 0.153 | 0.104 | 0.135 |
| Consistency | λmax | 8.871 | CI | 0.124 | RI | 1.41 | CR | 0.09 |

**Table 27 Weight of the influential factors of Respondent 3**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.600 | 0.200 | 0.200 | |
| Factor1 | 0.128 | 0.235 | 0.204 | 0.165 |
| Factor2 | 0.107 | 0.052 | 0.126 | 0.100 |
| Factor3 | 0.107 | 0.035 | 0.057 | 0.083 |
| Factor4 | 0.116 | 0.076 | 0.101 | 0.105 |
| Factor5 | 0.169 | 0.127 | 0.120 | 0.151 |
| Factor6 | 0.104 | 0.321 | 0.153 | 0.157 |
| Factor7 | 0.141 | 0.042 | 0.104 | 0.114 |
| Factor8 | 0.128 | 0.111 | 0.135 | 0.126 |

**Table 28 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 4**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 1/2 | 1 | | | | | |
| Social | 2 | 1 | 1 | | | | | |
| Environmental | 1 | 1 | 1 | | | | | |
| Weight | 0.261 | 0.411 | 0.328 | | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 29 Pairwise comparison matrix: Economic aspect of Respondent 4**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 3 | 5 | 1/7 | 5 | 9 |
| Factor2 | 1/3 | 1 | 1/2 | 2 | 4 | 1/6 | 2 | 4 |
| Factor3 | 1/3 | 2 | 1 | 5 | 8 | 1/5 | 7 | 6 |
| Factor4 | 1/3 | 1/2 | 1/5 | 1 | 3 | 1/7 | 4 | 3 |
| Factor5 | 1/5 | 1/4 | 1/8 | 1/3 | 1 | 1/6 | 1/2 | 1 |
| Factor6 | 7 | 6 | 5 | 7 | 6 | 1 | 5 | 7 |
| Factor7 | 1/5 | 1/2 | 1/7 | 1/4 | 2 | 1/5 | 1 | 1 |
| Factor8 | 1/9 | 1/4 | 1/6 | 1/3 | 1 | 1/7 | 1 | 1 |
| Weight | 0.187 | 0.085 | 0.171 | 0.070 | 0.029 | 0.390 | 0.039 | 0.029 |
| Consistency | λmax | 8.974 | CI | 0.139 | RI | 1.41 | CR | 0.10 |

**Table 30 Pairwise comparison matrix: Social aspect of Respondent 4**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 5 | 5 | 1/3 | 1 | 1 |
| Factor2 | 1/3 | 1 | 3 | 3 | 1/3 | 1/5 | 1/3 | 1/3 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1/5 | 1/7 | 1/3 | 1/3 |
| Factor4 | 1/5 | 1/3 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1/5 | 3 | 5 | 3 | 1 | 1/5 | 1 | 1/3 |
| Factor6 | 3 | 5 | 7 | 7 | 5 | 1 | 3 | 3 |
| Factor7 | 1 | 3 | 3 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor8 | 1 | 3 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Weight | 0.163 | 0.064 | 0.033 | 0.052 | 0.097 | 0.333 | 0.098 | 0.160 |
| Consistency | λmax | 8.879 | CI | 0.126 | RI | 1.41 | CR | 0.09 |

**Table 31 Pairwise comparison matrix: Environmental aspect of Respondent 4**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1/3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1/3 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/5 | 1/3 | 1 | 1/7 |
| Factor5 | 1 | 5 | 3 | 5 | 1 | 5 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 3 | 1/5 | 1 | 1 | 1 |
| Factor7 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 7 | 1 | 1 | 1 | 1 |
| Weight | 0.099 | 0.079 | 0.082 | 0.070 | 0.238 | 0.105 | 0.176 | 0.150 |
| Consistency | λmax | 8.935 | CI | 0.134 | RI | 1.41 | CR | 0.09 |

**Table 32 Weight of the influential factors of Respondent 4**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.261 | 0.411 | 0.328 | |
| Factor1 | 0.187 | 0.163 | 0.099 | 0.148 |
| Factor2 | 0.085 | 0.064 | 0.079 | 0.074 |
| Factor3 | 0.171 | 0.033 | 0.082 | 0.085 |
| Factor4 | 0.070 | 0.052 | 0.070 | 0.063 |
| Factor5 | 0.029 | 0.097 | 0.238 | 0.126 |
| Factor6 | 0.390 | 0.333 | 0.105 | 0.273 |
| Factor7 | 0.039 | 0.098 | 0.176 | 0.108 |
| Factor8 | 0.029 | 0.160 | 0.150 | 0.123 |

**Table 33 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 5**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 2 | | | | |
| Social | 1 | 1 | 2 | | | | |
| Environmental | 1/2 | 1/2 | 1 | | | | |
| Weight | 0.400 | 0.400 | 0.200 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 34 Pairwise comparison matrix: Economic aspect of Respondent 5**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor2 | 1/3 | 1 | 1/3 | 1 | 1 | 1/3 | 1 | 1/5 |
| Factor3 | 1 | 3 | 1 | 1 | 5 | 5 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 1 | 1 | 1/5 | 1 | 1 | 1 | 1 | 1/5 |
| Factor6 | 1 | 3 | 1/5 | 1 | 1 | 1 | 1/3 | 1/7 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1/5 |
| Factor8 | 1 | 5 | 1 | 1 | 5 | 7 | 5 | 1 |
| Weight | 0.127 | 0.062 | 0.184 | 0.113 | 0.075 | 0.080 | 0.105 | 0.255 |
| Consistency | λmax | 8.980 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 35 Pairwise comparison matrix: Social aspect of Respondent 5**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1 |
| Factor5 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1/7 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 1 |
| Weight | 0.116 | 0.110 | 0.116 | 0.104 | 0.141 | 0.126 | 0.116 | 0.172 |
| Consistency | λmax | 8.781 | CI | 0.112 | RI | 1.41 | CR | 0.08 |

**Table 36 Pairwise comparison matrix: Environmental aspect of Respondent 5**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1/5 | 1/3 | 1 | 1/3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1/5 | 1 |
| Factor3 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1 | 1 |
| Factor4 | 5 | 1 | 3 | 1 | 1 | 3 | 1 | 1 |
| Factor5 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 5 |
| Factor6 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1 | 1 |
| Factor7 | 3 | 5 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 | 1 |
| Weight | 0.070 | 0.084 | 0.100 | 0.195 | 0.189 | 0.100 | 0.165 | 0.097 |
| Consistency | λmax | 8.776 | CI | 0.111 | RI | 1.41 | CR | 0.08 |

**Table 37 Weight of the influential factors of Respondent 5**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.400 | 0.400 | 0.200 | |
| Factor1 | 0.127 | 0.116 | 0.070 | 0.111 |
| Factor2 | 0.062 | 0.110 | 0.084 | 0.085 |
| Factor3 | 0.184 | 0.116 | 0.100 | 0.140 |
| Factor4 | 0.113 | 0.104 | 0.195 | 0.126 |
| Factor5 | 0.075 | 0.141 | 0.189 | 0.124 |
| Factor6 | 0.080 | 0.126 | 0.100 | 0.102 |
| Factor7 | 0.105 | 0.116 | 0.165 | 0.121 |
| Factor8 | 0.255 | 0.172 | 0.097 | 0.190 |

**Table 38 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 6**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 2 | 2 | | | | | |
| Social | 1/2 | 1 | 2 | | | | | |
| Environmental | 1/2 | 1/2 | 1 | | | | | |
| Weight | 0.490 | 0.312 | 0.198 | | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 39 Pairwise comparison matrix: Economic aspect of Respondent 6**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1/3 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor5 | 1 | 1 | 1/3 | 3 | 1 | 1/7 | 1/3 | 1/3 |
| Factor6 | 7 | 7 | 3 | 7 | 7 | 1 | 5 | 3 |
| Factor7 | 1 | 1/3 | 1 | 1 | 3 | 1/5 | 1 | 1/3 |
| Factor8 | 1 | 1 | 1 | 1 | 3 | 1/3 | 3 | 1 |
| Weight | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 |
| Consistency | λmax | 8.943 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 40 Pairwise comparison matrix: Social aspect of Respondent 6**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 3 | 1/3 | 1/7 | 1 | 1/2 |
| Factor2 | 1 | 1 | 1 | 4 | 2 | 1/7 | 3 | 1 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1/2 | 1/7 | 1/3 | 1/3 |
| Factor4 | 1/3 | 1/4 | 1 | 1 | 1/3 | 1/7 | 1/2 | 1/2 |
| Factor5 | 3 | 1/2 | 2 | 3 | 1 | 1/7 | 1/2 | 1/2 |
| Factor6 | 7 | 7 | 7 | 7 | 7 | 1 | 6 | 5 |
| Factor7 | 1 | 1/3 | 3 | 2 | 2 | 1/6 | 1 | 1/5 |
| Factor8 | 2 | 1 | 3 | 2 | 2 | 1/5 | 5 | 1 |
| Weight | 0.078 | 0.107 | 0.044 | 0.038 | 0.085 | 0.438 | 0.077 | 0.133 |
| Consistency | λmax | 8.900 | CI | 0.129 | RI | 1.41 | CR | 0.09 |

**Table 41 Pairwise comparison matrix: Environmental aspect of Respondent 6**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 1/3 | 1 | 3 | 1/7 | 3 | 1 |
| Factor2 | 3 | 1 | 1/3 | 3 | 1 | 1/3 | 1 | 3 |
| Factor3 | 3 | 3 | 1 | 3 | 1 | 1 | 3 | 3 |
| Factor4 | 1 | 1/3 | 1/3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 |
| Factor6 | 7 | 3 | 1 | 7 | 5 | 1 | 7 | 7 |
| Factor7 | 1/3 | 1 | 1/3 | 1 | 1 | 1/7 | 1 | 1 |
| Factor8 | 1 | 1/3 | 1/3 | 3 | 1 | 1/7 | 1 | 1 |
| Weight | 0.087 | 0.114 | 0.197 | 0.051 | 0.079 | 0.345 | 0.059 | 0.068 |
| Consistency | λmax | 8.868 | CI | 0.124 | RI | 1.41 | CR | 0.09 |

**Table 42 Weight of the influential factors of Respondent 6**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.490 | 0.312 | 0.198 | |
| Factor1 | 0.091 | 0.078 | 0.087 | 0.086 |
| Factor2 | 0.085 | 0.107 | 0.114 | 0.097 |
| Factor3 | 0.098 | 0.044 | 0.197 | 0.101 |
| Factor4 | 0.071 | 0.038 | 0.051 | 0.057 |
| Factor5 | 0.067 | 0.085 | 0.079 | 0.075 |
| Factor6 | 0.398 | 0.438 | 0.345 | 0.400 |
| Factor7 | 0.076 | 0.077 | 0.059 | 0.073 |
| Factor8 | 0.114 | 0.133 | 0.068 | 0.111 |

**Table 43 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 7**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 1 | | | | | |
| Social | 1 | 1 | 1 | | | | | |
| Environmental | 1 | 1 | 1 | | | | | |
| Weight | 0.333 | 0.333 | 0.333 | | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 44 Pairwise comparison matrix: Economic aspect of Respondent 7**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 1 | 1/3 | 1 | 1 | 1 | 1/3 |
| Factor2 | 3 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 |
| Factor3 | 1 | 1 | 1 | 1/3 | 1/3 | 1 | 1 | 1 |
| Factor4 | 3 | 1 | 3 | 1 | 1/3 | 1 | 1/3 | 1 |
| Factor5 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 3 | 1 | 3 | 1 | 1 | 1 | 1 |
| Factor8 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.087 | 0.120 | 0.094 | 0.128 | 0.159 | 0.115 | 0.165 | 0.132 |
| Consistency | λmax | 8.842 | CI | 0.120 | RI | 1.41 | CR | 0.09 |

**Table 45 Pairwise comparison matrix: Social aspect of Respondent 7**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1 | 1/3 |
| Factor2 | 3 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1/3 |
| Factor3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor4 | 3 | 1 | 1 | 1 | 1/3 | 1 | 1/2 | 1 |
| Factor5 | 3 | 3 | 1 | 3 | 1 | 1/3 | 1 | 1/3 |
| Factor6 | 3 | 1 | 1 | 1 | 3 | 1 | 1 | 1/3 |
| Factor7 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Factor8 | 3 | 3 | 1 | 1 | 3 | 3 | 1 | 1 |
| Weight | 0.064 | 0.103 | 0.113 | 0.110 | 0.148 | 0.136 | 0.125 | 0.203 |
| Consistency | λmax | 8.936 | CI | 0.134 | RI | 1.41 | CR | 0.09 |

**Table 46 Pairwise comparison matrix: Environmental aspect of Respondent 7**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 1/3 | 1/3 | 1/3 | 1 | 1 | 1/3 |
| Factor2 | 1/5 | 1 | 1/3 | 1/3 | 1 | 1 | 1 | 1 |
| Factor3 | 3 | 3 | 1 | 1/3 | 1/3 | 1 | 1 | 1 |
| Factor4 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.101 | 0.087 | 0.121 | 0.171 | 0.156 | 0.116 | 0.116 | 0.132 |
| Consistency | λmax | 9.063 | CI | 0.152 | RI | 1.41 | CR | 0.11 |

**Table 47 Weight of the influential factors of Respondent 7**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.333 | 0.333 | 0.333 | |
| Factor1 | 0.087 | 0.064 | 0.101 | 0.084 |
| Factor2 | 0.120 | 0.103 | 0.087 | 0.103 |
| Factor3 | 0.094 | 0.113 | 0.121 | 0.109 |
| Factor4 | 0.128 | 0.110 | 0.171 | 0.136 |
| Factor5 | 0.159 | 0.148 | 0.156 | 0.154 |
| Factor6 | 0.115 | 0.136 | 0.116 | 0.122 |
| Factor7 | 0.165 | 0.125 | 0.116 | 0.135 |
| Factor8 | 0.132 | 0.203 | 0.132 | 0.156 |

**Table 48 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 8**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 3 | | | | | |
| Social | 1/3 | 1 | 2 | | | | | |
| Environmental | 1/3 | 1/2 | 1 | | | | | |
| Weight | 0.589 | 0.252 | 0.159 | | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 49 Pairwise comparison matrix: Economic aspect of Respondent 8**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 |
| Factor5 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 |
| Factor6 | 7 | 1 | 5 | 1 | 1 | 1 | 3 | 1 |
| Factor7 | 1/3 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1 | 1 |
| Weight | 0.108 | 0.127 | 0.095 | 0.144 | 0.162 | 0.224 | 0.055 | 0.085 |
| Consistency | λmax | 8.910 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 50 Pairwise comparison matrix: Social aspect of Respondent 8**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/5 | 1 | 1 | 1/5 | 1 | 1 | 1 |
| Factor2 | 5 | 1 | 3 | 1 | 1 | 1 | 3 | 1 |
| Factor3 | 1 | 1/3 | 1 | 3 | 1 | 1 | 1 | 1 |
| Factor4 | 1 | 1 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1/5 |
| Factor5 | 5 | 1 | 1 | 3 | 1 | 1 | 5 | 1 |
| Factor6 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 1/3 | 1 | 3 | 1/5 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 |
| Weight | 0.080 | 0.191 | 0.113 | 0.059 | 0.196 | 0.127 | 0.095 | 0.139 |
| Consistency | λmax | 8.913 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 51 Pairwise comparison matrix: Environmental aspect of Respondent 8**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 3 | 1 | 1 | 1/7 | 7 | 1 |
| Factor2 | 3 | 1 | 2 | 1 | 2 | 1/7 | 2 | 1 |
| Factor3 | 1/3 | 1/2 | 1 | 1 | 2 | 1/5 | 3 | 3 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1/4 | 3 | 2 |
| Factor5 | 1 | 1/2 | 1/2 | 1 | 1 | 1/7 | 5 | 2 |
| Factor6 | 7 | 7 | 5 | 4 | 7 | 1 | 7 | 6 |
| Factor7 | 1/7 | 1/2 | 1/3 | 1/3 | 1/5 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1 | 1/3 | 1/2 | 1/2 | 1/6 | 5 | 1 |
| Weight | 0.104 | 0.109 | 0.093 | 0.091 | 0.082 | 0.422 | 0.029 | 0.069 |
| Consistency | λmax | 8.981 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 52 Weight of the influential factors of Respondent 8**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.589 | 0.252 | 0.159 | |
| Factor1 | 0.108 | 0.080 | 0.104 | 0.100 |
| Factor2 | 0.127 | 0.191 | 0.109 | 0.140 |
| Factor3 | 0.095 | 0.113 | 0.093 | 0.099 |
| Factor4 | 0.144 | 0.059 | 0.091 | 0.114 |
| Factor5 | 0.162 | 0.196 | 0.082 | 0.158 |
| Factor6 | 0.224 | 0.127 | 0.422 | 0.231 |
| Factor7 | 0.055 | 0.095 | 0.029 | 0.061 |
| Factor8 | 0.085 | 0.139 | 0.069 | 0.096 |

**Table 53 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 9**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 3 | | | | | |
| Social | 1/3 | 1 | 1 | | | | | |
| Environmental | 1/3 | 1 | 1 | | | | | |
| Weight | 0.600 | 0.200 | 0.200 | | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 54 Pairwise comparison matrix: Economic aspect of Respondent 9**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 3 | 7 | 3 | 1/3 | 1 | 1/3 |
| Factor2 | 1/5 | 1 | 1 | 1 | 1 | 1/7 | 1/3 | 1/5 |
| Factor3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1/7 | 1/3 | 1/5 |
| Factor4 | 1/7 | 1 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 1 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor6 | 3 | 7 | 7 | 7 | 7 | 1 | 5 | 7 |
| Factor7 | 1 | 3 | 3 | 1 | 1 | 1/5 | 1 | 1 |
| Factor8 | 3 | 5 | 5 | 3 | 3 | 1/7 | 1 | 1 |
| Weight | 0.151 | 0.040 | 0.033 | 0.058 | 0.061 | 0.402 | 0.092 | 0.163 |
| Consistency | λmax | 8.773 | CI | 0.110 | RI | 1.41 | CR | 0.08 |

**Table 55 Pairwise comparison matrix: Social aspect of Respondent 9**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1/3 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor5 | 1 | 1 | 1/3 | 3 | 1 | 1/7 | 1/3 | 1/3 |
| Factor6 | 7 | 7 | 3 | 7 | 7 | 1 | 5 | 3 |
| Factor7 | 1 | 1/3 | 1 | 1 | 3 | 1/5 | 1 | 1/3 |
| Factor8 | 1 | 1 | 1 | 1 | 3 | 1/3 | 3 | 1 |
| Weight | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 |
| Consistency | λmax | 8.943 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 56 Pairwise comparison matrix: Environmental aspect of Respondent 9**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 5 | 1 | 1/5 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 3 |
| Factor3 | 1/3 | 1 | 1 | 3 | 1/5 | 1/3 | 1/7 | 1 |
| Factor4 | 1/5 | 1/3 | 1/3 | 1 | 1/3 | 1/7 | 1/5 | 1 |
| Factor5 | 1 | 1 | 5 | 3 | 1 | 1 | 1 | 1 |
| Factor6 | 5 | 1 | 3 | 7 | 1 | 1 | 3 | 5 |
| Factor7 | 1 | 1 | 7 | 5 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1/3 | 1 | 1 | 1 | 1/5 | 1 | 1 |
| Weight | 0.119 | 0.140 | 0.067 | 0.038 | 0.146 | 0.265 | 0.147 | 0.077 |
| Consistency | λmax | 8.960 | CI | 0.137 | RI | 1.41 | CR | 0.10 |

**Table 57 Weight of the influential factors of Respondent 9**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.600 | 0.200 | 0.200 | |
| Factor1 | 0.151 | 0.091 | 0.119 | 0.133 |
| Factor2 | 0.040 | 0.085 | 0.140 | 0.069 |
| Factor3 | 0.033 | 0.098 | 0.067 | 0.053 |
| Factor4 | 0.058 | 0.071 | 0.038 | 0.057 |
| Factor5 | 0.061 | 0.067 | 0.146 | 0.079 |
| Factor6 | 0.402 | 0.398 | 0.265 | 0.374 |
| Factor7 | 0.092 | 0.076 | 0.147 | 0.100 |
| Factor8 | 0.163 | 0.114 | 0.077 | 0.136 |

**Table 58 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 10**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 3 | | | | |
| Social | 1 | 1 | 3 | | | | |
| Environmental | 1/3 | 1/3 | 1 | | | | |
| Weight | 0.429 | 0.429 | 0.143 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 59 Pairwise comparison matrix: Economic aspect of Respondent 10**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1/3 | 3 | 1/5 | 5 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1/3 | 3 | 1/3 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1/3 | 3 | 1 |
| Factor4 | 3 | 3 | 1 | 1 | 1 | 1/3 | 3 | 1 |
| Factor5 | 1/3 | 1/3 | 1/3 | 1 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 5 | 3 | 3 | 3 | 7 | 1 | 7 | 3 |
| Factor7 | 1/5 | 1 | 1/3 | 1/3 | 1/3 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1 | 1 | 1 | 3 | 1/3 | 5 | 1 |
| Weight | 0.122 | 0.084 | 0.110 | 0.138 | 0.058 | 0.331 | 0.037 | 0.119 |
| Consistency | λmax | 8.782 | CI | 0.112 | RI | 1.41 | CR | 0.08 |

**Table 60 Pairwise comparison matrix: Social aspect of Respondent 10**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1/3 | 3 | 1 | 1/3 | 1 |
| Factor2 | 1 | 1 | 5 | 1/3 | 3 | 1 | 1 | 1 |
| Factor3 | 1 | 1/5 | 1 | 1/3 | 1 | 1 | 1 | 1/5 |
| Factor4 | 3 | 3 | 3 | 1 | 5 | 1 | 1 | 1 |
| Factor5 | 1/3 | 1/3 | 1 | 1/5 | 1 | 1 | 1/3 | 1/3 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 3 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 5 | 1 | 3 | 1 | 1 | 1 |
| Weight | 0.100 | 0.141 | 0.073 | 0.207 | 0.055 | 0.116 | 0.151 | 0.157 |
| Consistency | λmax | 8.738 | CI | 0.105 | RI | 1.41 | CR | 0.07 |

**Table 61 Pairwise comparison matrix: Environmental aspect of Respondent 10**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/5 | 3 | 1 | 1 | 1/5 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 |
| Factor3 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor4 | 1/3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.112 | 0.104 | 0.149 | 0.111 | 0.117 | 0.117 | 0.174 | 0.117 |
| Consistency | λmax | 8.801 | CI | 0.114 | RI | 1.41 | CR | 0.08 |

**Table 62 Weight of the influential factors of Respondent 10**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.429 | 0.429 | 0.143 | |
| Factor1 | 0.122 | 0.100 | 0.112 | 0.111 |
| Factor2 | 0.084 | 0.141 | 0.104 | 0.111 |
| Factor3 | 0.110 | 0.073 | 0.149 | 0.100 |
| Factor4 | 0.138 | 0.207 | 0.111 | 0.164 |
| Factor5 | 0.058 | 0.055 | 0.117 | 0.065 |
| Factor6 | 0.331 | 0.116 | 0.117 | 0.209 |
| Factor7 | 0.037 | 0.151 | 0.174 | 0.106 |
| Factor8 | 0.119 | 0.157 | 0.117 | 0.135 |

**Table 63 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 11**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 2 | | | | |
| Social | 1 | 1 | 1 | | | | |
| Environmental | 1/2 | 1 | 1 | | | | |
| Weight | 0.411 | 0.328 | 0.261 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 64 Pairwise comparison matrix: Economic aspect of Respondent 11**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 5 |
| Factor2 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1 | 1/3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1/3 | 1/3 | 1 | 3 |
| Factor4 | 1 | 3 | 1 | 1 | 1 | 1/3 | 1/3 | 3 |
| Factor5 | 1 | 3 | 3 | 1 | 1 | 1 | 3 | 1 |
| Factor6 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 5 |
| Factor7 | 1 | 3 | 1 | 3 | 1/3 | 1 | 1 | 3 |
| Factor8 | 1/5 | 1 | 1/3 | 1/3 | 1 | 1/5 | 1/3 | 1 |
| Weight | 0.151 | 0.068 | 0.096 | 0.116 | 0.182 | 0.181 | 0.150 | 0.055 |
| Consistency | λmax | 8.956 | CI | 0.137 | RI | 1.41 | CR | 0.10 |

**Table 65 Pairwise comparison matrix: Social aspect of Respondent 11**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 5 | 1 | 1 | 1 | 1/3 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 1/3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 | 1/3 |
| Factor4 | 1/5 | 1 | 1 | 1 | 1/3 | 1 | 1/5 | 1/5 |
| Factor5 | 1 | 3 | 5 | 3 | 1 | 1 | 1 | 1/3 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/5 |
| Factor7 | 1 | 3 | 1 | 5 | 1 | 1 | 1 | 1 |
| Factor8 | 3 | 1 | 3 | 5 | 3 | 5 | 1 | 1 |
| Weight | 0.134 | 0.079 | 0.080 | 0.052 | 0.158 | 0.089 | 0.153 | 0.255 |
| Consistency | λmax | 8.919 | CI | 0.131 | RI | 1.41 | CR | 0.09 |

**Table 66 Pairwise comparison matrix: Environmental aspect of Respondent 11**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1 | 1/5 | 1 | 3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 3 | 1 | 3 | 1 | 1 |
| Factor4 | 1 | 1 | 1/3 | 1 | 1/5 | 1 | 1/3 | 1 |
| Factor5 | 5 | 1 | 1 | 5 | 1 | 1 | 5 | 1 |
| Factor6 | 1 | 1 | 1/3 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1/3 | 1 | 1 | 3 | 1/5 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.100 | 0.113 | 0.173 | 0.075 | 0.220 | 0.100 | 0.105 | 0.113 |
| Consistency | λmax | 8.927 | CI | 0.132 | RI | 1.41 | CR | 0.09 |

**Table 67 Weight of the influential factors of Respondent 11**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.411 | 0.328 | 0.261 | |
| Factor1 | 0.151 | 0.134 | 0.100 | 0.132 |
| Factor2 | 0.068 | 0.079 | 0.113 | 0.084 |
| Factor3 | 0.096 | 0.080 | 0.173 | 0.111 |
| Factor4 | 0.116 | 0.052 | 0.075 | 0.084 |
| Factor5 | 0.182 | 0.158 | 0.220 | 0.184 |
| Factor6 | 0.181 | 0.089 | 0.100 | 0.130 |
| Factor7 | 0.150 | 0.153 | 0.105 | 0.139 |
| Factor8 | 0.055 | 0.255 | 0.113 | 0.136 |

**Table 68 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 12**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 1/3 | | | | | |
| Social | 1 | 1 | 1/3 | | | | | |
| Environmental | 3 | 3 | 1 | | | | | |
| Weight | 0.200 | 0.200 | 0.600 | | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 69 Pairwise comparison matrix: Economic aspect of Respondent 12**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 1 | 1 | 3 | 1/6 | 4 | 6 |
| Factor2 | 1/5 | 1 | 1/3 | 1/3 | 1 | 1/6 | 1 | 3 |
| Factor3 | 1 | 3 | 1 | 1 | 5 | 1/5 | 5 | 4 |
| Factor4 | 1 | 3 | 1 | 1 | 5 | 1/7 | 4 | 4 |
| Factor5 | 1/3 | 1 | 1/5 | 1/5 | 1 | 1/7 | 1/3 | 1/3 |
| Factor6 | 6 | 6 | 5 | 7 | 7 | 1 | 5 | 5 |
| Factor7 | 1/4 | 1 | 1/5 | 1/4 | 3 | 1/5 | 1 | 1/2 |
| Factor8 | 1/6 | 1/3 | 1/4 | 1/4 | 3 | 1/5 | 2 | 1 |
| Weight | 0.145 | 0.052 | 0.139 | 0.130 | 0.032 | 0.403 | 0.048 | 0.052 |
| Consistency | λmax | 8.942 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 70 Pairwise comparison matrix: Social aspect of Respondent 12**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 3 | 2 | 6 | 1/4 | 7 | 1 |
| Factor2 | 1/5 | 1 | 1/4 | 1/2 | 1 | 1/7 | 1 | 1/7 |
| Factor3 | 1/3 | 4 | 1 | 1/2 | 3 | 1/4 | 4 | 1/2 |
| Factor4 | 1/2 | 2 | 2 | 1 | 3 | 1/7 | 4 | 1/3 |
| Factor5 | 1/6 | 1 | 1/3 | 1/3 | 1 | 1/8 | 4 | 1/3 |
| Factor6 | 4 | 7 | 4 | 7 | 8 | 1 | 7 | 6 |
| Factor7 | 1/7 | 1 | 1/4 | 1/4 | 1/4 | 1/7 | 1 | 1/7 |
| Factor8 | 1 | 7 | 2 | 3 | 3 | 1/6 | 7 | 1 |
| Weight | 0.168 | 0.033 | 0.087 | 0.087 | 0.044 | 0.399 | 0.026 | 0.156 |
| Consistency | λmax | 8.655 | CI | 0.094 | RI | 1.41 | CR | 0.07 |

**Table 71 Pairwise comparison matrix: Environmental aspect of Respondent 12**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor5 | 1/3 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor6 | 1 | 1/3 | 1/3 | 3 | 3 | 1 | 3 | 1 |
| Factor7 | 1 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.135 | 0.160 | 0.139 | 0.106 | 0.095 | 0.157 | 0.093 | 0.114 |
| Consistency | λmax | 8.824 | CI | 0.118 | RI | 1.41 | CR | 0.08 |

**Table 72 Weight of the influential factors of Respondent 12**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.200 | 0.200 | 0.600 | |
| Factor1 | 0.145 | 0.168 | 0.135 | 0.144 |
| Factor2 | 0.052 | 0.033 | 0.160 | 0.113 |
| Factor3 | 0.139 | 0.087 | 0.139 | 0.129 |
| Factor4 | 0.130 | 0.087 | 0.106 | 0.107 |
| Factor5 | 0.032 | 0.044 | 0.095 | 0.072 |
| Factor6 | 0.403 | 0.399 | 0.157 | 0.255 |
| Factor7 | 0.048 | 0.026 | 0.093 | 0.071 |
| Factor8 | 0.052 | 0.156 | 0.114 | 0.110 |

**Table 73 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 13**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 3 | | | | |
| Social | 1/3 | 1 | 1 | | | | |
| Environmental | 1/3 | 1 | 1 | | | | |
| Weight | 0.600 | 0.200 | 0.200 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 74 Pairwise comparison matrix: Economic aspect of Respondent 13**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor2 | 1 | 1 | 3 | 1 | 1/3 | 1/5 | 3 | 1 |
| Factor3 | 3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 3 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/5 | 1/7 | 1 | 1 |
| Factor5 | 1 | 3 | 3 | 5 | 1 | 1/5 | 3 | 1 |
| Factor6 | 3 | 5 | 3 | 7 | 5 | 1 | 7 | 7 |
| Factor7 | 1 | 1/3 | 1/3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 3 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Weight | 0.068 | 0.097 | 0.095 | 0.061 | 0.153 | 0.381 | 0.043 | 0.101 |
| Consistency | λmax | 8.942 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 75 Pairwise comparison matrix: Social aspect of Respondent 13**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 3 | 1 | 3 | 1/7 | 7 | 1 |
| Factor2 | 3 | 1 | 3 | 1 | 1 | 1/7 | 5 | 3 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1 | 1/7 | 3 | 1/3 |
| Factor4 | 1 | 1 | 3 | 1 | 3 | 1/6 | 5 | 5 |
| Factor5 | 1/3 | 1 | 1 | 1/3 | 1 | 1/7 | 3 | 2 |
| Factor6 | 7 | 7 | 7 | 6 | 7 | 1 | 7 | 5 |
| Factor7 | 1/7 | 1/5 | 1/3 | 1/5 | 1/3 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1/3 | 3 | 1/5 | 1/2 | 1/5 | 5 | 1 |
| Weight | 0.105 | 0.123 | 0.046 | 0.136 | 0.065 | 0.429 | 0.024 | 0.073 |
| Consistency | λmax | 8.979 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 76 Pairwise comparison matrix: Environmental aspect of Respondent 13**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/7 | 1/5 | 1/5 | 1 | 1/3 | 1 | 1/3 |
| Factor2 | 7 | 1 | 1 | 1 | 3 | 1 | 3 | 5 |
| Factor3 | 5 | 1 | 1 | 1 | 1 | 3 | 1 | 3 |
| Factor4 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 1 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor6 | 3 | 1 | 1/3 | 1 | 3 | 1 | 3 | 1 |
| Factor7 | 1 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 3 |
| Factor8 | 3 | 1/5 | 1/3 | 1 | 1 | 1 | 1/3 | 1 |
| Weight | 0.045 | 0.218 | 0.180 | 0.133 | 0.087 | 0.152 | 0.103 | 0.082 |
| Consistency | λmax | 8.931 | CI | 0.133 | RI | 1.41 | CR | 0.09 |

**Table 77 Weight of the influential factors of Respondent 13**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.600 | 0.200 | 0.200 | |
| Factor1 | 0.068 | 0.105 | 0.045 | 0.071 |
| Factor2 | 0.097 | 0.123 | 0.218 | 0.126 |
| Factor3 | 0.095 | 0.046 | 0.180 | 0.102 |
| Factor4 | 0.061 | 0.136 | 0.133 | 0.090 |
| Factor5 | 0.153 | 0.065 | 0.087 | 0.122 |
| Factor6 | 0.381 | 0.429 | 0.152 | 0.345 |
| Factor7 | 0.043 | 0.024 | 0.103 | 0.051 |
| Factor8 | 0.101 | 0.073 | 0.082 | 0.092 |

**Table 78 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 14**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 2 | 3 | | | | | |
| Social | 1/2 | 1 | 2 | | | | | |
| Environmental | 1/3 | 1/2 | 1 | | | | | |
| Weight | 0.539 | 0.297 | 0.164 | | | | | |
| Consistency | λmax | 3.009 | CI | 0.005 | RI | 0.58 | CR | 0.01 |

**Table 79 Pairwise comparison matrix: Economic aspect of Respondent 14**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1 | 1/3 | 1 | 1/5 | 1 |
| Factor2 | 1 | 1 | 3 | 5 | 1 | 3 | 1 | 1 |
| Factor3 | 3 | 1/3 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor4 | 1 | 1/5 | 1 | 1 | 1 | 1 | 1/3 | 1 |
| Factor5 | 3 | 1 | 1 | 1 | 1 | 5 | 1 | 1 |
| Factor6 | 1 | 1/3 | 1/3 | 1 | 1/5 | 1 | 1/3 | 1 |
| Factor7 | 5 | 1 | 1 | 3 | 1 | 3 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.076 | 0.194 | 0.131 | 0.084 | 0.159 | 0.062 | 0.178 | 0.115 |
| Consistency | λmax | 8.759 | CI | 0.108 | RI | 1.41 | CR | 0.08 |

**Table 80 Pairwise comparison matrix: Social aspect of Respondent 14**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 5 | 3 | 1 | 1 | 3 | 3 |
| Factor2 | 1/3 | 1 | 3 | 3 | 1/3 | 1/7 | 5 | 1 |
| Factor3 | 1/5 | 1/3 | 1 | 1/3 | 1/5 | 1/7 | 1 | 1/3 |
| Factor4 | 1/3 | 1/3 | 3 | 1 | 1/3 | 1/7 | 3 | 1/3 |
| Factor5 | 1 | 3 | 5 | 3 | 1 | 1/3 | 3 | 1 |
| Factor6 | 1 | 7 | 7 | 7 | 3 | 1 | 5 | 7 |
| Factor7 | 1/3 | 1/5 | 1 | 1/3 | 1/3 | 1/5 | 1 | 1/3 |
| Factor8 | 1/3 | 1 | 3 | 3 | 1 | 1/7 | 3 | 1 |
| Weight | 0.192 | 0.095 | 0.032 | 0.061 | 0.147 | 0.337 | 0.039 | 0.096 |
| Consistency | λmax | 8.687 | CI | 0.098 | RI | 1.41 | CR | 0.07 |

**Table 81 Pairwise comparison matrix: Environmental aspect of Respondent 14**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 1 | 1/3 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 3 | 1 | 1 | 3 | 1 | 1 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1 | 1 | 1 | 1 |
| Factor4 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 1/3 |
| Factor5 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor6 | 1 | 1/3 | 1 | 1 | 1/3 | 1 | 3 | 1 |
| Factor7 | 1 | 1 | 1 | 1/3 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| Weight | 0.118 | 0.153 | 0.082 | 0.140 | 0.162 | 0.109 | 0.096 | 0.142 |
| Consistency | λmax | 8.958 | CI | 0.137 | RI | 1.41 | CR | 0.10 |

**Table 82 Weight of the influential factors of Respondent 14**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.539 | 0.297 | 0.164 | |
| Factor1 | 0.076 | 0.192 | 0.118 | 0.117 |
| Factor2 | 0.194 | 0.095 | 0.153 | 0.158 |
| Factor3 | 0.131 | 0.032 | 0.082 | 0.093 |
| Factor4 | 0.084 | 0.061 | 0.140 | 0.087 |
| Factor5 | 0.159 | 0.147 | 0.162 | 0.156 |
| Factor6 | 0.062 | 0.337 | 0.109 | 0.152 |
| Factor7 | 0.178 | 0.039 | 0.096 | 0.124 |
| Factor8 | 0.115 | 0.096 | 0.142 | 0.114 |

**Table 83 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 15**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 2 | | | | |
| Social | 1 | 1 | 2 | | | | |
| Environmental | 1/2 | 1/2 | 1 | | | | |
| Weight | 0.400 | 0.400 | 0.200 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 84 Pairwise comparison matrix: Economic aspect of Respondent 15**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 5 | 1 | 1/3 | 1 | 1/3 |
| Factor2 | 1/3 | 1 | 3 | 1 | 1 | 1/7 | 1/3 | 1/5 |
| Factor3 | 1 | 1/3 | 1 | 1/3 | 1/3 | 1/7 | 1/3 | 1/5 |
| Factor4 | 1/5 | 1 | 3 | 1 | 1/3 | 1/5 | 1 | 1/5 |
| Factor5 | 1 | 1 | 3 | 3 | 1 | 1/7 | 1 | 1/3 |
| Factor6 | 3 | 7 | 7 | 5 | 7 | 1 | 7 | 3 |
| Factor7 | 1 | 3 | 3 | 1 | 1 | 1/7 | 1 | 1 |
| Factor8 | 3 | 5 | 5 | 5 | 3 | 1/3 | 1 | 1 |
| Weight | 0.106 | 0.053 | 0.038 | 0.055 | 0.082 | 0.379 | 0.095 | 0.191 |
| Consistency | λmax | 8.876 | CI | 0.125 | RI | 1.41 | CR | 0.09 |

**Table 85 Pairwise comparison matrix: Social aspect of Respondent 15**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/5 | 3 | 1 | 1/3 | 1 | 1 | 1 |
| Factor2 | 5 | 1 | 3 | 5 | 1 | 1 | 5 | 5 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1/3 | 1/5 | 1 | 1 |
| Factor4 | 1 | 1/5 | 3 | 1 | 1/3 | 1/5 | 1 | 1 |
| Factor5 | 3 | 1 | 3 | 3 | 1 | 3 | 1 | 1 |
| Factor6 | 1 | 1 | 5 | 5 | 1/3 | 1 | 3 | 1 |
| Factor7 | 1 | 1/5 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1/5 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.085 | 0.268 | 0.052 | 0.072 | 0.190 | 0.168 | 0.077 | 0.088 |
| Consistency | λmax | 8.922 | CI | 0.132 | RI | 1.41 | CR | 0.09 |

**Table 86 Pairwise comparison matrix: Environmental aspect of Respondent 15**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 1 |
| Factor2 | 1 | 1 | 1/3 | 1 | 1 | 1/5 | 3 | 1/3 |
| Factor3 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 3 |
| Factor4 | 1/3 | 1 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1 |
| Factor5 | 1/3 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor6 | 1 | 5 | 1 | 3 | 7 | 1 | 3 | 3 |
| Factor7 | 1/3 | 1/3 | 1/3 | 3 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 3 | 1/3 | 1 | 1 | 1/3 | 1 | 1 |
| Weight | 0.162 | 0.086 | 0.184 | 0.056 | 0.091 | 0.249 | 0.075 | 0.097 |
| Consistency | λmax | 8.928 | CI | 0.133 | RI | 1.41 | CR | 0.09 |

**Table 87 Weight of the influential factors of Respondent 15**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.400 | 0.400 | 0.200 | |
| Factor1 | 0.106 | 0.085 | 0.162 | 0.109 |
| Factor2 | 0.053 | 0.268 | 0.086 | 0.146 |
| Factor3 | 0.038 | 0.052 | 0.184 | 0.073 |
| Factor4 | 0.055 | 0.072 | 0.056 | 0.062 |
| Factor5 | 0.082 | 0.190 | 0.091 | 0.127 |
| Factor6 | 0.379 | 0.168 | 0.249 | 0.269 |
| Factor7 | 0.095 | 0.077 | 0.075 | 0.084 |
| Factor8 | 0.191 | 0.088 | 0.097 | 0.131 |

**Table 88 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 16**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 1 | | | | |
| Social | 1 | 1 | 1 | | | | |
| Environmental | 1 | 1 | 1 | | | | |
| Weight | 0.333 | 0.333 | 0.333 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 89 Pairwise comparison matrix: Economic aspect of Respondent 16**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1/3 | 3 | 7 | 1/5 | 7 | 9 |
| Factor2 | 1/3 | 1 | 1/3 | 1/4 | 3 | 1/9 | 3 | 5 |
| Factor3 | 3 | 3 | 1 | 5 | 5 | 1/5 | 7 | 7 |
| Factor4 | 1/3 | 4 | 1/5 | 1 | 5 | 1/7 | 5 | 5 |
| Factor5 | 1/7 | 1/3 | 1/5 | 1/5 | 1 | 1/9 | 1/2 | 1/2 |
| Factor6 | 5 | 9 | 5 | 7 | 9 | 1 | 9 | 8 |
| Factor7 | 1/7 | 1/3 | 1/7 | 1/5 | 2 | 1/9 | 1 | 1/2 |
| Factor8 | 1/9 | 1/5 | 1/7 | 1/5 | 2 | 1/8 | 2 | 1 |
| Weight | 0.153 | 0.064 | 0.190 | 0.102 | 0.023 | 0.409 | 0.027 | 0.032 |
| Consistency | λmax | 9.083 | CI | 0.155 | RI | 1.41 | CR | 0.11 |

**Table 90 Pairwise comparison matrix: Social aspect of Respondent 16**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 2 | 5 | 1/7 | 7 | 1 |
| Factor2 | 1/3 | 1 | 1/3 | 1/2 | 2 | 1/7 | 3 | 1/7 |
| Factor3 | 1/3 | 3 | 1 | 1 | 3 | 1/7 | 3 | 1/3 |
| Factor4 | 1/2 | 2 | 1 | 1 | 2 | 1/7 | 3 | 1/3 |
| Factor5 | 1/5 | 1/2 | 1/3 | 1/2 | 1 | 1/9 | 5 | 1 |
| Factor6 | 7 | 7 | 7 | 7 | 9 | 1 | 7 | 7 |
| Factor7 | 1/7 | 1/3 | 1/3 | 1/3 | 1/5 | 1/7 | 1 | 1/7 |
| Factor8 | 1 | 7 | 3 | 3 | 1 | 1/7 | 7 | 1 |
| Weight | 0.139 | 0.048 | 0.075 | 0.066 | 0.053 | 0.448 | 0.024 | 0.147 |
| Consistency | λmax | 9.040 | CI | 0.149 | RI | 1.41 | CR | 0.11 |

**Table 91 Pairwise comparison matrix: Environmental aspect of Respondent 16**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/5 | 5 | 1 | 1 | 1/7 | 7 | 1 |
| Factor2 | 5 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor3 | 1/5 | 1 | 1 | 1 | 1 | 1/7 | 5 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1/5 | 5 | 1 |
| Factor5 | 1 | 1 | 1 | 1 | 1 | 1/7 | 5 | 1 |
| Factor6 | 7 | 7 | 7 | 5 | 7 | 1 | 7 | 7 |
| Factor7 | 1/7 | 1/3 | 1/5 | 1/5 | 1/5 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1/7 | 5 | 1 |
| Weight | 0.108 | 0.104 | 0.074 | 0.084 | 0.080 | 0.446 | 0.024 | 0.080 |
| Consistency | λmax | 9.049 | CI | 0.150 | RI | 1.41 | CR | 0.11 |

**Table 92 Weight of the influential factors of Respondent 16**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.333 | 0.333 | 0.333 | |
| Factor1 | 0.153 | 0.139 | 0.108 | 0.133 |
| Factor2 | 0.064 | 0.048 | 0.104 | 0.072 |
| Factor3 | 0.190 | 0.075 | 0.074 | 0.113 |
| Factor4 | 0.102 | 0.066 | 0.084 | 0.084 |
| Factor5 | 0.023 | 0.053 | 0.080 | 0.052 |
| Factor6 | 0.409 | 0.448 | 0.446 | 0.434 |
| Factor7 | 0.027 | 0.024 | 0.024 | 0.025 |
| Factor8 | 0.032 | 0.147 | 0.080 | 0.086 |

**Table 93 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 17**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 2 | | | | |
| Social | 1/3 | 1 | 1/3 | | | | |
| Environmental | 1/2 | 3 | 1 | | | | |
| Weight | 0.525 | 0.142 | 0.334 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 94 Pairwise comparison matrix: Economic aspect of Respondent 17**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 5 | 1/7 | 7 | 5 |
| Factor2 | 1 | 1 | 1/2 | 1 | 5 | 1/8 | 1 | 3 |
| Factor3 | 1 | 2 | 1 | 1 | 5 | 1/5 | 5 | 4 |
| Factor4 | 1 | 1 | 1 | 1 | 5 | 1/9 | 5 | 5 |
| Factor5 | 1/5 | 1/5 | 1/5 | 1/5 | 1 | 1/9 | 1/3 | 1/3 |
| Factor6 | 7 | 8 | 5 | 9 | 9 | 1 | 5 | 5 |
| Factor7 | 1/7 | 1 | 1/5 | 1/5 | 3 | 1/5 | 1 | 1 |
| Factor8 | 1/5 | 1/3 | 1/4 | 1/5 | 3 | 1/5 | 1 | 1 |
| Weight | 0.128 | 0.081 | 0.125 | 0.117 | 0.022 | 0.437 | 0.047 | 0.043 |
| Consistency | λmax | 8.909 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 95 Pairwise comparison matrix: Social aspect of Respondent 17**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 2 | 2 | 7 | 4 | 1/3 | 7 | 2 |
| Factor2 | 1/2 | 1 | 1 | 1 | 1/2 | 1/5 | 5 | 1/7 |
| Factor3 | 1/2 | 1 | 1 | 1 | 1 | 1/4 | 5 | 1/2 |
| Factor4 | 1/7 | 1 | 1 | 1 | 1 | 1/7 | 4 | 1/3 |
| Factor5 | 1/4 | 2 | 1 | 1 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 3 | 5 | 4 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1/7 | 1/5 | 1/5 | 1/4 | 1/3 | 1/7 | 1 | 1/7 |
| Factor8 | 1/2 | 7 | 2 | 3 | 3 | 1/7 | 7 | 1 |
| Weight | 0.185 | 0.065 | 0.075 | 0.057 | 0.062 | 0.378 | 0.022 | 0.156 |
| Consistency | λmax | 8.774 | CI | 0.111 | RI | 1.41 | CR | 0.08 |

**Table 96 Pairwise comparison matrix: Environmental aspect of Respondent 17**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 5 | 1 | 3 | 3 | 1 | 1 |
| Factor2 | 1/5 | 1 | 5 | 1 | 1 | 1 | 1 | 1/3 |
| Factor3 | 1/5 | 1/5 | 1 | 1 | 1 | 3 | 1 | 1/3 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor5 | 1/3 | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Factor6 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1 | 1 | 1/3 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 3 | 3 | 1 | 1 | 3 | 1 | 1 |
| Weight | 0.223 | 0.110 | 0.088 | 0.129 | 0.113 | 0.060 | 0.115 | 0.162 |
| Consistency | λmax | 8.975 | CI | 0.139 | RI | 1.41 | CR | 0.10 |

**Table 97 Weight of the influential factors of Respondent 17**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.525 | 0.142 | 0.334 | |
| Factor1 | 0.128 | 0.185 | 0.223 | 0.168 |
| Factor2 | 0.081 | 0.065 | 0.110 | 0.088 |
| Factor3 | 0.125 | 0.075 | 0.088 | 0.106 |
| Factor4 | 0.117 | 0.057 | 0.129 | 0.112 |
| Factor5 | 0.022 | 0.062 | 0.113 | 0.058 |
| Factor6 | 0.437 | 0.378 | 0.060 | 0.303 |
| Factor7 | 0.047 | 0.022 | 0.115 | 0.066 |
| Factor8 | 0.043 | 0.156 | 0.162 | 0.099 |

**Table 98 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 18**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 5 | 5 | | | | |
| Social | 1/5 | 1 | 1 | | | | |
| Environmental | 1/5 | 1 | 1 | | | | |
| Weight | 0.714 | 0.143 | 0.143 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 99 Pairwise comparison matrix: Economic aspect of Respondent 18**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 5 | 5 | 1 | 3 | 1/3 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1/3 | 1/7 | 1/3 | 1/3 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1/3 |
| Factor4 | 1/5 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor5 | 1/5 | 3 | 1 | 1 | 1 | 1/5 | 1 | 1/3 |
| Factor6 | 1 | 7 | 5 | 3 | 5 | 1 | 5 | 3 |
| Factor7 | 1/3 | 3 | 1 | 1 | 1 | 1/5 | 1 | 1/3 |
| Factor8 | 3 | 3 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Weight | 0.203 | 0.045 | 0.057 | 0.060 | 0.066 | 0.298 | 0.069 | 0.202 |
| Consistency | λmax | 8.543 | CI | 0.078 | RI | 1.41 | CR | 0.06 |

**Table 100 Pairwise comparison matrix: Social aspect of Respondent 18**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1/5 | 1/5 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/3 | 1/3 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1/7 | 1/5 | 1 | 1/3 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1/5 |
| Factor5 | 1 | 3 | 7 | 3 | 1 | 1 | 1 | 3 |
| Factor6 | 5 | 3 | 5 | 5 | 1 | 1 | 1 | 1 |
| Factor7 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 3 | 5 | 1/3 | 1 | 1 | 1 |
| Weight | 0.079 | 0.080 | 0.062 | 0.065 | 0.215 | 0.218 | 0.144 | 0.137 |
| Consistency | λmax | 8.983 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 101 Pairwise comparison matrix: Environmental aspect of Respondent 18**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 7 | 3 | 3 | 3 | 1 | 3 | 1 |
| Factor2 | 1/7 | 1 | 3 | 3 | 1 | 1/3 | 3 | 1 |
| Factor3 | 1/3 | 1/3 | 1 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor4 | 1/3 | 1/3 | 1 | 1 | 1 | 1/3 | 3 | 1/3 |
| Factor5 | 1/3 | 1 | 1 | 1 | 1 | 1/5 | 3 | 1/3 |
| Factor6 | 1 | 3 | 3 | 3 | 5 | 1 | 7 | 5 |
| Factor7 | 1/3 | 1/3 | 1 | 1/3 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 1 | 1 | 3 | 3 | 3 | 1/5 | 3 | 1 |
| Weight | 0.227 | 0.110 | 0.058 | 0.068 | 0.069 | 0.282 | 0.040 | 0.145 |
| Consistency | λmax | 8.735 | CI | 0.105 | RI | 1.41 | CR | 0.07 |

**Table 102 Weight of the influential factors of Respondent 18**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.714 | 0.143 | 0.143 | |
| Factor1 | 0.203 | 0.079 | 0.227 | 0.189 |
| Factor2 | 0.045 | 0.080 | 0.110 | 0.059 |
| Factor3 | 0.057 | 0.062 | 0.058 | 0.058 |
| Factor4 | 0.060 | 0.065 | 0.068 | 0.062 |
| Factor5 | 0.066 | 0.215 | 0.069 | 0.088 |
| Factor6 | 0.298 | 0.218 | 0.282 | 0.284 |
| Factor7 | 0.069 | 0.144 | 0.040 | 0.076 |
| Factor8 | 0.202 | 0.137 | 0.145 | 0.184 |

**Table 103 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 19**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 5 | 5 | | | | |
| Social | 1/5 | 1 | 1 | | | | |
| Environmental | 1/5 | 1 | 1 | | | | |
| Weight | 0.714 | 0.143 | 0.143 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 104 Pairwise comparison matrix: Economic aspect of Respondent 19**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 5 | 1 | 1/7 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor4 | 1/3 | 1/5 | 1/3 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor5 | 1 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor6 | 7 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1/7 | 5 | 1 |
| Weight | 0.079 | 0.089 | 0.079 | 0.042 | 0.079 | 0.477 | 0.061 | 0.096 |
| Consistency | λmax | 8.603 | CI | 0.086 | RI | 1.41 | CR | 0.06 |

**Table 105 Pairwise comparison matrix: Social aspect of Respondent 19**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 1/3 | 3 | 1 | 1/7 | 1 | 1 |
| Factor2 | 3 | 1 | 1 | 5 | 1 | 1/7 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor4 | 1/3 | 1/5 | 1/3 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor5 | 1 | 1 | 1 | 3 | 1 | 1/7 | 1 | 1 |
| Factor6 | 7 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Weight | 0.066 | 0.104 | 0.093 | 0.043 | 0.079 | 0.479 | 0.068 | 0.068 |
| Consistency | λmax | 8.509 | CI | 0.073 | RI | 1.41 | CR | 0.05 |

**Table 106 Pairwise comparison matrix: Environmental aspect of Respondent 19**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 1/3 | 1 | 1/5 | 1/7 | 1 | 1 |
| Factor2 | 3 | 1 | 1 | 5 | 1/5 | 1/7 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 3 | 1/5 | 1/7 | 1 | 1 |
| Factor4 | 1 | 1/5 | 1/3 | 1 | 1/5 | 1/7 | 1 | 1 |
| Factor5 | 5 | 5 | 5 | 5 | 1 | 1/7 | 1 | 1 |
| Factor6 | 7 | 7 | 7 | 7 | 7 | 1 | 7 | 7 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Weight | 0.045 | 0.087 | 0.077 | 0.044 | 0.168 | 0.450 | 0.064 | 0.064 |
| Consistency | λmax | 8.976 | CI | 0.139 | RI | 1.41 | CR | 0.10 |

**Table 107 Weight of the influential factors of Respondent 19**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.714 | 0.143 | 0.143 | |
| Factor1 | 0.079 | 0.066 | 0.045 | 0.072 |
| Factor2 | 0.089 | 0.104 | 0.087 | 0.091 |
| Factor3 | 0.079 | 0.093 | 0.077 | 0.080 |
| Factor4 | 0.042 | 0.043 | 0.044 | 0.042 |
| Factor5 | 0.079 | 0.079 | 0.168 | 0.091 |
| Factor6 | 0.477 | 0.479 | 0.450 | 0.473 |
| Factor7 | 0.061 | 0.068 | 0.064 | 0.062 |
| Factor8 | 0.096 | 0.068 | 0.064 | 0.087 |

**Table 108 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 20**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 1 | | | | |
| Social | 1 | 1 | 1/2 | | | | |
| Environmental | 1 | 2 | 1 | | | | |
| Weight | 0.328 | 0.261 | 0.411 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 109 Pairwise comparison matrix: Economic aspect of Respondent 20**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 5 | 3 | 1 | 1 | 1/5 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor3 | 1/5 | 1 | 1 | 1/3 | 1/7 | 1/3 | 1/3 | 1 |
| Factor4 | 1/3 | 1 | 3 | 1 | 1 | 1 | 1/5 | 1 |
| Factor5 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 5 | 1 | 3 | 5 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.136 | 0.114 | 0.057 | 0.099 | 0.145 | 0.124 | 0.209 | 0.114 |
| Consistency | λmax | 8.973 | CI | 0.139 | RI | 1.41 | CR | 0.10 |

**Table 110 Pairwise comparison matrix: Social aspect of Respondent 20**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 3 | 1/5 | 1/7 | 1 | 1/5 |
| Factor3 | 1 | 1 | 1 | 1 | 1/3 | 1/5 | 3 | 1/3 |
| Factor4 | 1 | 1/3 | 1 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor5 | 1 | 5 | 3 | 3 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 3 | 7 | 5 | 7 | 7 | 1 | 5 | 3 |
| Factor7 | 1 | 1 | 1/3 | 1 | 1/3 | 1/5 | 1 | 1/5 |
| Factor8 | 1 | 5 | 3 | 3 | 3 | 1/3 | 5 | 1 |
| Weight | 0.085 | 0.064 | 0.071 | 0.052 | 0.127 | 0.369 | 0.051 | 0.181 |
| Consistency | λmax | 8.833 | CI | 0.119 | RI | 1.41 | CR | 0.08 |

**Table 111 Pairwise comparison matrix: Environmental aspect of Respondent 20**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1/3 | 1 | 1 | 1 | 1/5 |
| Factor2 | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1/5 |
| Factor4 | 3 | 1 | 1 | 1 | 5 | 1 | 3 | 1 |
| Factor5 | 1 | 1/5 | 1 | 1/5 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1 | 1/3 |
| Factor8 | 5 | 1 | 5 | 1 | 1 | 1 | 3 | 1 |
| Weight | 0.074 | 0.144 | 0.111 | 0.181 | 0.082 | 0.113 | 0.084 | 0.209 |
| Consistency | λmax | 8.929 | CI | 0.133 | RI | 1.41 | CR | 0.09 |

**Table 112 Weight of the influential factors of Respondent 20**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.328 | 0.261 | 0.411 | |
| Factor1 | 0.136 | 0.085 | 0.074 | 0.097 |
| Factor2 | 0.114 | 0.064 | 0.144 | 0.114 |
| Factor3 | 0.057 | 0.071 | 0.111 | 0.083 |
| Factor4 | 0.099 | 0.052 | 0.181 | 0.120 |
| Factor5 | 0.145 | 0.127 | 0.082 | 0.115 |
| Factor6 | 0.124 | 0.369 | 0.113 | 0.184 |
| Factor7 | 0.209 | 0.051 | 0.084 | 0.117 |
| Factor8 | 0.114 | 0.181 | 0.209 | 0.171 |

**Table 113 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 21**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 3 | | | | |
| Social | 1/3 | 1 | 1/2 | | | | |
| Environmental | 1/3 | 2 | 1 | | | | |
| Weight | 0.589 | 0.159 | 0.252 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 114 Pairwise comparison matrix: Economic aspect of Respondent 21**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 2 | 5 | 1/5 | 6 | 6 |
| Factor2 | 1 | 1 | 1 | 1/3 | 3 | 1/7 | 2 | 5 |
| Factor3 | 1 | 1 | 1 | 2 | 4 | 1/7 | 7 | 7 |
| Factor4 | 1/2 | 3 | 1/2 | 1 | 2 | 1/7 | 3 | 4 |
| Factor5 | 1/5 | 1/3 | 1/4 | 1/2 | 1 | 1/7 | 1 | 1 |
| Factor6 | 5 | 7 | 7 | 7 | 7 | 1 | 8 | 6 |
| Factor7 | 1/6 | 1/2 | 1/7 | 1/3 | 1 | 1/8 | 1 | 1/3 |
| Factor8 | 1/6 | 1/5 | 1/7 | 1/4 | 1 | 1/6 | 3 | 1 |
| Weight | 0.140 | 0.090 | 0.139 | 0.096 | 0.035 | 0.430 | 0.030 | 0.040 |
| Consistency | λmax | 8.889 | CI | 0.127 | RI | 1.41 | CR | 0.09 |

**Table 115 Pairwise comparison matrix: Social aspect of Respondent 21**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 3 | 3 | 1/3 | 3 | 1/5 |
| Factor2 | 1 | 1 | 1 | 3 | 1 | 1/3 | 1 | 1/5 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1 | 1/5 | 1/3 | 1/5 |
| Factor4 | 1/3 | 1/3 | 1 | 1 | 1 | 1/7 | 1 | 1/5 |
| Factor5 | 1/3 | 1 | 1 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor6 | 3 | 3 | 5 | 7 | 7 | 1 | 3 | 3 |
| Factor7 | 1/3 | 1 | 3 | 1 | 1 | 1/3 | 1 | 1 |
| Factor8 | 5 | 5 | 5 | 5 | 3 | 1/3 | 1 | 1 |
| Weight | 0.129 | 0.081 | 0.049 | 0.047 | 0.056 | 0.319 | 0.091 | 0.229 |
| Consistency | λmax | 8.749 | CI | 0.107 | RI | 1.41 | CR | 0.08 |

**Table 116 Pairwise comparison matrix: Environmental aspect of Respondent 21**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 1 | 1/5 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1/7 | 1/3 | 1 | 1/5 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 5 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 3 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 3 | 5 | 1 | 1 | 1/3 | 1 | 1 |
| Weight | 0.109 | 0.104 | 0.065 | 0.114 | 0.192 | 0.154 | 0.114 | 0.149 |
| Consistency | λmax | 8.938 | CI | 0.134 | RI | 1.41 | CR | 0.10 |

**Table 117 Weight of the influential factors of Respondent 21**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.589 | 0.159 | 0.252 | |
| Factor1 | 0.140 | 0.129 | 0.109 | 0.130 |
| Factor2 | 0.090 | 0.081 | 0.104 | 0.092 |
| Factor3 | 0.139 | 0.049 | 0.065 | 0.106 |
| Factor4 | 0.096 | 0.047 | 0.114 | 0.093 |
| Factor5 | 0.035 | 0.056 | 0.192 | 0.078 |
| Factor6 | 0.430 | 0.319 | 0.154 | 0.343 |
| Factor7 | 0.030 | 0.091 | 0.114 | 0.061 |
| Factor8 | 0.040 | 0.229 | 0.149 | 0.097 |

**Table 118 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 22**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 1 | | | | |
| Social | 1/3 | 1 | 1/3 | | | | |
| Environmental | 1 | 3 | 1 | | | | |
| Weight | 0.429 | 0.143 | 0.429 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 119 Pairwise comparison matrix: Economic aspect of Respondent 22**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 5 | 3 | 7 | 3 | 1/3 | 1 | 1/3 |
| Factor2 | 1/5 | 1 | 1 | 1 | 1 | 1/7 | 1/3 | 1/5 |
| Factor3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 1/7 | 1/3 | 1/5 |
| Factor4 | 1/7 | 1 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 1 | 3 | 1 | 1 | 1/7 | 1 | 1/3 |
| Factor6 | 3 | 7 | 7 | 7 | 7 | 1 | 5 | 7 |
| Factor7 | 1 | 3 | 3 | 1 | 1 | 1/5 | 1 | 1 |
| Factor8 | 3 | 5 | 5 | 3 | 3 | 1/7 | 1 | 1 |
| Weight | 0.151 | 0.040 | 0.033 | 0.058 | 0.061 | 0.402 | 0.092 | 0.163 |
| Consistency | λmax | 8.773 | CI | 0.110 | RI | 1.41 | CR | 0.08 |

**Table 120 Pairwise comparison matrix: Social aspect of Respondent 22**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 1 |
| Factor3 | 1 | 1/3 | 1 | 3 | 1 | 1 | 1 | 1/5 |
| Factor4 | 1 | 1/3 | 1/3 | 1 | 1 | 1 | 1 | 1/3 |
| Factor5 | 1 | 1 | 1 | 1 | 1 | 5 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 | 1/3 |
| Factor7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 |
| Factor8 | 1 | 1 | 5 | 3 | 1 | 3 | 3 | 1 |
| Weight | 0.116 | 0.152 | 0.102 | 0.081 | 0.151 | 0.086 | 0.099 | 0.214 |
| Consistency | λmax | 8.759 | CI | 0.108 | RI | 1.41 | CR | 0.08 |

**Table 121 Pairwise comparison matrix: Environmental aspect of Respondent 22**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| Factor2 | 1 | 1 | 1 | 5 | 1 | 1 | 5 | 3 |
| Factor3 | 1 | 1 | 1 | 1/3 | 1/3 | 1 | 1 | 1 |
| Factor4 | 1 | 1/5 | 3 | 1 | 1 | 1 | 5 | 1 |
| Factor5 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| Factor7 | 1/3 | 1/5 | 1 | 1/5 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1/3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.126 | 0.211 | 0.095 | 0.142 | 0.135 | 0.126 | 0.064 | 0.099 |
| Consistency | λmax | 8.875 | CI | 0.125 | RI | 1.41 | CR | 0.09 |

**Table 122 Weight of the influential factors of Respondent 22**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.429 | 0.143 | 0.429 | |
| Factor1 | 0.151 | 0.116 | 0.126 | 0.136 |
| Factor2 | 0.040 | 0.152 | 0.211 | 0.130 |
| Factor3 | 0.033 | 0.102 | 0.095 | 0.069 |
| Factor4 | 0.058 | 0.081 | 0.142 | 0.098 |
| Factor5 | 0.061 | 0.151 | 0.135 | 0.106 |
| Factor6 | 0.402 | 0.086 | 0.126 | 0.239 |
| Factor7 | 0.092 | 0.099 | 0.064 | 0.081 |
| Factor8 | 0.163 | 0.214 | 0.099 | 0.143 |

**Table 123 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 23**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 2 | | | | |
| Social | 1 | 1 | 2 | | | | |
| Environmental | 1/2 | 1/2 | 1 | | | | |
| Weight | 0.400 | 0.400 | 0.200 | | | | |
| Consistency | λmax | 3.000 | CI | 0.000 | RI | 0.58 | CR | 0.00 |

**Table 124 Pairwise comparison matrix: Economic aspect of Respondent 23**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1 | 3 | 1 | 1 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 3 | 5 | 1 | 5 | 1 |
| Factor4 | 1 | 1 | 1/3 | 1 | 1 | 1 | 1 | 1 |
| Factor5 | 1/3 | 1/3 | 1/5 | 1 | 1 | 1 | 3 | 1/5 |
| Factor6 | 1 | 1/3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor7 | 1 | 1 | 1/5 | 1 | 1/3 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 |
| Weight | 0.111 | 0.153 | 0.228 | 0.098 | 0.077 | 0.102 | 0.091 | 0.140 |
| Consistency | λmax | 8.941 | CI | 0.134 | RI | 1.41 | CR | 0.10 |

**Table 125 Pairwise comparison matrix: Social aspect of Respondent 23**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1/3 | 1 | 5 | 1/2 | 7 | 1 |
| Factor2 | 1/3 | 1 | 1/3 | 1/2 | 1 | 1/7 | 4 | 1/5 |
| Factor3 | 3 | 3 | 1 | 3 | 2 | 1/5 | 5 | 3 |
| Factor4 | 1 | 2 | 1/3 | 1 | 2 | 1/7 | 3 | 1/3 |
| Factor5 | 1/5 | 1 | 1/2 | 1/2 | 1 | 1/7 | 3 | 1 |
| Factor6 | 2 | 7 | 5 | 7 | 7 | 1 | 6 | 6 |
| Factor7 | 1/7 | 1/4 | 1/5 | 1/3 | 1/3 | 1/6 | 1 | 1/7 |
| Factor8 | 1 | 5 | 1/3 | 3 | 1 | 1/6 | 7 | 1 |
| Weight | 0.136 | 0.049 | 0.169 | 0.072 | 0.054 | 0.376 | 0.025 | 0.120 |
| Consistency | λmax | 8.954 | CI | 0.136 | RI | 1.41 | CR | 0.10 |

**Table 126 Pairwise comparison matrix: Environmental aspect of Respondent 23**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/5 | 3 | 1/3 | 1/3 | 1/7 | 6 | 1/2 |
| Factor2 | 5 | 1 | 3 | 3 | 1 | 1/5 | 5 | 2 |
| Factor3 | 1/3 | 1/3 | 1 | 1/3 | 1/2 | 1/7 | 3 | 1/3 |
| Factor4 | 3 | 1/3 | 3 | 1 | 1/2 | 1/3 | 7 | 2 |
| Factor5 | 3 | 1 | 2 | 2 | 1 | 1/5 | 5 | 2 |
| Factor6 | 7 | 5 | 7 | 3 | 5 | 1 | 5 | 7 |
| Factor7 | 1/6 | 1/5 | 1/3 | 1/7 | 1/5 | 1/5 | 1 | 1/3 |
| Factor8 | 2 | 1/2 | 3 | 1/2 | 1/2 | 1/7 | 3 | 1 |
| Weight | 0.067 | 0.156 | 0.044 | 0.117 | 0.126 | 0.387 | 0.027 | 0.075 |
| Consistency | λmax | 8.919 | CI | 0.131 | RI | 1.41 | CR | 0.09 |

**Table 127 Weight of the influential factors of Respondent 23**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.400 | 0.400 | 0.200 | |
| Factor1 | 0.111 | 0.136 | 0.067 | 0.112 |
| Factor2 | 0.153 | 0.049 | 0.156 | 0.112 |
| Factor3 | 0.228 | 0.169 | 0.044 | 0.167 |
| Factor4 | 0.098 | 0.072 | 0.117 | 0.092 |
| Factor5 | 0.077 | 0.054 | 0.126 | 0.078 |
| Factor6 | 0.102 | 0.376 | 0.387 | 0.268 |
| Factor7 | 0.091 | 0.025 | 0.027 | 0.051 |
| Factor8 | 0.140 | 0.120 | 0.075 | 0.119 |

**Table 128 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 24**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1/3 | 1 | | | | |
| Social | 3 | 1 | 2 | | | | |
| Environmental | 1 | 1/2 | 1 | | | | |
| Weight | 0.211 | 0.548 | 0.241 | | | | |
| Consistency | λmax | 3.018 | CI | 0.009 | RI | 0.58 | CR | 0.02 |

**Table 129 Pairwise comparison matrix: Economic aspect of Respondent 24**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 2 | 5 | 1/5 | 6 | 6 |
| Factor2 | 1 | 1 | 1 | 1/3 | 3 | 1/7 | 2 | 5 |
| Factor3 | 1 | 1 | 1 | 2 | 4 | 1/7 | 7 | 7 |
| Factor4 | 1/2 | 3 | 1/2 | 1 | 2 | 1/7 | 3 | 4 |
| Factor5 | 1/5 | 1/3 | 1/4 | 1/2 | 1 | 1/7 | 1 | 1 |
| Factor6 | 5 | 7 | 7 | 7 | 7 | 1 | 8 | 6 |
| Factor7 | 1/6 | 1/2 | 1/7 | 1/3 | 1 | 1/8 | 1 | 1/3 |
| Factor8 | 1/6 | 1/5 | 1/7 | 1/4 | 1 | 1/6 | 3 | 1 |
| Weight | 0.140 | 0.090 | 0.139 | 0.096 | 0.035 | 0.430 | 0.030 | 0.040 |
| Consistency | λmax | 8.889 | CI | 0.127 | RI | 1.41 | CR | 0.09 |

**Table 130 Pairwise comparison matrix: Social aspect of Respondent 24**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1/3 | 3 | 1/5 | 1 | 1/5 |
| Factor2 | 1 | 1 | 3 | 1/3 | 1 | 1/3 | 1 | 1/5 |
| Factor3 | 1 | 1/3 | 1 | 1/3 | 1/3 | 1/5 | 1/5 | 1/5 |
| Factor4 | 3 | 3 | 3 | 1 | 5 | 1/3 | 3 | 1/3 |
| Factor5 | 1/3 | 1 | 3 | 1/5 | 1 | 1/5 | 3 | 1/5 |
| Factor6 | 5 | 3 | 5 | 3 | 5 | 1 | 5 | 1 |
| Factor7 | 1 | 1 | 5 | 1/3 | 1/3 | 1/5 | 1 | 1/3 |
| Factor8 | 5 | 5 | 5 | 3 | 5 | 1 | 3 | 1 |
| Weight | 0.065 | 0.067 | 0.038 | 0.151 | 0.070 | 0.267 | 0.073 | 0.269 |
| Consistency | λmax | 8.902 | CI | 0.129 | RI | 1.41 | CR | 0.09 |

**Table 131 Pairwise comparison matrix: Environmental aspect of Respondent 24**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 3 | 1 | 3 | 1/5 | 6 | 3 |
| Factor2 | 3 | 1 | 1 | 1 | 1 | 1/5 | 4 | 1 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1/2 | 1/7 | 3 | 1/2 |
| Factor4 | 1 | 1 | 1 | 1 | 2 | 1/3 | 4 | 2 |
| Factor5 | 1/3 | 1 | 2 | 1/2 | 1 | 1/5 | 7 | 2 |
| Factor6 | 5 | 5 | 7 | 3 | 5 | 1 | 6 | 7 |
| Factor7 | 1/6 | 1/4 | 1/3 | 1/4 | 1/7 | 1/6 | 1 | 1/6 |
| Factor8 | 1/3 | 1 | 2 | 1/2 | 1/2 | 1/7 | 6 | 1 |
| Weight | 0.134 | 0.109 | 0.064 | 0.110 | 0.096 | 0.384 | 0.026 | 0.078 |
| Consistency | λmax | 8.913 | CI | 0.130 | RI | 1.41 | CR | 0.09 |

**Table 132 Weight of the influential factors of Respondent 24**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.211 | 0.548 | 0.241 | |
| Factor1 | 0.140 | 0.065 | 0.134 | 0.097 |
| Factor2 | 0.090 | 0.067 | 0.109 | 0.082 |
| Factor3 | 0.139 | 0.038 | 0.064 | 0.065 |
| Factor4 | 0.096 | 0.151 | 0.110 | 0.130 |
| Factor5 | 0.035 | 0.070 | 0.096 | 0.069 |
| Factor6 | 0.430 | 0.267 | 0.384 | 0.330 |
| Factor7 | 0.030 | 0.073 | 0.026 | 0.052 |
| Factor8 | 0.040 | 0.269 | 0.078 | 0.175 |

**Table 133 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 25**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 1 | 3 | | | | | |
| Social | 1 | 1 | 5 | | | | | |
| Environmental | 1/3 | 1/5 | 1 | | | | | |
| Weight | 0.405 | 0.480 | 0.115 | | | | | |
| Consistency | λmax | 3.029 | CI | 0.015 | RI | 0.58 | CR | 0.03 |

**Table 134 Pairwise comparison matrix: Economic aspect of Respondent 25**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1/3 | 3 | 1/6 | 3 | 6 |
| Factor2 | 1 | 1 | 1 | 1 | 5 | 1/5 | 2 | 3 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1/6 | 5 | 5 |
| Factor4 | 3 | 1 | 1 | 1 | 5 | 1/7 | 3 | 5 |
| Factor5 | 1/3 | 1/5 | 1/3 | 1/5 | 1 | 1/7 | 1/2 | 1/3 |
| Factor6 | 6 | 5 | 6 | 7 | 7 | 1 | 6 | 5 |
| Factor7 | 1/3 | 1/2 | 1/5 | 1/3 | 2 | 1/6 | 1 | 1/3 |
| Factor8 | 1/6 | 1/3 | 1/5 | 1/5 | 3 | 1/5 | 3 | 1 |
| Weight | 0.105 | 0.103 | 0.119 | 0.135 | 0.029 | 0.413 | 0.041 | 0.056 |
| Consistency | λmax | 8.972 | CI | 0.139 | RI | 1.41 | CR | 0.10 |

**Table 135 Pairwise comparison matrix: Social aspect of Respondent 25**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 3 | 1 | 1 | 1/7 | 7 | 1 |
| Factor2 | 3 | 1 | 2 | 1 | 2 | 1/7 | 2 | 1 |
| Factor3 | 1/3 | 1/2 | 1 | 1 | 2 | 1/5 | 3 | 3 |
| Factor4 | 1 | 1 | 1 | 1 | 1 | 1/4 | 3 | 2 |
| Factor5 | 1 | 1/2 | 1/2 | 1 | 1 | 1/7 | 5 | 2 |
| Factor6 | 7 | 7 | 5 | 4 | 7 | 1 | 7 | 6 |
| Factor7 | 1/7 | 1/2 | 1/3 | 1/3 | 1/5 | 1/7 | 1 | 1/5 |
| Factor8 | 1 | 1 | 1/3 | 1/2 | 1/2 | 1/6 | 5 | 1 |
| Weight | 0.104 | 0.109 | 0.093 | 0.091 | 0.082 | 0.422 | 0.029 | 0.069 |
| Consistency | λmax | 8.981 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 136 Pairwise comparison matrix: Environmental aspect of Respondent 25**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 4 | 7 | 3 | 4 | 1 | 7 | 1 |
| Factor2 | 1/4 | 1 | 1/2 | 1/2 | 1/2 | 1/9 | 2 | 1/5 |
| Factor3 | 1/7 | 2 | 1 | 1 | 2 | 1/6 | 1 | 1/3 |
| Factor4 | 1/3 | 2 | 1 | 1 | 3 | 1 | 3 | 1/3 |
| Factor5 | 1/4 | 2 | 1/2 | 1/3 | 1 | 1/7 | 5 | 1/2 |
| Factor6 | 1 | 9 | 6 | 1 | 7 | 1 | 4 | 5 |
| Factor7 | 1/7 | 1/2 | 1 | 1/3 | 1/5 | 1/4 | 1 | 1/5 |
| Factor8 | 1 | 5 | 3 | 3 | 2 | 1/5 | 5 | 1 |
| Weight | 0.234 | 0.040 | 0.060 | 0.108 | 0.065 | 0.292 | 0.034 | 0.167 |
| Consistency | λmax | 8.962 | CI | 0.137 | RI | 1.41 | CR | 0.10 |

**Table 137 Weight of the influential factors of Respondent 25**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.405 | 0.480 | 0.115 | |
| Factor1 | 0.105 | 0.104 | 0.234 | 0.120 |
| Factor2 | 0.103 | 0.109 | 0.040 | 0.099 |
| Factor3 | 0.119 | 0.093 | 0.060 | 0.100 |
| Factor4 | 0.135 | 0.091 | 0.108 | 0.111 |
| Factor5 | 0.029 | 0.082 | 0.065 | 0.059 |
| Factor6 | 0.413 | 0.422 | 0.292 | 0.404 |
| Factor7 | 0.041 | 0.029 | 0.034 | 0.034 |
| Factor8 | 0.056 | 0.069 | 0.167 | 0.075 |

**Table 138 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 26**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 2 | 2 | | | | |
| Social | 1/2 | 1 | 2 | | | | |
| Environmental | 1/2 | 1/2 | 1 | | | | |
| Weight | 0.490 | 0.312 | 0.198 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 139 Pairwise comparison matrix: Economic aspect of Respondent 26**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 5 | 5 | 3 | 1 | 3 | 1 |
| Factor2 | 1/3 | 1 | 3 | 1 | 1/3 | 1/5 | 3 | 1/5 |
| Factor3 | 1/5 | 1/3 | 1 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 |
| Factor4 | 1/5 | 1 | 3 | 1 | 1/5 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 3 | 3 | 5 | 1 | 1/3 | 3 | 1/3 |
| Factor6 | 1 | 5 | 3 | 7 | 3 | 1 | 5 | 3 |
| Factor7 | 1/3 | 1/3 | 3 | 1 | 1/3 | 1/5 | 1 | 1/3 |
| Factor8 | 1 | 5 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Weight | 0.209 | 0.071 | 0.039 | 0.053 | 0.121 | 0.274 | 0.056 | 0.177 |
| Consistency | λmax | 8.834 | CI | 0.119 | RI | 1.41 | CR | 0.08 |

**Table 140 Pairwise comparison matrix: Social aspect of Respondent 26**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 3 | 1/4 | 6 | 1/3 |
| Factor2 | 1/3 | 1 | 1 | 1/2 | 1 | 1/5 | 4 | 1/5 |
| Factor3 | 1 | 1 | 1 | 3 | 2 | 1/4 | 5 | 1/2 |
| Factor4 | 1 | 2 | 1/3 | 1 | 2 | 1/3 | 4 | 1 |
| Factor5 | 1/3 | 1 | 1/2 | 1/2 | 1 | 1/7 | 5 | 1/2 |
| Factor6 | 4 | 5 | 4 | 3 | 7 | 1 | 5 | 5 |
| Factor7 | 1/6 | 1/4 | 1/5 | 1/4 | 1/5 | 1/5 | 1 | 1/7 |
| Factor8 | 3 | 5 | 2 | 1 | 2 | 1/5 | 7 | 1 |
| Weight | 0.115 | 0.062 | 0.117 | 0.099 | 0.061 | 0.352 | 0.026 | 0.167 |
| Consistency | λmax | 8.805 | CI | 0.115 | RI | 1.41 | CR | 0.08 |

**Table 141 Pairwise comparison matrix: Environmental aspect of Respondent 26**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 4 | 2 | 1 | 1/5 | 7 | 5 |
| Factor2 | 3 | 1 | 2 | 1 | 1 | 1/5 | 4 | 2 |
| Factor3 | 1/4 | 1/2 | 1 | 1 | 1/2 | 1/7 | 5 | 3 |
| Factor4 | 1/2 | 1 | 1 | 1 | 1 | 1/6 | 7 | 5 |
| Factor5 | 1 | 1 | 2 | 1 | 1 | 1/5 | 7 | 3 |
| Factor6 | 5 | 5 | 7 | 6 | 5 | 1 | 5 | 6 |
| Factor7 | 1/7 | 1/4 | 1/5 | 1/7 | 1/7 | 1/5 | 1 | 1 |
| Factor8 | 1/5 | 1/2 | 1/3 | 1/5 | 1/3 | 1/6 | 1 | 1 |
| Weight | 0.136 | 0.118 | 0.072 | 0.105 | 0.110 | 0.396 | 0.029 | 0.035 |
| Consistency | λmax | 8.936 | CI | 0.134 | RI | 1.41 | CR | 0.09 |

**Table 142 Weight of the influential factors of Respondent 26**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.490 | 0.312 | 0.198 | |
| Factor1 | 0.209 | 0.115 | 0.136 | 0.165 |
| Factor2 | 0.071 | 0.062 | 0.118 | 0.078 |
| Factor3 | 0.039 | 0.117 | 0.072 | 0.070 |
| Factor4 | 0.053 | 0.099 | 0.105 | 0.078 |
| Factor5 | 0.121 | 0.061 | 0.110 | 0.100 |
| Factor6 | 0.274 | 0.352 | 0.396 | 0.322 |
| Factor7 | 0.056 | 0.026 | 0.029 | 0.041 |
| Factor8 | 0.177 | 0.167 | 0.035 | 0.146 |

**Table 143 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 27**

| Criteria | Economic | Social | Environmental | | | | | |
|---|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 2 | | | | | |
| Social | 1/3 | 1 | 1 | | | | | |
| Environmental | 1/2 | 1 | 1 | | | | | |
| Weight | 0.548 | 0.211 | 0.241 | | | | | |
| Consistency | λmax | 3.018 | CI | 0.009 | RI | 0.58 | CR | 0.02 |

**Table 144 Pairwise comparison matrix: Economic aspect of Respondent 27**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 3 | 7 | 3 | 1/3 | 3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/3 | 1/7 | 1 | 1/5 |
| Factor3 | 1/3 | 1 | 1 | 1 | 1/3 | 1/7 | 1/3 | 1/3 |
| Factor4 | 1/7 | 1 | 1 | 1 | 1/5 | 1/7 | 1 | 1/3 |
| Factor5 | 1/3 | 3 | 3 | 5 | 1 | 1/3 | 3 | 1/3 |
| Factor6 | 3 | 7 | 7 | 7 | 3 | 1 | 7 | 3 |
| Factor7 | 1/3 | 1 | 3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 1 | 5 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Weight | 0.163 | 0.055 | 0.042 | 0.041 | 0.119 | 0.354 | 0.057 | 0.168 |
| Consistency | λmax | 8.648 | CI | 0.093 | RI | 1.41 | CR | 0.07 |

**Table 145 Pairwise comparison matrix: Social aspect of Respondent 27**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1 | 1 | 1/3 | 1 | 1/3 |
| Factor2 | 1 | 1 | 3 | 1 | 1/3 | 1/5 | 3 | 1 |
| Factor3 | 3 | 1/3 | 1 | 1 | 1/3 | 1/3 | 3 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/5 | 1/7 | 1 | 1 |
| Factor5 | 1 | 3 | 3 | 5 | 1 | 1/5 | 3 | 1 |
| Factor6 | 3 | 5 | 3 | 7 | 5 | 1 | 7 | 7 |
| Factor7 | 1 | 1/3 | 1/3 | 1 | 1/3 | 1/7 | 1 | 1/3 |
| Factor8 | 3 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Weight | 0.068 | 0.097 | 0.095 | 0.061 | 0.153 | 0.381 | 0.043 | 0.101 |
| Consistency | λmax | 8.942 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 146 Pairwise comparison matrix: Environmental aspect of Respondent 27**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 4 | 1 | 3 | 6 | 1 | 7 | 1/2 |
| Factor2 | 1/4 | 1 | 1/4 | 1/2 | 2 | 1/7 | 3 | 1/5 |
| Factor3 | 1 | 4 | 1 | 2 | 3 | 1/6 | 3 | 1 |
| Factor4 | 1/3 | 2 | 1/2 | 1 | 3 | 1/7 | 3 | 1/2 |
| Factor5 | 1/6 | 1/2 | 1/3 | 1/3 | 1 | 1/8 | 6 | 1/3 |
| Factor6 | 1 | 7 | 6 | 7 | 8 | 1 | 7 | 7 |
| Factor7 | 1/7 | 1/3 | 1/3 | 1/3 | 1/6 | 1/7 | 1 | 1/7 |
| Factor8 | 2 | 5 | 1 | 2 | 3 | 1/7 | 7 | 1 |
| Weight | 0.179 | 0.046 | 0.113 | 0.068 | 0.047 | 0.372 | 0.023 | 0.152 |
| Consistency | λmax | 8.963 | CI | 0.138 | RI | 1.41 | CR | 0.10 |

**Table 147 Weight of the influential factors of Respondent 27**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.548 | 0.211 | 0.241 | |
| Factor1 | 0.163 | 0.068 | 0.179 | 0.147 |
| Factor2 | 0.055 | 0.097 | 0.046 | 0.062 |
| Factor3 | 0.042 | 0.095 | 0.113 | 0.070 |
| Factor4 | 0.041 | 0.061 | 0.068 | 0.052 |
| Factor5 | 0.119 | 0.153 | 0.047 | 0.109 |
| Factor6 | 0.354 | 0.381 | 0.372 | 0.364 |
| Factor7 | 0.057 | 0.043 | 0.023 | 0.046 |
| Factor8 | 0.168 | 0.101 | 0.152 | 0.150 |

**Table 148 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 28**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 3 | 5 | | | | |
| Social | 1/3 | 1 | 3 | | | | |
| Environmental | 1/5 | 1/3 | 1 | | | | |
| Weight | 0.633 | 0.260 | 0.106 | | | | |
| Consistency | λmax | 3.039 | CI | 0.019 | RI | 0.58 | CR | 0.03 |

**Table 149 Pairwise comparison matrix: Economic aspect of Respondent 28**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 1 | 1/5 | 1/5 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/3 | 1/3 | 1 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 1/7 | 1/5 | 1 | 1/3 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1/5 |
| Factor5 | 1 | 3 | 7 | 3 | 1 | 1 | 1 | 3 |
| Factor6 | 5 | 3 | 5 | 5 | 1 | 1 | 1 | 1 |
| Factor7 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 3 | 5 | 1/3 | 1 | 1 | 1 |
| Weight | 0.079 | 0.080 | 0.062 | 0.065 | 0.215 | 0.218 | 0.144 | 0.137 |
| Consistency | λmax | 8.983 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 150 Pairwise comparison matrix: Social aspect of Respondent 28**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 3 | 3 | 3 | 1/3 | 3 | 1/3 |
| Factor2 | 1/3 | 1 | 1 | 3 | 1 | 1/5 | 1 | 1/3 |
| Factor3 | 1/3 | 1 | 1 | 1/3 | 1/5 | 1/7 | 1/3 | 1/3 |
| Factor4 | 1/3 | 1/3 | 3 | 1 | 1/3 | 1/7 | 3 | 1/3 |
| Factor5 | 1/3 | 1 | 5 | 3 | 1 | 1/7 | 3 | 1/3 |
| Factor6 | 3 | 5 | 7 | 7 | 7 | 1 | 5 | 3 |
| Factor7 | 1/3 | 1 | 3 | 1/3 | 1/3 | 1/5 | 1 | 1/3 |
| Factor8 | 3 | 3 | 3 | 3 | 3 | 1/3 | 3 | 1 |
| Weight | 0.138 | 0.067 | 0.038 | 0.064 | 0.097 | 0.360 | 0.055 | 0.181 |
| Consistency | λmax | 8.969 | CI | 0.138 | RI | 1.41 | CR | 0.10 |

**Table 151 Pairwise comparison matrix: Environmental aspect of Respondent 28**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 3 | 1 | 1 | 1 | 1/7 | 1 | 1 |
| Factor2 | 1/3 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1/3 | 1 | 1 |
| Factor4 | 1 | 1 | 1 | 1 | 1/3 | 1/7 | 1 | 1 |
| Factor5 | 1 | 1 | 1/3 | 3 | 1 | 1/7 | 1/3 | 1/3 |
| Factor6 | 7 | 7 | 3 | 7 | 7 | 1 | 5 | 3 |
| Factor7 | 1 | 1/3 | 1 | 1 | 3 | 1/5 | 1 | 1/3 |
| Factor8 | 1 | 1 | 1 | 1 | 3 | 1/3 | 3 | 1 |
| Weight | 0.091 | 0.085 | 0.098 | 0.071 | 0.067 | 0.398 | 0.076 | 0.114 |
| Consistency | λmax | 8.943 | CI | 0.135 | RI | 1.41 | CR | 0.10 |

**Table 152 Weight of the influential factors of Respondent 28**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.633 | 0.260 | 0.106 | |
| Factor1 | 0.079 | 0.138 | 0.091 | 0.096 |
| Factor2 | 0.080 | 0.067 | 0.085 | 0.077 |
| Factor3 | 0.062 | 0.038 | 0.098 | 0.060 |
| Factor4 | 0.065 | 0.064 | 0.071 | 0.065 |
| Factor5 | 0.215 | 0.097 | 0.067 | 0.168 |
| Factor6 | 0.218 | 0.360 | 0.398 | 0.274 |
| Factor7 | 0.144 | 0.055 | 0.076 | 0.114 |
| Factor8 | 0.137 | 0.181 | 0.114 | 0.146 |

**Table 153 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 29**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 1/2 | 1/3 | | | | |
| Social | 2 | 1 | 1 | | | | |
| Environmental | 3 | 1 | 1 | | | | |
| Weight | 0.170 | 0.387 | 0.443 | | | | |
| Consistency | λmax | 3.018 | CI | 0.009 | RI | 0.58 | CR | 0.02 |

**Table 154 Pairwise comparison matrix: Economic aspect of Respondent 29**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/5 | 1/3 | 1/5 | 1 | 1/3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/3 |
| Factor3 | 5 | 1 | 1 | 1 | 1/3 | 1 | 1/3 | 1 |
| Factor4 | 3 | 1 | 1 | 1 | 1 | 3 | 1/3 | 1 |
| Factor5 | 5 | 1 | 3 | 1 | 1 | 5 | 1 | 3 |
| Factor6 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1/5 | 1/3 |
| Factor7 | 3 | 1 | 3 | 3 | 1 | 5 | 1 | 1 |
| Factor8 | 1 | 3 | 1 | 1 | 1/3 | 3 | 1 | 1 |
| Weight | 0.059 | 0.104 | 0.106 | 0.123 | 0.215 | 0.056 | 0.202 | 0.135 |
| Consistency | λmax | 8.890 | CI | 0.127 | RI | 1.41 | CR | 0.09 |

**Table 155 Pairwise comparison matrix: Social aspect of Respondent 29**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/3 | 1/3 | 1/5 | 1 | 1/5 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1/3 | 1 | 1 | 1 |
| Factor3 | 3 | 1 | 1 | 1 | 1/3 | 1 | 1 | 3 |
| Factor4 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 3 |
| Factor5 | 5 | 3 | 3 | 1 | 1 | 5 | 5 | 1 |
| Factor6 | 1 | 1 | 1 | 1/3 | 1/5 | 1 | 1 | 1/3 |
| Factor7 | 5 | 1 | 1 | 1 | 1/5 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1/3 | 1/3 | 1 | 3 | 1 | 1 |
| Weight | 0.057 | 0.094 | 0.128 | 0.163 | 0.268 | 0.069 | 0.115 | 0.105 |
| Consistency | λmax | 8.867 | CI | 0.124 | RI | 1.41 | CR | 0.09 |

**Table 156 Pairwise comparison matrix: Environmental aspect of Respondent 29**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 |
| Factor2 | 1 | 1 | 1 | 3 | 1 | 1 | 7 | 3 |
| Factor3 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| Factor4 | 1 | 1/3 | 1 | 1 | 1 | 1/5 | 5 | 1 |
| Factor5 | 1/3 | 1 | 1/3 | 1 | 1 | 1/5 | 1 | 1 |
| Factor6 | 1 | 1 | 1 | 5 | 5 | 1 | 3 | 1 |
| Factor7 | 1/3 | 1/7 | 1 | 1/5 | 1 | 1/3 | 1 | 1 |
| Factor8 | 1 | 1/3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Weight | 0.142 | 0.193 | 0.130 | 0.106 | 0.073 | 0.195 | 0.062 | 0.100 |
| Consistency | λmax | 8.981 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 157 Weight of the influential factors of Respondent 29**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.170 | 0.387 | 0.443 | |
| Factor1 | 0.059 | 0.057 | 0.142 | 0.095 |
| Factor2 | 0.104 | 0.094 | 0.193 | 0.139 |
| Factor3 | 0.106 | 0.128 | 0.130 | 0.125 |
| Factor4 | 0.123 | 0.163 | 0.106 | 0.131 |
| Factor5 | 0.215 | 0.268 | 0.073 | 0.173 |
| Factor6 | 0.056 | 0.069 | 0.195 | 0.122 |
| Factor7 | 0.202 | 0.115 | 0.062 | 0.106 |
| Factor8 | 0.135 | 0.105 | 0.100 | 0.108 |

**Table 158 Pairwise comparison matrix: Sustainable goal's Criteria of Respondent 30**

| Criteria | Economic | Social | Environmental | | | | |
|---|---|---|---|---|---|---|---|
| Economic | 1 | 2 | 2 | | | | |
| Social | 1/2 | 1 | 1/2 | | | | |
| Environmental | 1/2 | 2 | 1 | | | | |
| Weight | 0.490 | 0.198 | 0.312 | | | | |
| Consistency | λmax | 3.054 | CI | 0.027 | RI | 0.58 | CR | 0.05 |

**Table 159 Pairwise comparison matrix: Economic aspect of Respondent 30**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1/3 | 4 | 3 | 2 | 1/7 | 6 | 1/2 |
| Factor2 | 3 | 1 | 1 | 2 | 2 | 1/7 | 3 | 2 |
| Factor3 | 1/4 | 1 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor4 | 1/3 | 1/2 | 1 | 1 | 1 | 1/4 | 4 | 1/3 |
| Factor5 | 1/2 | 1/2 | 1 | 1 | 1 | 1/7 | 3 | 1 |
| Factor6 | 7 | 7 | 7 | 4 | 7 | 1 | 7 | 7 |
| Factor7 | 1/6 | 1/3 | 1/3 | 1/4 | 1/3 | 1/7 | 1 | 1/7 |
| Factor8 | 2 | 1/2 | 1 | 3 | 1 | 1/7 | 7 | 1 |
| Weight | 0.119 | 0.117 | 0.067 | 0.065 | 0.063 | 0.436 | 0.026 | 0.107 |
| Consistency | λmax | 8.959 | CI | 0.137 | RI | 1.41 | CR | 0.10 |

**Table 160 Pairwise comparison matrix: Social aspect of Respondent 30**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 1 | 1/5 | 1 | 1/3 | 1/3 | 1/3 | 1 |
| Factor2 | 1 | 1 | 1 | 1 | 1 | 1/3 | 1/3 | 1 |
| Factor3 | 5 | 1 | 1 | 3 | 3 | 1 | 1 | 1 |
| Factor4 | 1 | 1 | 1/3 | 1 | 1 | 1/5 | 1 | 1 |
| Factor5 | 3 | 1 | 1/3 | 1 | 1 | 1 | 3 | 1 |
| Factor6 | 3 | 3 | 1 | 5 | 1 | 1 | 1 | 5 |
| Factor7 | 3 | 3 | 1 | 1 | 1/3 | 1 | 1 | 1 |
| Factor8 | 1 | 1 | 1 | 1 | 1 | 1/5 | 1 | 1 |
| Weight | 0.059 | 0.085 | 0.186 | 0.078 | 0.140 | 0.224 | 0.137 | 0.092 |
| Consistency | λmax | 8.898 | CI | 0.128 | RI | 1.41 | CR | 0.09 |

**Table 161 Pairwise comparison matrix: Environmental aspect of Respondent 30**

| Alternatives | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 | Factor7 | Factor8 |
|---|---|---|---|---|---|---|---|---|
| Factor1 | 1 | 2 | 2 | 2 | 1/3 | 1/7 | 1/3 | 1/3 |
| Factor2 | 1/2 | 1 | 3 | 3 | 1/2 | 1/7 | 1 | 1 |
| Factor3 | 1/2 | 1/3 | 1 | 1 | 1/3 | 1/7 | 1/2 | 1/2 |
| Factor4 | 1/2 | 1/3 | 1 | 1 | 1/5 | 1/5 | 1 | 1 |
| Factor5 | 3 | 2 | 3 | 5 | 1 | 1/5 | 1/2 | 1 |
| Factor6 | 7 | 7 | 7 | 5 | 5 | 1 | 7 | 6 |
| Factor7 | 3 | 1 | 2 | 1 | 2 | 1/7 | 1 | 1/3 |
| Factor8 | 3 | 1 | 2 | 1 | 1 | 1/6 | 3 | 1 |
| Weight | 0.068 | 0.084 | 0.041 | 0.053 | 0.127 | 0.428 | 0.092 | 0.106 |
| Consistency | λmax | 8.977 | CI | 0.140 | RI | 1.41 | CR | 0.10 |

**Table 162 Weight of the influential factors of Respondent 30**

| Alternatives/Criteria | Economic aspect | Social aspect | Environmental aspect | Summary weight |
|---|---|---|---|---|
| Weight: | 0.490 | 0.198 | 0.312 | |
| Factor1 | 0.119 | 0.059 | 0.068 | 0.091 |
| Factor2 | 0.117 | 0.085 | 0.084 | 0.100 |
| Factor3 | 0.067 | 0.186 | 0.041 | 0.082 |
| Factor4 | 0.065 | 0.078 | 0.053 | 0.064 |
| Factor5 | 0.063 | 0.140 | 0.127 | 0.098 |
| Factor6 | 0.436 | 0.224 | 0.428 | 0.392 |
| Factor7 | 0.026 | 0.137 | 0.092 | 0.069 |
| Factor8 | 0.107 | 0.092 | 0.106 | 0.104 |