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A Structural Analysis of Barriers Being Faced by Green Banking Initiatives in Pakistan

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Abstract

The aim of this study is to investigate the barriers to green banking in Pakistan. For this purpose, the research is conducted within the panel of 15 experts. It is a qualitative research, with philosophy of interpretivism and it is an exploratory study. For analysis purpose, ISM and MICMAC are used in this study. It consists of literature discourse, collection of data and analysis. This study is conducted after identification and verification of the barriers to green banking in Pakistan. for the purpose of data collection, a panel of experts have been selected. The data have been collected on a matrix type questionnaire from different stakeholders of green banking. Interpretive structural modeling (ISM) and MICMAC are used for structural analysis. Thirty barriers of green banking in Pakistan have been identified from literature, out of which 27 factors are verified by the experts. The results revel that "lack of internal capacity" is the key barrier as it is present at the last level of structural model. "Lack of technology" and "lack of formal guidelines" are also considered as crucial barriers as they are present at the bottom of the model. Thirteen barriers are at the center levels and considered as moderately severe while eleven barriers are at top level that means they have a less severe effect. The results of MICMAC also go along the results of ISM. It is an original attempt to provide a detail view on barriers of green banking that can help government, regulators, society, policy makers and academia. This study will have a great implication for its stakeholders such as banks, regulators, customers etc. It will have theoretical as well as practical implications.

Keywords: Green Banking, Barriers, ISM, MICMAC, Pakistan, Structural Analysis

1. Introduction

In today's world, environment is currently facing a lot of problems that are actually the result of human activities whether in context of organizations or as a society. Green practices in every sector is becoming more common now-a-days in world (Ali et al., 2022; Audi & Ali, 2023). Countries are taking different steps to opt green practices now even in banking sector. From past few years Pakistan is also trying to introduce proper green banking services. But the hurdles to green banking are not becoming less till now. It is evident that there are more than 13000 bank branches that are currently operating in Pakistan and if these are not contributing to clean energy, then they will be considered the major contributors to climate change and also disrupt the local environment because of their huge consumption of non-renewable energy sources (Sharma & Choubey, 2022).

The banking industry in Pakistan is growing significantly because of the rapidly growing population and the good potential for economic growth. According to the recent statistics, there are thirty-four commercial banks currently operating in Pakistan, out of which only five are in the public sector, twenty are in the domestic private sector and the rest of these are foreign and specialized banks. Previously, the banking sector has contributed significantly to the economy of Pakistan and a lot of potential is present in terms of future growth of the banking sector (Bukhari, Hashim, & Amran, 2020). The narrative of green banking is growing rapidly in the world and Pakistan is one of the countries in which there are a lot of barriers regardless of the potential for growth. Green banking corresponds to transactional green energy as well as the development of policies that do not contribute to global climate change. Green banking exists to encourage the banking industry as a whole to focus less on probability and more on transitioning to clean energy in order to reduce its environmental impact (Bukhari, Hashim, Amran, et al., 2020).

In Pakistan, it is very difficult to adopt green banking because of the complexities that exist in the assessment of the green banking projects and also the lack of well-trained staff that is needed to support the green credits. Similarly, the recent statistics also show that there is fragile legal framework implemented in the banking sector by the government of Pakistan before, which has resulted in further increasing the cost of transition to clean energy and also the high risk that exists in such projects (Khairunnessa et al., 2021; Khan et al., 2022). Insufficient awareness of consumers also contributes to creating barriers in the implementation of green banking in Pakistan. Further, internal regulations are weak in all banks that could possibly promote green banking (Tu & Dung, 2017). Green banking has attained attention of researchers over the period of time but hardly any study addressed the barriers of implementing green banking. It is important to identify the barriers. So, this study helps to identify barriers in order to contribute in literature as well as for society, regulators and government. Implementation of green banking

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practices in Pakistan is still in developing phase due to some barriers including lack of awareness, lack of training etc. that need to be identified and addressed. Research objectives of this study are: (1) To find out the barriers in adoption of green banking practices in Pakistan (2) To explicate the underline structure of the barriers (3) To point out the key barriers (4) To classify the barriers on the basis of driving - dependence power (5) To formulate policy guidelines for regulators or bankers to address these barriers timely**.** The research questions that arise from the above research objectives are: (1) What are the barriers to green banking in Pakistan? (2) How these barriers are related to each other? (3) What is the underline structure of these barriers? (4) What are the key barriers to green banking?
In next chapter, previous studies would be reviewed to analyze the different aspects which has been discussed by the scholars. In 3rd chapter, method for research would be discussed followed by the overall sketch. Detailed analysis based on ISM would be a part of chapter 4 while implications related to this research would also be discussed. In last chapter, discussion related to whole analysis will be included and conclusions would be discussed which has been drawn on the basis of analysis.

2. Literature Review

This study is conducted to identify and analyse the barriers to green banking in Pakistan as analyzing these barriers will help the country to overcome these barriers and adopt green banking practices successfully. More than 100 research papers are studied by the researcher for the better and clear understanding of previous studies. The green banking narrative began as a significant surprise because green banking aims to revolutionize the overall banking sector so that it can better contribute to increasing the negative effects of climate change. Recognizing the fact that review of contemporary literature is important to set the context of every new study, a preliminary literature review has also been conducted to identify the issue in hand and to find justification of the study. For this purpose, this study will explore literature from authoritative websites like Google Scholar, Science Direct, Jstor, Wiley online, Taylor and Francis etc.
Bukhari, Hashim & Amran (2020) discussed the need of the green banking along with the challenges in its adoption faced by the banking industry. Pakistan is one of the developing countries which has faced adverse consequences of negative and uncontrolled environmental changes over the years. This research has adopted case study methodology and discuss the whole journey of green banking entry, challenges which it has faced, consequences of not adopting the green banking and current status of this project. This study concluded with recommendations of developing "SMART Green Banking objectives" and inclusion of major stakeholders in the policy making.
Murthy (2019) described the trends which green banking has followed over the years and the current challenges of its adoption in India. This research has used survey based analysis to find out the effect of green banking which it can cause on the current scenario. This study has recommended that training of employees and awareness sessions can cause a positive impact for the implementation of green movement in banking system. Bukhari, Hashim & Amran, (2019) argued that the determinants which can create a positive force for the implementation of the green banking by utilizing "Institutional Theory". This study specifically focused on the external environment and its forces which can create a room for the organization to think about change in current policies of organization. This research only based on theoretical evidence so, there is a room for expanding this research to gather some empirical evidence.
Kalvanai (2021) conducted a study to analyse the application of marketing intelligence that play a critical role in purchase decision of the customers while considering the green banking and geographical indication (Kalyani, 2021). The quantitative method was used by author to collect the data and use it to find out the results through structural equation modelling and statistical analysis. According to the future recommendations given by author it is necessary to apply the concept of geographical indication on the sales of handlooms in India. Further research is recommended in order to explore the relationship with green banking. However, the potential of green banking is proven by the study as it can solve a range of problems in customer's decision making when integrated between the banks and businesses.
Qi et al. (2021) conducted a study on evaluating the implementation of green credit system in Chinese markets. Because of the increasing importance of the green banking system authors analyse the ways that can be adaptable in Chinese banks to promote the sustainable growth of businesses. The quantitative study design was adopted by the authors and 240 valid responses from the relevant people of banking industry were included for statistical analysis (Qi et al., 2021). According to the future recommendations given by authors it is important to overcome the barriers of the banking industry in china in which green credit system is not effective. The decision making process need further research that leads any bank to adopt the green banking system.
Ashiq & Shahir (2020) conducted a research with an objective of finding the key challenges that are creating problems for the green banking system to be implemented in Bangladesh. With growing economy Bangladesh needs effective implementation of green banking system due to which the authors have taken the qualitative methodology

to find out as much data as possible from the relevant experts of banking industry. Interviews were conducted by the researchers and they found significant challenges and deficiencies in the banking system of Bangladesh (Ashiq & Shahir, 2020). According to findings it is evident that government is the main hurdle in implementing the green banking practices in Bangladesh. For the future authors recommend that more research is needed to develop strong bond between the public sector and private sector banks. Further it is recommended by the authors to improve the financial policy making framework that is already adopted by the decision makers of Bangladesh banking industry.
Khatun et al. (2020) explored the nature of green building practices according to different banks of Bangladesh. The main objective was to find the relationship between sustainable development of the environment and green banking practices in Bangladesh (Khatun et al., 2021). Review type methodology was selected by authors and they included the qualitative and quantitative information to find out the crucial factors that could give information about the relationship between sustainable environment development and green building practices. The research recommends the coordination between the different financial and public sector entities in Bangladesh so that better implementation of green building takes place. The study also recommends to make amendments in the regulations by which financial sector of Bangladesh is controlled, to implement green building practices.
Rehman et al. (2021) conducted a study to find out the direct and indirect impact that exist between the green banking and environmental performance, specifically in the context of Pakistani banking sector. The banking sector of Pakistan has grown significantly in the past few years due to which the authors have taken the approach of Structural equation modelling to collect and analyse the data (Rehman et al., 2021). Quantitative methodology is the main research design of this study and it adopts questionnaire based on Likert scale to collect the information of 200 respondents. Results show that policy development is needed in Pakistan if green building needs to be implemented. Authors have provided the recommendations to make the government policy according to the requirements of banking sector of Pakistan. Further recommendations include increasing the environmental performance of banks by investing the green technologies and making the overall sector according to the financial capacity of banks. Javeria et al. (2019) conduted a research on finding the issues that prevent the Pakistani banking sector to adopt the green banking practices. The research design is based on exploratory qualitative analysis in which they tested the theoretical model to appropriately give recommendations to the banking sector of Pakistan. Future recommendations by authors include increasing the collaboration between banks and also working on the commercial sector development because there are more chances that it can easily adopt the sustainable and green banking practices in Pakistan (Javeria et al., 2019).
Park & Kim (2020) conducted a study on finding the challenges that climate change is inflicting on the banking sector. The different tools of financial measures are also evaluated by researchers to promote the implementation of green banking system that can easily fight the impact of climate change on banking sector of Pakistan (Park & Kim, 2020). The methodology is adopted by researchers is based on qualitative study design and it is purely conducted to provide recommendations to the banking sector in adopting green banking practices. Indication of further studies is evident from the article as authors recommend using both qualitative and quantitative research designs to develop profound strategies that could practically overcome the barriers faced by banking industry.
Konuk et al. (2015) condected a study on the green behavior intentions that crucially affect the implementation of green banking system in Pakistn, Turkey and Finland. With the use of structural equation modelling, the hypotheses were analysed. A structural model's findings show a favourable correlation between contentment with the environment, confidence in the environment, and equality in the environment in three different nations (Konuk et al., 2015). The quantitative research design is followed by the authors in which they have used the results from questionnaires to provide specific recommendations in making the three countries more inclined towards the green banking practices. It is recommended by the authors that management should take into account green trust, contentment, and brand equity in the global marketplace while executing green marketing tactics and also to promote the implementation of green banking.
Herath & Herath (2019) conducted a study on the development of a conceptual model that can provide increased satisfaction to the consumers about the green banking and also focus on multiple green initiatives that could possibly make the green banking successful in organizations (Herath & Herath, 2019). Quantitative method of research was adopted by researchers and they have implemented an effective approach to find out the relationship between dependent and independent variables. From the future perspective it is recommended by the authors to increase the implementation of green building initiatives that also produce the convenience and ease of use among the other services of banks. It is the only way by which customers can be satisfied with the performance of banking sector. However it is evident from the banks that there is a need of implementation of further research that could improve the practical implications of green banking initiatives.
Prabhu (2021) conducted a study to find out the impact of various practices related to green banking in Banking sector of India. It was found that eco-friendly policies and efforts to reduce the bank's carbon impact are called

"green" banking practices. Encouraging the banking sector to adopt more environmental friendly practices by incorporating technological advancements and shifting customer preferences is what we mean by this phrase (Prabhu, 2021). Secondary research methodology is adopted by the researcher in which all the information was taken from online sources and Indian banking sector. Future recommendations include the increasing of awareness among the banking industry and also creating the media recognition for the customers. The research also recommends the increment in environmental friendly measures that can promote the banking sector towards green banking. Kanu et al. (2020) conducted a research on bad environment of Nigerian banking sector of Nigeria in which green banking is difficult to implement. There are several green banking goods on display in Nigerian banks, but they have not been given the proper name. According to the findings, the absence of basic ICT skills and illiteracy in Nigeria's rural and urban populations have a detrimental influence on people's understanding of and use of green banking systems. The quantitative research method was adopted by the researchers in which they have used the response from 224 respondents of banking industry of Nigeria (kanu et al., 2020). The future recommendations show that banks need to do a better job of meeting their social responsibility obligations. In order to implement regulations that make green banking operations more user-friendly, the government and service providers must work together.

Naveenan et al. (2021) conducted research on the development of green banking in India and the challenges that create problem for the local banking industry to impelement all sustainable policies to save the environment from damaging (Naveenan et al., 2021). The quantitative research methodology was adopted by researchers in which they used the data to statistically evaluate the research model. Future recommendations by authors include the implementation of financial decision making tools to help policymakers understand the degree of success of green banking services, as well as the areas of development, and this paper provides a great deal of scope for understanding the customer. Studying these new technology-based services will help the government design better regulations to support the banking sector's deployment of these services was also recommended by authors.

Zhixia, Hossen, Muzafary and Begum (2018) utilized “content analysis” of different banks yearly reports, CSR activities documents and green banking initiatives reports on which organizations has worked over the period. This study focused on the journey of green banking in Bangladesh incusing different initiatives which has been taken over the years, the hurdles faced by the banks in the adoption of these green practices and the current scenario. Analysis shows that Bangladesh bank has worked really well on the regulatory measurements and all the banks working under State bank not only following the policies and regulations but also reporting it to the annual reports. This research can be extended by analyzing the factors which can enforce banks to contribute towards environment protection and sustainability considering it as their responsibility.

Nath, Nayak and Goel (2014) said that the arising problems in environment such as droughts, floods etc. have led us to think about the fact that we have to save the environment, no matter what it takes. In this matter many industries and sectors have been working to opt the practices and processes that are environment and nature friendly so that they can play their part in this matter. Green financing and green economy are one of the most emerging topics now-a-days. Many banks and financial institutions are trying to opt green banking and green financing. Banking may not directly relate to environment but the impact of its customers can be taken in account in this matter. Many countries still do not have the proper guidelines related to green banking but different banks and organizations have created their own set of policies and rules that are related to the green banking.

According to Reserve Bank of India (IRDBT, 2014), as the banking is not directly related to the environment but has its impacts too. So the green banking is related to environment in such a way that the internal process or the infrastructure of the banks should be in such a manner that it does not have any bad impact on the environment. Different countries have also created the green ratings for their banks, under which banks are being judged to see the practices of the banks such as recycling etc. Rehman et al., (2021) discussed practices of green banking including policies, operational management and investment trends towards green banking to discuss its effect on the environmental performance of the banks in both direct and indirect manner. SEM technique is used to check the relationship between practices and performance. Results show that there is a significant effect can be drawn directly on the environment by considering policy making and regulatory measurements. This research suggests to explore more factors which can help enforcement of green practices by overcoming the challenges. Lalon (2015) said that any bank can become a green bank by taking its practices into account that how the bank can save the environment and which process of the banks need to be improved in this matter. Green banking has become the buzz word from past few years as the young generation especially is more inclined towards the environmental friendly products. Moreover, the businesses and organizations are now taking the responsibility of the environment but understanding the fact that the environment is the responsibility of everyone. It can be construed from the above representation of preliminary literature that green banking has attained attention of researchers over the period of time but hardly any

study addressed the barriers of implementing green banking. One can find some studies directly or indirectly concerning the issues of green banking in different countries e.g. Bangladesh, India, China etc. but not for Pakistan.

3. Methodology

This study uses the research philosophy of interpretivism that uses data from observation, literature review, interview etc. as it allows to collect the data from such people who have know-how of the topic i.e. the panel of experts as mentioned in this study, even if they are less in number, rather than collecting data from a lot of people which can become meaningless at the time of use as it is not filled by the experts of that field. It follows the qualitative research philosophy. This research uses the inductive approach as this study works for the theory development as well as for the development of a structural model. Moreover, a very little research has been done by researcher on this topic so working with the inductive reasoning is a more practical approach.

3.1. Overall research design

This research is conducted to identify the key barriers of green banking in Pakistan. The factors that can become a barrier to green banking in Pakistan, are identified by the researcher by the help of existing literature as well as from the experts as it is a qualitative research and followed the interpretivism philosophy. For this purpose, firstly a survey is conducted for the verification of the barriers for which a panel of 15 experts is finalized. After the verification, the questionnaire is filled by the experts. These experts are selected on the basis of the fact that they are directly related to green banking for example, customers, banks etc. or from academia etc. that have knowledge about green banking. Experience were also in the criteria of the panel. ISM is the technique of analysis that is used for this research. After ISM, factors are also distributed in 4 quadrants with the help of MICMAC analysis. As this study requires a panel of experts so according to researcher, any person who has a stake in green banking or banking sector of Pakistan is actually the part of population. So the population of this research includes the population on the basis of the fact that which people are directly in connection with banking system or the people who have a stake in green banking whether those are companies, customers, banks, people from IT Sector and people from academia. Moreover, from banking sectors, managers are more preferred. This research uses the purposive sampling that is a non-probability sampling technique. Purposive sampling is based on the fact that researcher will rely on their own judgement of people with their own criteria, for the survey. A heterogeneous panel is finalized for this research by the researcher. The sample size of the panel of experts is 15. An odd number of panel experts was chosen purely on the fact that if there is a tie on any decision between the members and it is an even member panel then decision will be difficult and ambiguous too. Heterogeneous panel here means that experts were from different sectors, different background etc. A matrix type questionnaire of ISM is used as an instrument of measurement by the researcher. A survey is filled by the experts for the verification of the barriers that are identified by researcher from the literature. The survey was filled by 15 experts present in the panel.

3.2. Data collection method

For the purpose of collecting of data, the researcher firstly verifies the prepared list of barriers to green banking in Pakistan by the panel of experts. This list is prepared with the help of existing literature. Primary data is also collected through expert opinion that allows the experts to add or remove any barrier based on their suggestion, opinion and discussion. After the verification of the barriers, a matrix type questionnaire of ISM is filled by the experts on the basis of which, the further analysis of ISM and MICMAC is completed.

3.3. Technique of Data Analysis

ISM and MICMAC are used as the technique of data analysis. ISM is the technique that is used to form the graphical model of the problem that is under consideration (Warfield,1973; Attri et al.,2013). On the other hand, researcher used MICMAC analysis. It is a simple technique that divides a system into four clusters that are independent, autonomous, linkage and dependent. This study used MICMAC analysis to check which factors or determinants fall in which cluster from these four clusters. Classical procedure devised by Godet (1986) is used.

4. Analysis, Results and Discussion

4.1. Interpretive Structural Modeling (ISM)

ISM is the technique in which we build a systematic model by structuring the elements that are related directly or indirectly to each other and it also develops a structural model through which contextual relationship between the factors is explained. Ism is performed with a panel of experts. A panel of 15 experts is selected for this research study. The targeted experts are selected on the basis of their experience, knowledge and understanding of the research topic, environmental issues, green banking etc. and from banks, managers were preferred. Four out of fifteen experts are from academia, four are from banks, one is from environmental agency, two are customers, two are from IT sector and two more are selected from society.

4.2. Identification and verification of barriers

Thirty factors are identified as the barriers to green banking through literature discourse, experts and by researcher. A survey is filled by all the experts in Y or N for verification.

Table 1: Survey for verification of barriers

Sr. No.	Factor	Expert															Yes	No	Included/ Not Included
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
1	Lack of awareness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	14	1	Yes
2	Lack of trained staff	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	12	3	Yes
3	Higher operating cost	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	9	6	Yes
4	Low profit	✓	✓	✓	✓	✓	✗	✗	✓	✗	✓	✗	✓	✗	✓	✓	10	5	Yes
5	Lack of formal guidelines	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14	1	Yes
6	Long startup time	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✗	✓	✓	11	4	Yes
7	Low number of customers	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	11	4	Yes
8	Lack of internal management support	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗	12	3	Yes
9	Lack of stakeholder's support	✓	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	9	6	Yes
10	Lack of proper policies	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✗	✓	✓	11	4	Yes
11	Operational and market risk	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	13	2	Yes
12	Lack of monitoring green banking practices	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14	1	Yes
13	Lack of stakeholders involvement	✓	✓	✗	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	11	4	Yes
14	Acceptability of card based transaction	✗	✓	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓	✗	✗	✗	8	7	Yes
15	Acceptability of paperless statement	✗	✓	✓	✓	✓	✓	✓	✗	✓	✗	✗	✓	✗	✗	✓	9	6	Yes
16	Lack of awareness about renewable resources	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	10	5	Yes
17	Lack of employee interest	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	10	5	Yes
18	Lack of support for environmental agencies	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14	1	Yes
19	Weak infrastructure	✓	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	8	7	Yes
20	Lack of support for green projects	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	12	3	Yes
21	Lack of internal capacity	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓	10	5	Yes
22	Lack of implementation of regulations	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	12	3	Yes
23	Lack of capital cost	✗	✓	✗	✓	✗	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	9	6	Yes
24	Lack of performance indicators	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14	1	Yes
25	Lack of environmental experts	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	12	3	Yes
26	Lack of public concerns	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✓	11	4	Yes
27	Lack of resources	✗	✓	✓	✗	✗	✓	✗	✗	✓	✓	✗	✓	✗	✓	✗	7	8	No

28	Lack of technology	✗	✓	✓	✗	✗	✓	✗	✓	✗	✓	✗	✓	✓	✓	✓	9	6	Yes
29	Lack of government interest	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	14	1	Yes
30	Lack of legal framework	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	11	4	Yes

Table 2: Final list of barriers

	Code	Barriers
1		Lack of awareness
2		Lack of trained staff
3		Higher operating cost
4		Low profit
5		Lack of formal guidelines
6		Long startup time
7		Low number of customers
8		Lack of internal management support
9		Lack of stakeholder's involvement
10		Operational and market risk
11		Lack of monitoring green banking practices
12		Acceptability of card based transaction
13		Acceptability of paperless statement
14		Lack of awareness about renewable resources
15		Lack of employee interest
16		Lack of support for environmental agencies
17		Weak infrastructure
18		Lack of support for green projects
19		Lack of internal capacity
20		Lack of implementation of regulations
21		Lack of capital cost
22		Lack of performance indicators
23		Lack of environmental experts
24		Lack of public concerns
25		Lack of technology
26		Lack of government interest
27		Lack of legal framework

4.3. Structural self-interaction matrix (SSIM)

SSIM i.e. Structural Self-Interpretive matrix is developed by the aggregation of *ij* data collected from the experts in the form of VAXO.

Table 3: Structural self-interaction matrix (SSIM)

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1		A	O	V	A	V	V	O	V	V	V	V	V	V	V	V	V	X	O	V	O	A	A	V	A	A	A
2			V	V	A	V	V	A	O	V	V	V	V	V	A	O	V	V	A	V	O	A	X	O	A	A	A
3				V	O	A	O	V	V	V	O	O	O	A	O	V	A	V	A	O	V	O	O	V	V	V	O
4					O	A	X	X	X	X	A	O	O	A	V	V	A	X	A	O	A	O	O	V	A	A	O
5						O	V	O	O	V	A	V	V	O	V	O	O	V	O	V	O	V	A	V	O	A	V
6							V	V	V	V	O	O	O	A	O	V	A	V	A	O	V	V	O	V	A	V	O
7								V	V	A	A	A	A	A	X	V	O	X	A	V	O	O	A	A	O	A	A
8									A	A	V	O	O	A	V	V	O	V	O	V	A	A	V	A	O	A	A
9										A	A	O	O	A	V	V	O	V	O	V	A	O	O	A	O	A	A
10											O	O	O	A	A	A	A	V	A	A	O	O	A	X	A	X	A
11												O	O	V	A	V	V	V	O	V	O	V	A	V	O	A	A
12													A	A	A	A	O	V	O	O	O	O	O	A	O	A	O
13														A	V	A	O	X	O	O	O	O	O	A	O	A	O
14															V	V	V	V	O	A	O	O	A	V	O	A	A
15																A	O	V	O	V	O	A	V	A	A	A	A
16																	V	X	A	A	A	O	V	A	O	A	A
17																		V	A	V	V	O	O	V	V	A	V
18																			A	A	A	A	A	A	O	A	O
19																				V	O	O	O	V	V	A	O
20																					O	A	A	V	A	A	A
21																						O	O	O	V	A	O
22																							A	V	A	A	O
23																								A	A	A	O
24																									O	A	A
25																										A	O
26																											V
27																											

4.4. Binary coded matrix

The rules of converting VAXO in *ji* and *ij* part of matrix is followed from the Warfield (1973). This leads to the initial reachability matrix. VAXO are converted into 1 and 0 accordingly in *ij* and *ji* part of the matrix.

Table 4: Initial reachability matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	0	0	0
2	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	1	1	0	1	0	0	1	0	0	0	0
3	0	0	1	1	0	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	1	1	1	0
4	0	0	0	1	0	0	1	1	1	1	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0
5	1	1	0	0	1	**0**	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	1	0	1	0	0	1
6	0	0	1	1	0	1	1	1	1	1	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	0
7	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0
8	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	0
9	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0
10	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0
11	0	0	0	1	1	0	1	0	1	0	1	0	0	1	0	1	1	1	0	1	0	1	0	1	0	0	0
12	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0
14	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0
15	0	1	0	0	0	0	1	0	0	1	1	1	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0
16	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	1	0	0	0	0	1	0	0	0	0
17	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	1
18	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
19	0	1	1	1	0	1	1	0	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	0	0
20	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	0	0
21	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0
22	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	0	0
23	1	1	0	0	1	0	1	0	0	1	1	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0
24	0	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	0	1	0	0	0	0	1	1	0	0	0
25	1	1	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	1	0	1	0	0
62	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	1	0	0	0	1	0	0	1

4.5. Transitive binary-coded matrix

As ISM works on the assumption of transitivity so, the initial reachability matrix is checked for transitivity. The transitivity is checked by the researcher in MS Excel.

4.6. Determination of hierarchies from the transitive binary

Iteration method is used here for determining the levels of the barriers present in the transitive binary-coded matrix.

Table 5: Final Reachability matrix

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Driving
1	**1**	**1***	**1***	**1**	**1***	**1**	**1**	**1***	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**26**
2	**1**	**1**	**1**	**1**	**1***	**1**	**1**	**1***	**1***	**1**	**1**	**1**	**1**	**1**	**1***	**1***	**1**	**1**	**0**	**1**	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**26**
3	**1***	**1***	**1**	**1**	**1***	**1***	**1***	**1**	**1**	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1**	**1***	**1***	**1**	**1***	**1***	**1**	**1**	**1**	**1***	**27**
4	**1***	**1***	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**1**	**1***	**1***	**1***	**0**	**1**	**1**	**1***	**1**	**0**	**1***	**0**	**0**	**1***	**1**	**0**	**1***	**0**	**18**
5	**1**	**1**	**1***	**1***	**1**	**1***	**1**	**1***	**1***	**1**	**1***	**1**	**1**	**1***	**1**	**1***	**1***	**1**	**0**	**1**	**0**	**1**	**1***	**1**	**0**	**1***	**1**	**24**
6	**1***	**1***	**1**	**1**	**1***	**1**	**1**	**1**	**1**	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1**	**1***	**1***	**1**	**1**	**1***	**1**	**1***	**1**	**1***	**27**
7	**1***	**1***	**0**	**1***	**0**	**0**	**1**	**1**	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1**	**1***	**1**	**0**	**1**	**0**	**0**	**1***	**1***	**0**	**0**	**0**	**18**
8	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1**	**1***	**1***	**1***	**1**	**1**	**1***	**1**	**0**	**1**	**0**	**1***	**1**	**1***	**0**	**0**	**0**	**22**
9	**1***	**1***	**0**	**1***	**0**	**0**	**1***	**1**	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1**	**1***	**1**	**0**	**1**	**0**	**0**	**1***	**1***	**0**	**0**	**0**	**18**
10	**1***	**1***	**0**	**1***	**1***	**0**	**1**	**1**	**1**	**1**	**1***	**1***	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1**	**1***	**25**
11	**1***	**1***	**1***	**1**	**1**	**1***	**1**	**1***	**1**	**1***	**1**	**1***	**1***	**1**	**1***	**1**	**1**	**1**	**0**	**1**	**1***	**1***	**1**	**1***	**1**	**0**	**1***	**25**
12	**1***	**0**	**0**	**1***	**0**	**0**	**1**	**1***	**1***	**0**	**0**	**1**	**1***	**0**	**1***	**1***	**0**	**1**	**0**	**1***	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**
13	**1***	**1***	**0**	**1***	**0**	**0**	**1**	**1***	**1***	**1***	**1***	**1**	**1**	**0**	**1**	**1***	**0**	**1**	**0**	**1***	**0**	**0**	**1***	**0**	**0**	**0**	**0**	**15**
14	**1***	**1***	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**1***	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**25**
15	**1***	**1**	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1**	**1**	**1**	**1***	**1***	**1**	**1***	**1***	**1**	**0**	**1**	**0**	**1***	**1**	**1***	**0**	**1***	**0**	**23**
16	**1***	**1***	**1***	**1***	**0**	**1***	**1***	**1***	**1***	**1**	**1***	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**0**	**1***	**1***	**0**	**1**	**1***	**1***	**1***	**1***	**23**
17	**1***	**1***	**1**	**1**	**0**	**1**	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1***	**1**	**1**	**0**	**1**	**1**	**1***	**1***	**1**	**1**	**1***	**1**	**25**
18	**1**	**0**	**0**	**1**	**0**	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1**	**1***	**1**	**0**	**1***	**0**	**0**	**1***	**1***	**0**	**0**	**0**	**18**
19	**1***	**1**	**1**	**1**	**0**	**1**	**1**	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1**	**1**	**1**	**1**	**1**	**1***	**1***	**1***	**1**	**1**	**1***	**1***	**26**
20	**1***	**0**	**1***	**1***	**0**	**1***	**1***	**1***	**1***	**1**	**0**	**1***	**1***	**1**	**1***	**1**	**1***	**1**	**0**	**1**	**0**	**0**	**1***	**1**	**0**	**1***	**0**	**19**
21	**1***	**1***	**0**	**1**	**0**	**1***	**1***	**1**	**1**	**1***	**1***	**1***	**1***	**0**	**1***	**1**	**1***	**1**	**0**	**1***	**1**	**1***	**1***	**1***	**1**	**0**	**0**	**21**
22	**1**	**1**	**1***	**1***	**0**	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1**	**0**	**1**	**0**	**1**	**1***	**1**	**0**	**0**	**0**	**21**
23	**1**	**1**	**1***	**1***	**1**	**1***	**1**	**1***	**1***	**1**	**1**	**1***	**1***	**1**	**1***	**1***	**1***	**1**	**0**	**1**	**0**	**1**	**1**	**1***	**0**	**1***	**1***	**24**
24	**1***	**1***	**0**	**1***	**1***	**0**	**1**	**1**	**1**	**1**	**1***	**1**	**1**	**1***	**1**	**1**	**1***	**1**	**0**	**1***	**0**	**1***	**1**	**1**	**0**	**1***	**0**	**21**
25	**1**	**1**	**1***	**1**	**1***	**1**	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**1***	**1**	**1***	**1***	**1***	**0**	**1**	**1***	**1**	**1**	**1***	**1**	**1***	**0**	**25**
26	**1**	**1**	**1***	**1**	**1**	**1***	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**27**
27	**1**	**1**	**1***	**1***	**1***	**1***	**1**	**1**	**1**	**1**	**1**	**1***	**1***	**1**	**1**	**1**	**1***	**1***	**0**	**1**	**0**	**1***	**1***	**1**	**0**	**1***	**1**	**24**
Dependence	**27**	**24**	**18**	**27**	**14**	**20**	**27**	**27**	**27**	**26**	**25**	**27**	**27**	**22**	**27**	**27**	**25**	**27**	**5**	**27**	**13**	**19**	**26**	**25**	**13**	**18**	**14**	

Table 6: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
1	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27	*I*

2	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,19,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,21,22,23,24,25,26,27	
3	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,5,6,10,11,14,15,16,17,19,20,22,23,25,26,27	1,2,3,5,6,10,11,14,15,16,17,19,20,22,23,25,26,27	
4	1,2,4,7,8,9,10,11,12,13,15,16,17,18,20,23,24,26	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,7,8,9,10,11,12,13,15,16,17,18,20,23,24,26	*I*
5	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26,27	1,2,3,5,6,8,10,11,15,23,24,25,26,27	1,2,3,5,6,8,10,11,15,23,24,26,27	
6	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,5,6,8,11,14,15,16,17,18,19,20,21,22,23,25,26,27	1,2,3,5,6,8,11,14,15,16,17,18,19,20,21,22,23,25,26,27	
7	1,2,4,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	*I*
8	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24	*I*
9	1,2,4,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	*I*
10	1,2,4,5,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,5,7,8,9,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	
11	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,19,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,21,22,23,24,25,27	
12	1,4,7,8,9,12,13,15,16,18,20	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,4,7,8,9,12,13,15,16,18,20	*I*
13	1,2,4,7,8,9,10,11,12,13,15,16,18,20,23	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,7,8,9,10,11,12,13,15,16,18,20,23	*I*
14	1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27	1,2,3,5,6,7,8,9,10,11,14,15,17,18,19,20,22,23,24,25,26,27	1,2,3,6,7,8,9,10,11,14,15,17,18,20,22,23,24,25,26,27	
15	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26	*I*
16	1,2,3,4,6,7,8,9,10,11,12,13,15,16,17,18,20,21,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,6,7,8,9,10,11,12,13,15,16,17,18,20,21,23,24,25,26,27	*I*
17	1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,6,7,8,9,10,11,14,15,16,17,18,20,21,22,23,24,25,26,27	
18	1,4,6,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,4,6,7,8,9,10,11,12,13,14,15,16,17,18,20,23,24	*I*
19	1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	3,6,10,19,26	3,6,10,19,26	
20	1,3,4,6,7,8,9,10,12,13,14,15,16,17,18,20,23,24,26	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,3,4,6,7,8,9,10,12,13,14,15,16,17,18,20,23,24,26	*I*
21	1,2,4,6,7,8,9,10,11,12,13,15,16,17,18,20,21,22,23,24,25	1,2,3,6,10,11,14,16,17,19,21,25,26	1,2,6,10,11,16,17,21,25	
22	1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24	1,2,3,5,6,8,10,11,14,15,17,19,21,22,23,24,25,26,27	1,2,3,6,8,10,11,14,15,17,22,23,24	
23	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,20,22,23,24,26,27	
24	1,2,4,5,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26	1,2,3,4,5,6,7,8,9,10,11,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,4,5,7,8,9,10,11,14,15,16,17,18,20,22,23,24,26	
25	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25,26	1,2,3,6,10,11,14,16,17,19,21,25,26	1,2,3,6,10,11,14,16,17,21,25,26	
26	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	1,2,3,4,5,6,10,14,15,16,17,19,20,23,24,25,26,27	1,2,3,4,5,6,10,14,15,16,17,19,20,23,24,25,26,27	
27	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,22,23,24,26,27	1,2,3,5,6,10,11,14,16,17,19,23,26,27	1,2,3,5,6,10,11,14,16,17,23,26,27	

Table 7: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
2	2,3,5,6,10,11,14,17,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,21,22,23,24,25,26,27	*II*
3	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,19,22,23,25,26,27	2,3,5,6,10,11,14,17,19,22,23,25,26,27	
5	2,3,5,6,10,11,14,17,22,23,24,26,27	2,3,5,6,10,11,23,24,25,26,27	2,3,5,6,10,11,23,24,26,27	
6	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,11,14,17,19,21,22,23,25,26,27	2,3,5,6,11,14,17,19,21,22,23,25,26,27	
10	2,5,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,5,10,11,14,17,19,21,22,23,24,25,26,27	*II*
11	2,3,5,6,10,11,14,17,21,22,23,24,25,27	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,21,22,23,24,25,27	*II*
14	2,3,6,10,11,14,17,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,19,22,23,24,25,26,27	2,3,6,10,11,14,17,22,23,24,25,26,27	
17	2,3,6,10,11,14,17,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,6,10,11,14,17,21,22,23,24,25,26,27	*II*
19	2,3,6,10,11,14,17,19,21,22,23,24,25,26,27	3,6,10,19,26	3,6,10,19,26	
21	2,6,10,11,17,21,22,23,24,25	2,3,6,10,11,14,16,17,19,21,25,26	2,6,10,11,17,21,25	
22	2,3,6,10,11,14,17,22,23,24	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,6,10,11,14,17,22,23,24	*II*
23	2,3,5,6,10,11,14,17,22,23,24,26,27	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,11,14,17,22,23,24,26,27	*II*
24	2,5,10,11,14,17,22,23,24,26	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,5,10,11,14,17,22,23,24,26	*II*
25	2,3,5,6,10,11,14,17,21,22,23,24,25,26	2,3,6,10,11,14,17,19,21,25,26	2,3,6,10,11,14,17,21,25,26	
26	2,3,5,6,10,11,14,17,19,21,22,23,24,25,26,27	2,3,5,6,10,14,17,19,23,24,25,26,27	2,3,5,6,10,14,17,19,23,24,25,26,27	
27	2,3,5,6,10,11,14,17,22,23,24,26,27	2,3,5,6,10,11,14,17,19,23,26,27	2,3,5,6,10,11,14,17,23,26,27	

Table 8: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
3	3,5,6,14,19,21,25,26,27	3,5,6,14,19,25,26,27	3,5,6,14,19,25,26,27	
5	3,5,6,14,26,27	3,5,6,25,26,27	3,5,6,26,27	
6	3,5,6,14,19,21,25,26,27	3,5,6,14,19,21,25,26,27	3,5,6,14,19,21,25,26,27	*III*
14	3,6,14,21,25,26,27	3,5,6,14,19,25,26,27	3,6,14,25,26,27	
19	3,6,14,19,21,25,26,27	3,6,19,26	3,6,19,26	
21	6,21,25	3,6,14,16,19,21,25,26	6,21,25	*III*
25	3,5,6,14,21,25,26	3,6,14,19,21,25,26	3,6,14,21,25,26	
26	3,5,6,14,19,21,25,26,27	3,5,6,14,19,25,26,27	3,5,6,14,19,25,26,27	
27	3,5,6,14,26,27	3,5,6,14,19,26,27	3,5,6,14,26,27	*III*

Table 9: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
3	3,5,14,19,25,26	3,5,14,19,25,26	3,5,14,19,25,26	*IV*
5	3,5,14,26	3,5,25,26	3,5,26	
14	3,14,25,26	3,5,14,19,25,26	3,14,25,26	*IV*
19	3,14,19,25,26	3,19,26	3,19,26	
25	3,5,14,25,26	3,14,19,25,26	3,14,25,26	
26	3,5,14,19,25,26	3,5,14,19,25,26	3,5,14,19,25,26	*IV*

Table 10: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
5	5	5,25	5	*V*
19	19,25	19	19	
25	5,25	19,25	25	

Table 11: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
19	19,25	19	19	
25	25	19,25	25	*VI*

Table 12: Iterations (level partitions)

Code	Reachability Set	Antecedent set	Intersection Set	Level
19	19	19	19	*VII*

Table 13: Conical Matrix

Reachability

Level	Code	1	4	7	8	9	12	13	15	16	18	20	2	10	11	17	22	23	24	6	21	27	3	14	26	5	25	19	
Level I	1	1	1	1	1*	1	1	1	1	1	1	1	1*	1	1	1	1*	1*	1	1	1*	1*	1*	1	1*	1*	1*	0	26
	4	1*	1	1	1	1	1*	1*	1	1	1	1*	1*	1	1*	1*	0	1*	1	0	0	0	0	0	1*	0	0	0	18
	7	1*	1*	1	1	1	1*	1*	1	1	1	1	1*	1	1*	1*	0	1*	1*	0	0	0	0	1*	0	0	0	0	18
	8	1*	1*	1*	1	1*	1*	1*	1	1	1	1	1	1	1	1*	1*	1	1*	1*	0	0	1*	1*	0	1*	0	0	22
	9	1*	1*	1*	1	1	1*	1*	1	1	1	1	1*	1	1*	1*	0	1*	1*	0	0	0	0	1*	0	0	0	0	18
	12	1*	1*	1	1*	1*	1	1*	1*	1*	1	1*	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
	13	1*	1*	1	1*	1*	1	1	1	1*	1	1*	1*	1*	1*	0	0	1*	0	0	0	0	0	0	0	0	0	0	15
	15	1*	1*	1	1*	1*	1	1*	1	1*	1	1	1	1*	1	1*	1*	1	1*	1*	0	0	1*	1*	1*	1*	0	0	23
	16	1*	1*	1*	1*	1*	1	1	1	1	1	1*	1*	1*	1*	1	0	1	1*	1*	1*	1*	1*	1*	0	1*	0	1*	23
	18	1	1	1	1*	1*	1*	1	1*	1	1	1*	0	1	1*	1*	0	1*	1*	1*	0	0	0	1*	0	0	0	0	18
	20	1*	1*	1*	1*	1*	1*	1*	1*	1	1	1	0	1*	0	1*	0	1*	1	1*	0	0	1*	1	1*	0	0	0	19
Level II	2	1	1	1	1*	1*	1	1	1*	1*	1	1	1	0	1	1	1*	1	1*	1	1*	1*	1	1	1*	1*	1*	0	26
	10	1*	1*	1	1	1	1*	1*	1*	1*	1	1*	1*	1	1*	1*	1*	1*	1	0	1*	1*	0	1*	1	1*	1*	1*	25
	11	1*	1	1	1*	1	1*	1*	1*	1	1	1	1*	1	1	1	1	1*	1	1*	1*	1*	1*	1	0	1	1*	0	25
	17	1*	1	1*	1*	1*	1*	1*	1*	1*	1	1	1*	1	1*	1	1*	1*	1	1	1	1	1	1*	1*	0	1	0	25
	22	1	1*	1*	1	1*	1*	1*	1	1*	1	1	1	1*	1*	1*	1	1*	1	1*	0	0	1*	1*	0	0	0	0	21
	23	1	1*	1	1*	1*	1*	1*	1*	1*	1	1	1	1	1	1*	1	1	1*	1*	0	1*	1*	1	1*	1	0	0	24
	24	1*	1*	1	1	1	1	1	1	1	1	1*	1*	1	1*	1*	1*	1	1	0	0	0	0	1*	1*	1*	0	0	21
Level III	6	1*	1	1	1	1	1*	1*	1*	1	1	1*	1*	1	1*	1*	1	1*	1	1	1	1*	1	1*	1	1*	1*	1*	27
	21	1*	1	1*	1	1	1*	1*	1*	1	1	1*	1*	1*	1*	1*	1*	1*	1*	1*	1	0	0	0	0	0	1	0	21
	27	1	1*	1	1	1	1*	1*	1	1	1*	1	1	1	1	1*	1*	1*	1	1*	0	1	1*	1	1*	1*	0	0	24
Level IV	3	1*	1	1*	1	1	1*	1*	1*	1	1	1*	1*	1*	1*	1*	1*	1*	1	1*	1	1*	1	1*	1	1*	1	1*	27
	14	1*	1	1	1	1	1	1	1	1	1	1*	1*	1*	1*	1	1*	1*	1	1	1*	1*	1	1	1*	0	1*	0	25
	26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1*	1	1	1*	1	1	1	1	1	27
Level V	5	1	1*	1	1*	1*	1	1	1	1*	1	1	1	1	1*	1*	1	1*	1	1*	0	1	1*	1*	1*	1	0	0	24
Level VI	25	1	1	1*	1*	1*	1*	1*	1	1*	1*	1	1	1	1*	1*	1	1	1*	1	1*	0	1*	1*	1*	1*	1	0	25
Level VII	19	1*	1	1	1*	1*	1*	1*	1*	1	1	1	1	1	1*	1	1*	1*	1	1	1*	1*	1	1*	1*	0	1	1	26
		27	27	27	27	27	27	27	27	27	27	27	24	26	25	25	19	26	25	20	13	14	18	22	18	14	13	5	

Antecedent

Driving Power

Dependence Power

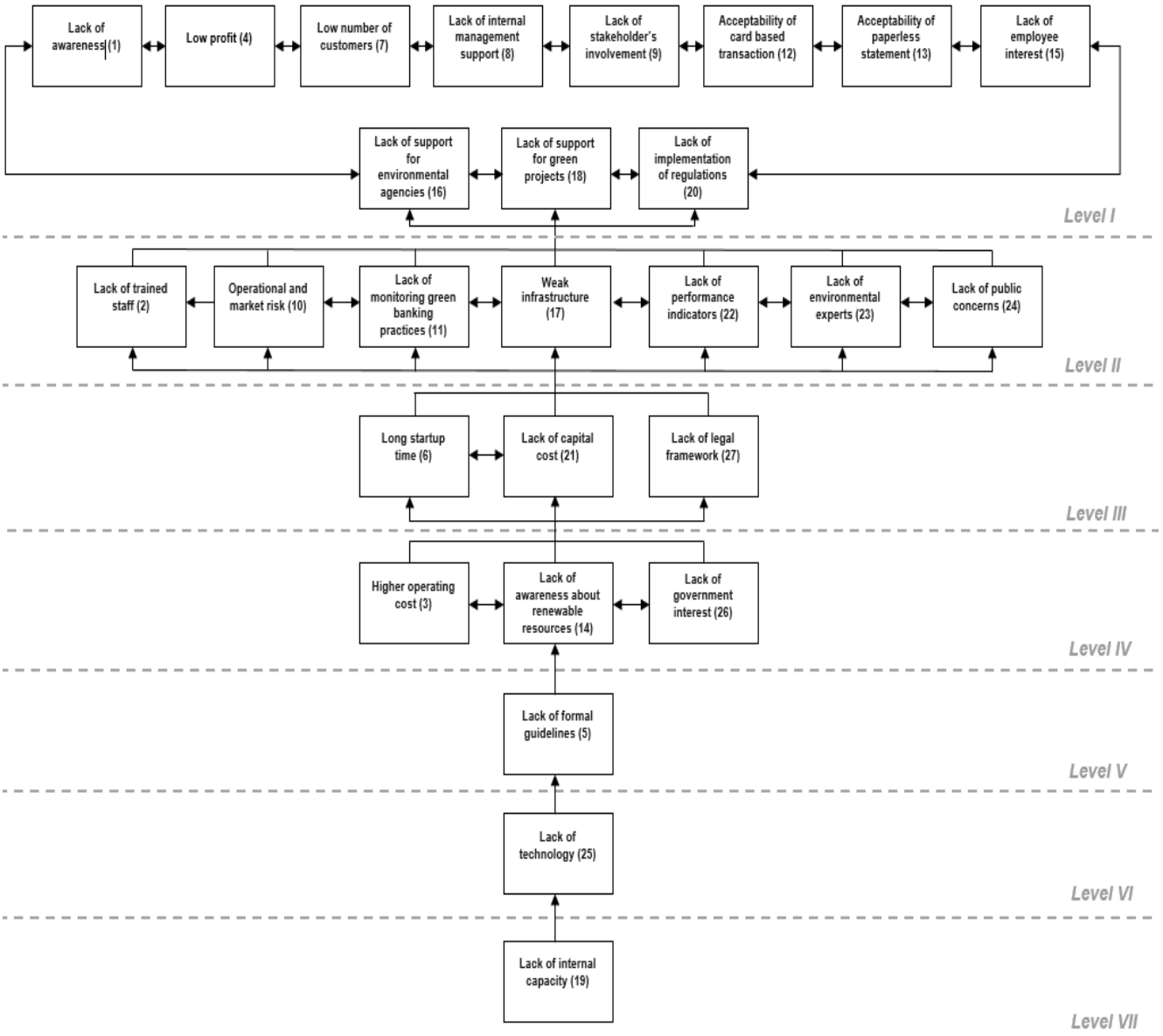

Figure 1: Structural model

4.7. Building ISM model

When the levels are determined with the help of partitioning that are on the conical matrix, with the help of that conical matrix and iterations, a structural model is created.

Figure 1 shows the structural model with its level partitions that how on the basis of iterations, the factors or barriers are divided into different levels.

4.8. MICAMAC Analysis

It is a simple technique that divides a system into four clusters that are independent, autonomous, linkage and dependent. This study uses MICMAC analysis to check which factors or determinants fall in which cluster from these four clusters.

5. Results

This research study provides a better understanding about the barriers to green banking in Pakistan and also provides a structural model to show which barriers are important to be handled first. It also provides the graph where factors are distributed according to the driving and dependence power. There are hurdles in the way of green banking in the form of different factors that are not letting green banking to prevail in the country. So, identifying and analyzing

those barriers is really important. The aim of this study is to investigate the barriers to green banking in Pakistan. ISM and MICMAC is used in this research study as the technique of data analysis.

From the literature, thirty barriers are identified out of which after verification of experts, a list of 27 barriers to green banking is generated viz: lack of awareness (1), lack of trained staff (2), higher operating cost (3), low profit (4), lack of formal guidelines (5), long startup time (6), low number of customers (7), lack of internal management support (8), lack of stakeholder's involvement (9), operational and market risk (10), lack of monitoring green banking practices (11), acceptability of card based transaction (12), acceptability of paperless statement (13), lack of awareness about renewable resources (14), lack of employee interest (15), lack of support for environmental agencies (16), weak infrastructure (17), lack of support for green projects (18), lack of internal capacity (19), lack of implementation of regulations (20), lack of capital cost (21), lack of performance indicators (22), lack of environmental experts (23), lack of public concerns (24), lack of technology (25), lack of government interest (26), lack of legal framework (27).

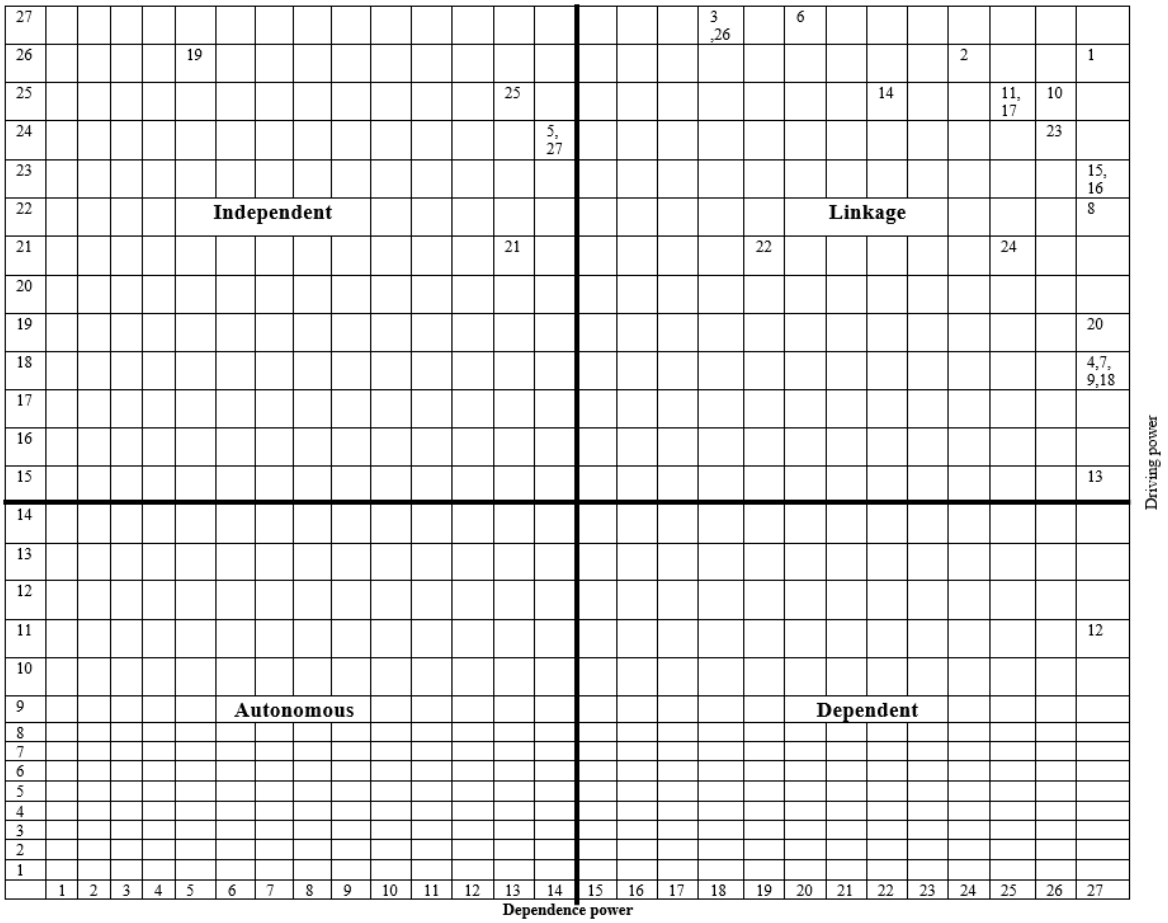

Figure 2: MICMAC Analysis

Results of ISM reveals that lack of awareness (1), low profit (4), low number of customers (7), lack of internal management support (8), lack of stakeholder's involvement (9), acceptability of card based transaction (12), acceptability of paperless statement (13), lack of employee interest (15), lack of support for environmental agencies (16), lack of support for green projects (18) and lack of implementation of regulations (20) fall at *Level I*. lack of trained staff (2), operational and market risk (10), lack of monitoring green banking practices (11), weak infrastructure (17), lack of performance indicators (22), lack of environmental experts (23) and lack of public concerns (24) fall at *Level II*. Long startup time (6), lack of capital cost (21) and lack of legal framework (27) fall at *Level III*. Higher operating cost (3), lack of awareness about renewable resources (14) and lack of government interest (26) fall at *Level IV*. Lack of formal guidelines (5) fall at *Level V*. lack of technology (25) fall at *Level VI* and lack of internal capacity (19) fall at *Level VII*. Bottom level barriers are the one that are to be considered the most important barriers or factors, also called as the key barriers. The key barrier of green banking according to this

study and analysis is lack of internal capacity (19) as it is at the last level. Moreover, lack of technology (25) and lack of formal guidelines (5) are also considered as important factors as they are at the bottom level. These are the factors that are needed to be addressed first. The factors on the center levels are considered to be moderate factors. The structural model presented by this study showed that there is a two-way relationship between all the factors that means all the factors affect each other except lack of trained staff (2), operational and market risk (10), lack of capital cost (21) and lack of legal framework (27) as lack of capital cost (21) and lack of legal framework (27) did not have any affect or impact on each other while in case of lack of trained staff (2) and operational and market risk (10) only operational and market risk (10) affected the other i.e. lack of trained staff (2).

Results of MICMAC analysis reveals that there are no factors in autonomous cluster according to this study. Autonomous factors are the one that are a bit disconnected from the system that means they have weak driving power and weak dependence power. Acceptability of card based transaction (12) fall in dependent cluster that means it has high dependence power but low driving power as dependent factors have weak driving power but their dependence power is strong. Lack of awareness (1), lack of trained staff (2), higher operating cost (3), low profit (4), long startup time (6), low number of customers (7), lack of internal management support (8), lack of stakeholder's involvement (9), operational and market risk (10), lack of monitoring green banking practices (11), acceptability of paperless statement (13), lack of awareness about renewable resources (14), lack of employee interest (15), lack of support for environmental agencies (16), weak infrastructure (17), lack of support for green projects (18), lack of implementation of regulations (20), lack of performance indicators (22), lack of environmental experts (23), lack of public concerns (24) and lack of government interest (26) fall in linkage cluster that means they have high dependence power as well as high driving power. Lack of formal guidelines (5), lack of internal capacity (19), lack of capital cost (21), lack of technology (25) and lack of legal framework (27) fall in independent cluster that means they have strong driving power and weak dependence power.

Table 14: Result Summary

Code	Issue	Driving	Dependence	Effectiveness	Cluster	Level	Comment
1	Lack of awareness	26	27	-1	Linkage	*I*	
2	Lack of trained staff	26	24	2	Linkage	*II*	
3	Higher operating cost	27	18	9	Linkage	*IV*	
4	Low profit	18	27	-9	Linkage	*I*	
5	Lack of formal guidelines	24	14	10	Independent	*V*	
6	Long startup time	27	20	7	Linkage	*III*	
7	Low number of customers	18	27	-9	Linkage	*I*	
8	Lack of internal management support	22	27	-5	Linkage	*I*	
9	Lack of stakeholder's involvement	18	27	-9	Linkage	*I*	
10	Operational and market risk	25	26	-1	Linkage	*II*	
11	Lack of monitoring green banking practices	25	25	0	Linkage	*II*	
12	Acceptability of card based transaction	11	27	-16	Dependent	*I*	
13	Acceptability of paperless statement	15	27	-12	Linkage	*I*	
14	Lack of awareness about renewable resources	25	22	3	Linkage	*IV*	
15	Lack of employee interest	23	27	-4	Linkage	*I*	
16	Lack of support for environmental agencies	23	27	-4	Linkage	*I*	
17	Weak infrastructure	25	25	0	Linkage	*II*	
18	Lack of support for green projects	18	27	-9	Linkage	*I*	
19	*Lack of internal capacity*	*26*	*05*	*21*	*Independent*	*VII*	*Key Factor*
20	Lack of implementation of regulations	19	27	-8	Linkage	*I*	
21	Lack of capital cost	21	13	8	Independent	*III*	
22	Lack of performance indicators	21	19	2	Linkage	*II*	
23	Lack of environmental experts	24	26	-2	Linkage	*II*	
24	Lack of public concerns	21	25	-4	Linkage	*II*	
25	Lack of technology	25	13	12	Independent	*VI*	
26	Lack of government interest	27	18	9	Linkage	*IV*	
27	Lack of legal framework	24	14	10	Independent	*III*	

6. Discussion

The purpose of this study is to find and analyze the factors that are creating hurdles for green banking to prevail in Pakistan and also to find out the key factors that plays the role of main barrier which causes other barriers too (RM., 2019). The ism model of this study is helpful for the academia and banking sector, both. There are not much studies in Pakistan on green banking, even the studies that have been done, do not point out the key barrier in such way by using ISM and MICMAC. The factors are identified from the existing literature and by the researcher. The panel of experts verified the 27 factors out of 30. The techniques used for analysis were ISM and MICMAC. The results of analysis stated how much of a big hurdle these factors are becoming for green banking to prevail in Pakistan. It also discussed the results on the basis of driving and dependence power of the factors that which factors are need to be addressed first. Zhang, et al., (2022) conducted a research in Bangladesh in 2022. The aim of the study was to identify the level of impact caused by the green banking activities on environmental performance of banks. This

study also discussed the challenges and benefits of green banking in developing economies such as Bangladesh. The techniques used for this research study by the researcher were Convenience sampling technique and SEM. The result of the study shows that inclusion of green banking related activities can cause a positive effect only on green financing but also have a significant effect on environmental perspective. Moreover, addressing the challenges was considered important for the growth of green banking practices in the country but this study did not talk about the barriers in detail. In the current study, main focused is on the barriers to green banking with more main factors as many factors or challenges are missing from (Zhang, et al., 2022) study, because the challenges of green banking were not the main purpose of the paper.

Khan, et al., (2022), conducted a research in 2022 by using literature review and survey. The aim of the study was to Identify and quantify the barriers to adopting a green finance system. The researcher identified 20 barriers of green financing system by existing literature and after verification by the experts, 17 were selected. The techniques used by the researcher were ISM and MICMAC. The results showed that Global level factors are critical to the prevalence of other factors that indicate its centrality to effectively implementing the green finance system. But the current study considered more factors than the study of (Khan, et al., 2022) so that the work can be done in detail.

Qi, et al., (2021) conducted a research in China in 2021. The aim of the study was to investigate the difficulties associated with green credit implementation. The method of questionnaire and survey was used for this research. The results stated that Different perceptions exist among managers of Chinese banks with different ownership structures and market shares. But the study of (Qi, et al., 2021) did not discussed the social barriers that are being discussed in the current research by the researcher.

Ashiq & Shahir., (2019) conducted a research in Bangladesh in 2019. The aim of the study was to identify the major challenges that Green Banking is facing in Bangladesh. The method used in this research by the researcher were Interview, Secondary data and Literature review. The results of this study stated that a strong working relation should be crafted between the public sector and private sector to achieve the fruits of Green Banking. But (Ashiq & Shahir., 2019) did not discussed much challenges and focused on only few one while current study provides a wide range of barriers as well as a structural model to understand which factors are important.

RM., (2019) conducted a research in India in 2019. The aim of the study was to investigate the changing trends in Green Banking and the emerging challenges in introducing or implementing it in India. The method that was used for this purpose included Literature review, Survey method and Interview. The results were focused on constructive discourse on Green Banking and its challenges. But current study also provides a detailed analysis on the barriers as well as a graph and model to understand the relationship and importance to be addressed first is given, that was not present in the above discussed study.

6.1. Practical implications of the study

This study will provide an idea about the barriers to green banking in Pakistan as it presents a structural model of barriers to green banking. This will help the regulators and government to take such steps or make such regulations that can be helpful to remove these hurdles from the way of green banking in Pakistan to prevail. Moreover, it will help the customers to identify what green banking actually is as well as which are the factors from the customer side that can become a barrier for green banking as with the progress in world, people especially youngsters are more inclined towards the green practices. This study will be helpful for IT sector to recognize how they can add value to the technological side and also for banks that how that can make such policies that can allow them to opt green banking practices in a better way.

6.2. Theoretical implications of the study

After reviewing the existing literature and conducting interviews, by the help of ISM as analysis technique, a structural model is developed for the barriers to green banking in Pakistan. This study also provides the contextual relationship as well as the key barriers that are rare to find in existing studies of green banking especially in case of Pakistan. So, it will add value to the existing literature and body of knowledge as for further studies it will help to test the theories related to the factors that are mentioned as barriers in this research study.

6.3. Limitations of the study

This study discusses 27 factors that can become a barrier for green banking in Pakistan. There can be more factors too that are needed to be discussed but are not present in this study. Moreover, the factors are extracted from the existing literature and with the help of experts that can also vary with further literature or with more experts. Also this study was conducted only in Pakistan.

6.4. Recommendations for future research

Future researchers should work on other factors too that can possibly become the barrier for green banking in Pakistan. More experts and a wide view of literature should also be part of future researches. Moreover, researches should be conducted on the factors that are extracted from literature with more detail as how each factor influence or affect green banking so that people get more awareness about these factors. The researches should also be

conducted in developed countries to see that how those economies tackle these hurdles. Techniques other than ISM and MICMAC should also be used for further researches.

6.5. Contribution of the study

This study will contribute to academia and research community as well as to the banking sector and regulators as it identified the barriers of green banking in Pakistan and also presented a structural model that also point out the key barriers that needed to be handled first. Moreover, it presented the MICMAC graph that provides the information about dependence and driving power in the aspect of clusters.

Table 15. Existing Barriers

Sr.	Source	Country	Focus	Variable	Method	Results
1	(Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B., 2022).	China	Identify the impact of green banking activities on green financing and banks' environmental performance	Insufficient awareness of customers, High investment costs, Technical obstacles, Lack of capable and well-trained staff, Difficulties and complexity in assessing green projects, Diversification issues, Credit risks, Reduction in banks' competitiveness in short terms, Operational self-insufficiency, Low demand for green credits/loans	Convenience sampling technique, SEM	Green banking activities exhibit a significantly positive effect on banks' environmental performance and sources of green financing
2	Khan, K. I., Mata, M. N., Martins, J., Nasir, A., Dantas, R. M., Correia, A. B., & Saghir, U. S., 2022).	Pakistan Portugal	Identify and quantify the barriers to adopting a green finance system	Poor communication with external stakeholders, Lack of employee training, Political instability, Knowledge about the "Green" concept, Lack of technical expertise, Uncertain economic condition, Lack of provision for government subsidies, Lack of interest in the banking sector, Insufficient research on the topic, Lack of pressure from global organizations, Lack of private sector involvement, Absence of regulatory body, High switching cost, Insufficient existing technological structure, Lack of globally available green criterion, Risk and process issues, Low return on investment as compared to the cost of green innovations, Unsupportive organizational structure	Interpretive Structural Modelling, MICMAC	Global level factors: lack of pressure from international organizations and unavailability of globally acceptable green criteria are critical to the prevalence of other factors that indicate its centrality to effectively implementing the green finance system.
3	(Qi, J., Paulet, E., & Eberhardt-Toth, E., 2021).	China	Difficulties associated with green credit implementation	Industry barriers ,Organizational barriers	Questionnaire survey	Different perceptions exist among managers of Chinese banks with different ownership structures and market shares
4	Ashiq, M. A., & Shahir, F.	Bangladesh	Identify the major challenges that Green Banking is facing in Bangladesh	Externalities, Maturity mismatch, Lack of clarity in green definitions, Information asymmetry, Lack of analytical capacities	Interview, Secondary data, Literature review	A strong working relation should be crafted between the public sector and private sector to achieve the fruits of Green Banking
5	RM, M. M. (2019).	India	Changing trends in Green Banking and the emerging challenges in introducing or implementing it in India	Online banking/Go-online, Paperless statements, Card based transactions, Use of renewable resources	Literature review, Survey method, Interview	Constructive discourse on Green Banking and its challenges

7. Conclusion

This study develops a structural model of the barriers of green banking in Pakistan by using ISM and MICMAC for analysis. This result of the study will help to understand which factors can become a barrier and what are the key barriers to green banking in Pakistan. The researcher has identified 30 factors in total through extensive literature conduct. The panel of 15 experts have verified 27 factors out of 30. The structural model also shows the contextual relationship between barriers. According to structural model of ISM, lack of internal capacity (19) is proved as the key barrier as it is at the lowest level of the model while lack of technology (25) and lack of formal guidelines (5) are declared the crucial barriers as they are at the bottom of the model.

According to MICMAC analysis, Autonomous factors are the one that are a bit disconnected from the system that means they have weak driving power and weak dependence power. But there few links can be strong sometimes.

The factors in this cluster are the weak factors as they have weak driving as well as weak dependence power. There were no factors in this cluster according to this study. Acceptability of card based transaction (12) fall in dependent cluster that means it have high dependence power but low driving power. Lack of awareness (1), lack of trained staff (2), higher operating cost (3), low profit (4), long startup time (6), low number of customers (7), lack of internal management support (8), lack of stakeholder's involvement (9), operational and market risk (10), lack of monitoring green banking practices (11), acceptability of paperless statement (13), lack of awareness about renewable resources (14), lack of employee interest (15), lack of support for environmental agencies (16), weak infrastructure (17), lack of support for green projects (18), lack of implementation of regulations (20), lack of performance indicators (22), lack of environmental experts (23), lack of public concerns (24) and lack of government interest (26) fall in linkage cluster that means they have high dependence power as well as high driving power. Lack of formal guidelines (5), lack of internal capacity (19), lack of capital cost (21), lack of technology (25) and lack of legal framework (27) fall in independent cluster that means they have strong driving power and weak dependence power. It helps to represent the key factors in a clear pattern and also the other factors are understandable in this manner according to the fact that which one of them have more effect on the other factors or which one is being affected by the others.

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Annexures

Sr.	Factors	Description	Yes/No
1	Lack of awareness	People are not well aware of the fact that how important green banking is	
2	Lack of trained staff	Technology used in green banking is new and staff is not able to handle it as they are not trained well	
3	Higher operating cost	Green banking needs high operating cost to train and educate	
4	Low Profit	The profits of green projects are lower than the polluting projects at initial stage	
5	Lack of formal Guidelines	There are no sector specific guidelines for green financing	
6	Long startup-time	Green projects/green banking takes a bit more time for startup as compared to the other projects	
7	Low number of customers	As customers are not well aware, they need just profit which is less in the case of green banking	
8	Lack of internal management support	As the management is mostly concerned with satisfying the stakeholders so if stakeholders are into profit, the management may take decisions just for the profit	
9	Lack of stakeholder's support	Stakeholders, for the sake of profit, do not support the green banking	
10	Lack of proper policies	There are no proper policies of green banking given by the government	
11	Operational and Market risk	There is an operational and market risk in green banking as people do not support such projects more that have less profit and a bit high cost	
12	Lack of monitoring green banking practices	There is no proper monitoring by authorities to check whether the practices are followed properly or not	
13	Lack of stakeholder involvement	Stakeholders are more interested in profits which are less in case of green banking	
14	Acceptability of card based transaction	Customers are not satisfied with the card base transaction as they believe more on the money in hand	
15	Acceptability of paperless statement	People are not satisfied with the paperless statements	
16	Lack of awareness about renewable sources	People and organizations are not well aware of the renewable sources that can be used rather than the non-renewable sources	
17	Lack of employee interest	Employees being rigid towards the new things are not interested in learning new practices or adopting	
18	Lack of support for environmental agencies	There are only few environmental agencies that work for such purposes but they are also not supported properly	
19	Weak infrastructure	The infrastructure of banks within the country is still weak	
20	Lack of support for green projects	Green projects are not much supported as these are not as profitable as the corporate projects	
21	Lack of internal capacity	The internal capacity of the country to do green projects is low due to which investors are not investing	
22	Lack of implementation of regulations	There is no implementation of the green banking regulations in banks	
23	Lack of capital cost	The strategies of green banking requires human resource and high financial cost	
24	Lack of performance indicator	No inner standard indicator or measurement framework for evaluating the environmental management level of borrowing firms as a reference	
25	Lack of environmental experts	There are not enough experts in green/environmental projects as much as in corporate projects	
26	Lack of public concerns	The public is not sensitive to environmental concerns	
27	Lack of resources	Resources such as capital, technology etc. are missing	
28	Lack of technology	Green banking concept requires the latest technology which is not present currently in the banks	
29	Lack of government interest	Frequent changes of personnel in the governing bodies handling international funds	
30	Lack of legal framework	There is no proper legal framework for green banking practices	