CHAPTER 4
INHERENT UNDERSTANDINGS AND PERCEPTIONS OF SUSTAINABLE ENGINEERING PRACTICES IN REVITALIZATION OF INFRASTRUCTURE IN THE HOSPITALITY SECTOR

In the previous chapter, the study presented the research methodology and showed how it aims at gathering and analysing data that responds to the research questions. Before the initial analysis of data collected, the study presents this fourth chapter, which aims at understanding the phenomenon to which a framework will be built upon. This chapter therefore looks at understanding and perception of sustainable engineering practices in revitalization of Infrastructure in the hospitality sector. The chapter specifically presents body of knowledge that is in line with the adoption of sustainable engineering practices in revitalising infrastructure in the hospitality sector.

The participants were selected based on their experience and qualification in the phenomenon of revitalizing infrastructure. This was key in making sure the data gathered was accurate and rich because of their knowledge, expertise, and tenure in the field. Majority of the participants were structural engineers, and it was made sure that the respondents' identity was kept anonymous. The demographic details of the respondents are provided in Table 4.1 below.

Table 4.1: Demographics *(Primary data, 2024)*

ID	Participant's position	Years of industrial experience	Years of engineering experience	Type of interview
R1	Structural engineer	<5 years	<5 years	Face to face
R2	Structural engineer	6-10 years	6-10 years	Face to face
R3	Electrical engineer	6-10 years	<5 years	Face to face
R4	Structural engineer	< 5 years	<5 years	Face to face
R5	Civil engineer	11-15 years	6-10 years	Face to face
R6	Electrical engineer	11-15years	6-10 years	Face to face
R7	Civil engineer	6-10 years	< 5 years	Face to face
R8	Electrical engineer	>21 years	6-10 years	Face to face
R9	Structural engineer	<5 years	< 5 years	Face to face
R10	Electrical engineer	11-15 years	6-10 years	Face to face
R11	Civil engineer	16-20 years	6-10 years	Face to face
R12	Civil engineer	16-20 years	<5 years	Face to face
R13	Electrical engineer	11-15 years	6-10 years	Face to face
R14	Structural engineer	16-20 years	6-10 years	Face to face
R15	Structural engineer	>21 years	6-10 years	Face to face
R16	Electrical engineer	6-10 years	< 5 years	Face to face

R17	Civil engineer	11-15 years	6-10 years	Face to face
R18	Structural engineer	6-10 years	<5 years	Face to face
R19	Structural engineer	11-15 years	<5 years	Face to face
R20	Electrical engineer	< 5 years	< 5 years	Face to face
R21	Structural engineer	<5 years	<5 years	Face to face
R22	Structural engineer	11-15 years	6-10 years	Face to face
R23	Electrical engineer	6-10 years	< 5 years	Face to face
R24	Civil engineer	6-10 years	<5 years	Face to face
R25	Civil engineer	<5 years	<5 years	Face to face
R26	Structural engineer	11-15 years	6-10 years	Face to face
R27	Electrical engineer	16-20 years	6-10 years	Face to face
R28	Civil engineer	16-20 years	6-10 years	Face to face
R29	Electrical engineer	<5 years	< 5 years	Face to face
R30	Structural engineer	11-15 years	< 5 years	Face to face

The above results in Table 4.1 showed the demographic characteristics of the respondents who are staff members at Hwange Safari Lodge. Results showed that majority of the respondents were structural engineers. These were followed by electrical engineers and civil engineers in the organization who were all responsible for revitalising infrastructure hands on.

The results also showed that majority of the respondents have had a working experience of over 5 years in the industry and the firm, majority of the respondents had been working for a period less than 5 years and it translates to short term tenure. A short-term tenure is associated with innovation and risk taking but it is also associated with less knowledge and experience (Kuratko, 2020).

This section of the study is presenting the findings, which were extracted in line with the topics related to the research questions. The respondents were specifically asked to express their views pertaining the phenomenon understudy through responding to the research questions.

It was believed in the study that it is of great significance to first have an insight on the sustainable engineering practices that can be adopted in the organisation to revitalize infrastructure. That is at the beginning of the interview's session, the questions that were designed in the study were designed to allow the respondents describe the engineering practices that are deemed to be sustainable and can enhance the improvement of the quality of infrastructure used by the organization. This was also key in determining their understanding on the phenomenon of sustainable engineering practices.

The interviews showed that the respondents had different views on the sustainable engineering practices that could be adopted in the organisation. Some of the

participants believed that the only sustainable practice is the renovating of infrastructure on short regular intervals and did not have vast knowledge on other practices such as green practices that are environmentally friendly and the adoption of advanced technologies. One of the participants said:

> *"I think the only sustainable engineering practice at our disposal is to regularly check for irregularities in the infrastructure such as cracks and make quick amends before they get worse"- R1.*

Below is a Table 4.2 shows a list of the relevant sustainable engineering practices that were mentioned by the respondents that could be adopted in the organisation. The list of relevant practices includes regular renovations, technology adoption and adoption of environmentally friendly equipment.

Table 4.2 Summary of sustainable practices (*Primary, 2024)*

Practice	Mentioned by Interviewees
Regular checks and fixing	Saves costs (R1, R3, R6, R26, 28), keeps infrastructure intact (R2, R12, R13, R14, R21)
Technology adoption	Saves costs (R1, R4, R5, R8), improves standards (R7, R9, R10, R15, R29, R30)
Environmentally friendly equipment	(R4, R16, R17, R8, R19, R20, R22, R25)

The interviews revealed that the adoption of regular check and fixing of problems on the infrastructure is the major sustainable engineering practices and it helps to save costs. By regularly checking for discrepancies, the problem is quickly determined when it is still small, and it will not be expensive to solve (Law, 2020). In that manner, the interviews postulated that when a problem is left to grow, it is expensive to fix hence regular checks helps to fix it whilst it is cheap, and it saves costs. Interviewee 3 was recorded saying;

> *"Well, I always believe that we should always check on our infrastructure on a monthly basis so that we determine engineering problems as they arise. The earlier we do so, the cheaper it becomes to fix, and it also helps to make sure the infrastructure remains strong"-R3.*

This was evidence that the regular checks do not just lead to determining and fixing a problem in no time before it grows but also helps to save costs for the firm. Regarding that, one electrical engineer points out that;

> *"Replacing electricals in the building is cheaper when it is done without any problem occurring. It only takes a proactive approach to know some cables and assets are overdue and need to be replaced before they cause problems to the entire building"- R6.*

Despite the relevance of cost-cutting or saving costs, another dimension that emerged was that regular checks and fixing are key in ensuring that the infrastructure remains intact of the foreseeable future. Several participants agreed that by regularly checking and fixing emerging complications, the infrastructure

will not be left to deteriorate or experience a fall in standards which entails sustainability. The respondents said the following;

> *"It is essential to make sure that the hotel building does not lose colour or have cracks on it. This can only be done through proactive approaches to determine and fix problems before they grow"-R2.*
> *"Regular fixing of emanating problems on the infrastructure help to make sure that that standard is maintained for the foreseeable future,"- R12.*
> *"Sustainability is derived only from ensuring that we regularly check for areas that need attention and fix the problems before they grow or become any worse. Through that, we make sure the building maintains its standard and attracts more customers"-R13.*
> *"It should always be done on a monthly basis, we check for changes on the infrastructure and come up with measures to fix the problem when they are still small to ensure longevity."-R14.*

On the other hand, there were also a bunch of respondents who pointed out that technology adoption is a key sustainable engineering practices that can be adopted in the organization. Technology is key in several ways in the engineering domain as it helps to detect problems and to fix them at a faster and low-cost manner (Gould, 2021). The use of advanced technological tools and assets helps to detect an engineering problem on the infrastructure for instance electrical engineers to detect quickly electrical challenges in the infrastructure and fix it with no time. One electrical engineer was quoted saying;

> *"Most electrical faults are hard to determine physically and takes time which may further make the fault worsen if not solved quickly. Therefore, adoption of technology in the practice will always help us to determine the electrical faults earlier to ensure sustainability in the business."-R14.*

In support of that, other respondents also pointed out that technology adoption is a key engineering practice that helps to ensure a quick solving of the engineering problems faced efficiently and effectively. Technology adoption ensures that engineering work is done with speed hence saving time and ensuring efficiency and saving costs (R1, R4, R5, R15). In specific, one structural engineer said;

> *"The adoption of technology in refurbishment of the infrastructure is key in putting in place advanced designs through the use of CAD "-R15*

Another point that emerged from the interviews was the adoption of environmentally friendly engineering practices that does not lead to pollution or over exploitation of natural resources. The respondents pointed out that they are now aware of the existence of green and environmentally friendly engineering practices hence can be undertaken for the foreseeable future. According to Muriel (2022), green practices that do not lead in over exploitation of natural resources are key engineering practices that are sustainable and can be adopted for the foreseeable future efficiently. In that context, some of the respondents said;

"There has been the adoption of green engineering practices in countries such as Sweden and these are environmentally friendly, they ensure preservation of natural resources and helps to make sure we have enough for the future"-R14.
"Green engineering practices entails forgoing the use of equipment and fossil fuels that pollutes the environment. It involves the use of assets such as solar systems that are environmentally friendly and helps to enhance sustainability"-R17.

Therefore, the above analysis showed that the respondents point out that 3 major sustainable engineering practices can be adopted in the organisation to revitalise the infrastructure. These includes continuous checking and fixing of problems as they arise, the adoption of technology and environmentally friendly equipment.
The contribution of sustainable engineering practices in enhancing infrastructure sustainability.

The study by attaining the general idea of contribution of sustainable engineering practices in enhancing infrastructure sustainability was key in determining the impression of the respondents on the eagerness to adopt sustainable engineering practices. Figure 4.1 below shows the views of the respondents regarding contribution of sustainable engineering practices.

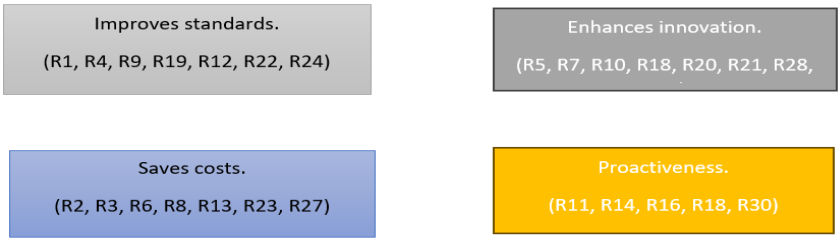

Figure 4.1: Contribution of sustainable engineering practices *(Primary data, 2024).*

Based on these above benefits, participant's understanding pertaining the benefits of sustainable engineering practices was in line with the view of Gordon (2021) who posits that sustainable engineering practices comes with a various benefit that leads to sustainability and development of infrastructure such as saving costs, fostering innovation and future orientation. In the interviews, the first point that was raised was that sustainable engineering practices helps to continuously improve standards of the infrastructure (R1, R4, R9, R19, R12). The first respondent, a structural engineer in the organisation points out that through sustainable engineering practices such as technology adoption, the standard of the infrastructure continues to improve, and it helps to compete at international level.

"Through engineering practices, we are able to look out for new ways to improve the outlook of the infrastructure and it helps to improve the standards of the infrastructure as well as the services provided in the hotel"-R1.

From the above view, other respondents pointed out that standards can be improved by sustainable engineering practices through the development of new advanced designs or technologies that can be instilled on the infrastructure. Some of the respondents said;

> *"The adoption of technology in revitalizing hotel infrastructure is key in instilling advanced technologies that helps to improve the standards of the hotel such as automated doors"-R4.*
> *"There is need to modernise the infrastructure to meet international standards and this can be enhanced by continuously adopting technology and green engineering practices in revitalizing the hotel infrastructure"-R19.*

That point was also closely related to the good view of other group of respondents who pointed out that sustainable engineering practices are the mother of all innovation in revitalizing hotel infrastructure (R5, R7, R10, R18 and R20). The respondents were in line with the earlier view of Morris (2021) who alludes that through continuously checking for areas to improve on the infrastructure helps to come up with new advanced ideas that helps to improve the overall performance of the hotel. A civil engineer in the organization said something interesting;

> *"Innovation enhances continuous improvement of infrastructure, and it should be enhanced by everyone starting with us engineers. Through sustainable practices such as continuously looking for areas to improve, triggers innovation in a bit to improve determined aspects and the infrastructure continues to improve"-R5.*

In that matter, another key point that emerged was that innovation was enhanced through the adoption of sustainable engineering practices such as technology adoption. In most literature, innovation and technology are used interchangeably (Casillas, 2018; Morris, 2018; Kuratko, 2020). Hence, as a result, adopting sustainable engineering practices in form of technology adoption is important in enhancing innovation that helps to improve the standards of the hotel's infrastructure.

> *"Technology adoption translates to innovation or enhances innovation at ease, and it helps to improve the longevity of the infrastructure"-R10.*
> *"Innovation and technology adoption works hand in hand and the adoption of the former in engineering activities such as checking designing new ways to improve the infrastructure leads to developing new ways that improves the stature and appeal of the infrastructure"-R18.*

The aspect of saving costs was also strongly mentioned by the respondents as they allude that the adoption of sustainable engineering practices. Through continuous checking and fixing of faults on the infrastructure before they get worse off, makes it cheaper for the organisation who can then use extra funds available to invest in other aspects that improves the infrastructure such as purchasing new technologies (Becker, 2021). According to one structural engineer in the organisation;

"The fact that sustainable engineering practices ensure that challenges are solved before they get off saves costs. You do not have to act with desperation to improve the infrastructure when you are desperate which is costly as new problems start to emerge too."-R2.

It was also supported by other respondents that agreed that saving costs through sustainable engineering practices is helpful to make sure the firm has extra funds to invest in other pressing matters.

"The engineering practices that save costs are essential in the overall development of infrastructure. They help the business to have more funds to invest in technology and environmentally friendly equipment"-R6.

"Saving costs that come from fixing larger problems is important in ensuring we have more funds to purchase new technologies key in improving the buildings"-R8.

Therefore, the above analysis showed the great benefit that comes from adopting sustainable engineering practices to the infrastructure. The costs saved are key in making sure the business can fund other important factors that helps to achieve the same goal of revitalising the infrastructure.

Another key contribution that emerged was the ability to be proactive hence making sure that the infrastructure is developed in a manner that meets international standards. Through practices such as technology adoption which allows research and development (R&D), the engineers can come up with new ways and aspects to adopt or instill on the building that meets international standards (R11, R14, R16, R18). According to a civil engineer in the organization;

"The major factor is that sustainable engineering practices are future oriented hence they help the organization to always be on the lookout of new and advanced aspects to add on to the infrastructure to meet international standards"-R11.

In that manner, being proactive was also determined as a major factor that leads to continuous improvement on the infrastructure at the hotel driven by sustainable practices such as technology adoption. Adoption of technology as well as continuous checking and fixing faults is a proactive way that helps to make sure the infrastructure is always being developed and improved to match expected standards (Coleman, 2021). Some of the respondents were recorded saying;

"Technology adoption is key in doing researches on the new advanced aspects that can put infrastructure to meet advanced standards of the hotel as a whole in all aspects"-R14.

"Future orientation is enhanced by adoption of technology which allows us to research on the new aspects that are in international hotel infrastructure and try to adopt them here "-R16.

With that, it was noted that indeed adoption of sustainable engineering practices help to ensure sustainability of infrastructure. Through practices such as

technological adoption and green equipment, innovations emerge, costs are reduced, and standards are improved continuously which leads to sustainability.
The potential of sustainable engineering practices in facilitating the redevelopment of infrastructure in the hospitality sector.

After determining the contribution of sustainable engineering practices on enhancing sustainability of the hotel infrastructure, the respondents were asked to show their view regarding the potential of sustainable engineering practices in facilitating the redevelopment of infrastructure. This question was specific to Hwange Safari Lodge considering all its resources including human resources, the space or location of the hotel, available technologies, and finances. The extracted remarks that emerged from the interviews in that regards were presented first in Table 4.3.

Table 4.3: Potential of sustainable engineering practices in facilitating redevelopment of infrastructure *(Primary data, 2024)*

Engineering practice	Mentioned by respondents
Technology advancement	Innovation & benchmarking (R1 R2, R5, R6, R12, R18, R21, R27, R29)
Continuous checking and fixing	Continuous improvement & proactiveness (R3, R7, R10, R11, R13, R20, R23, R25, R30)
Green equipment; technology advancement	Enhance international standards (R4, R8, R13, R14, R16, R17, R19, R22, R26)

The respondents provided an insight on how the mentioned sustainable practices of engineering have a potential or influence redevelopment of infrastructure at Hwange Safari Lodge. It was pointed out that each of the sustainable practices has a potential of enhancing redevelopment of infrastructure through various ways as per the resources that the company have. Coming up with new ideas to implement on the infrastructure such as designs possess a great potential of redeveloping infrastructure everywhere around the globe (Martinez, 2023).

In that regard, various respondents from Hwange Safari Lodge allude that adoption of advanced technology in engineering has a greater potential of enhancing innovation through R&D and benchmarking. Some of the respondents said the following;

> *"I believe if we make it a culture to adopt advanced technology in engineering here at the Safari Lodge, we will achieve greater staff in redeveloping the infrastructure. We will*

have the more access to information pertaining development in other hotel infrastructure across the world and benchmark with them"-R1.
"The adoption of advanced technology in engineering has potential to enhance redevelopment of infrastructure through innovation. I think technology will be key in R&D and in making sure we refurbish the hotel with advanced tools that does an excellent job compared to human hands"-R5.
"We could benefit more from advanced technology adoption due to its known advantages across the globe of enhancing ease infrastructure redevelopment. It all comes through innovation and benchmarking"-R6.

Further, the respondents also showed the potential of engineering practices to ensure redevelopment of infrastructure through continuous improvement (R3, R7, R10, R11, R13, 20). In that essence, the major point that emerged was that through practices such as continuous checking and fixing, there is continuous improvement and having a future orientation on the infrastructure that leads to redevelopment. Some of the respondents were recorded saying the following;

"I also strongly believe that through continuous checking of faults and fixing them can lead to continuous improvement on the infrastructure sustainably. We can come up with future plans on how best the problems can be solved now and forever at the same time ensuring improvements on the building both the interior and outside"-R3.
"I think that also being able to continuously fix small problems as they emerge helps can help in the redevelopment of infrastructure. This is because we can also look into the future and see how best the problems can be fixed and develop new aspects that can help in redeveloping hotel infrastructure"-R10.

Therefore, the above analysis also showed that through continuous checking and fixing faults and problems on the building, there is greater potential of redeveloping infrastructure. It can be noted that the engineering practice helps also to be future oriented hence coming up with plans that helps to improve the overall outlook or appearance of the hotel.

The other aspect that emerged was that the adoption of technology and green equipment also helps to enhance redevelopment of infrastructure through meeting international standards (R4, R8, R13, R14, R16, R17, R19). The two engineering practices when merged, allows the Safari Lodge to be able to apply methods that are being applied in the first world countries hence improving their own standards in the redevelopment and refurbishment of the hotel infrastructure. In that regard, one structural engineer pointed out that;

"The adoption of green equipment is now in overdrive in countries such as Sweden and the United States of America. If we adopt the same and encompass advanced technologies, we have a greater chance of achieving big goals regarding redevelopment of the infrastructure"-R19.

With that being said, it also emerged that the adoption of green equipment and technology saves costs hence the hotel can have enough funds to also invest in

more equipment and hire more staff to ensure the hotel infrastructure is revitalised efficiently and effectively. Below are some of the respondents' remarks;

> *"Using green equipment and technology is a cheaper way of doing activities in the organization. It will leave us with enough or extra cash to invest in other aspects such as manpower development which is also important in redeveloping the infrastructure"-R8.*
> *"We can enhance redevelopment at ease through the use of green equipment and technology. It helps to save costs and also hire more employees with expected skills to ensure the infrastructure is improved"-R14.*

Therefore, the above results also showed that redevelopment of the hotel infrastructure can be enhanced through the adoption of technology and green equipment. The two aspects helps to save costs and help the organisation to invest in other aspects such as developing workforce or hiring more workforce in the revitalisation of the hotel. Above all, the results showed that adopting sustainable engineering practices has a greater potential of enhancing the redevelopment of hotel infrastructure at Hwange Safari lodge.

Therefore, the results shown above led to the creation of the framework for the adoption of sustainable engineering practices in the hospitality sector. The framework was however subject to review by the experts in the study to either confirm or deny its relevance to the hospitality sector regarding the points or factors picked in the interviews. The framework is diagrammatically shown below in Figure 4.2.

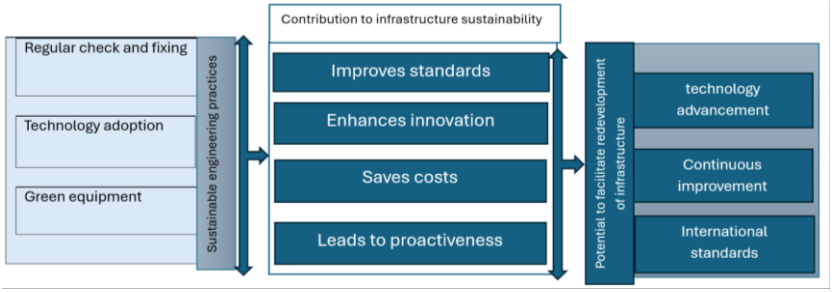

Figure 4.2: *Framework for sustainable engineering practices in the hospitality sector.*

This chapter of the study helped to build an understanding on the phenomenon to which a framework was built. This chapter therefore provided an insight of the respondents at Hwange Safari Lodge on their understanding and perception on sustainable engineering practices in revitalization of Infrastructure in the hospitality sector. The chapter specifically presented a body of knowledge that is in line with the adoption of sustainable engineering practices in revitalising

infrastructure in the hospitality sector. The interviews showed various opinions of the respondents which through answering the research questions. The findings in this chapter were deemed not enough to build the framework of sustainable engineering practices hence motivating the study to carry out a Delphi study with experts in the industry and the field of engineering which was undertaken in the next chapter of the study.