BINDURA UNIVERSITY OF SCIENCE EDUCATION

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KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) OF FAES STAFF AND STUDENTS TOWARDS THE BANNING OF COAL AS A SOURCE OF ENERGY IN DEVELOPING COUNTRIES

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE BACHELOR OF ENVIRONMENTAL SCIENCE HONOURS DEGREE IN SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT

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DECLARATION

To be compiled by the student

Registration number B192204B

I, Evina Mapanzure, declare that this work represents my original findings and has not been previously presented to any academic institution. Any reference to previously published work has been clearly indicated.

Signature of the student　　　　　　　　　　　　Date 24.06.2023

To be compiled by the supervisor

This dissertation is suitable for submission to the faculty and has been checked for conformity with the faculty guidelines.

Signature of the supervisor……………………………Date………………………

ABSTRACT

Background: The burning of coal as a source of energy has been identified as a major contributor to environmental pollution and climate change. As a result, there has been a global movement towards phasing out the use of coal in favour of cleaner energy sources. However, in developing countries where access to affordable energy is still a challenge, banning coal can have significant social and economic implications. This study aims to explore the perspectives of staff and students in the faculty of Agricultural and Environmental Sciences.

Materials and methods: A descriptive cross-sectional study was carried out and research questionnaires were used as data-collecting instruments. 70 research questionnaires were administered among the respondents. The questionnaire consisted of four sections: demographic characteristics, knowledge, attitude, and practices (KAP). **Data analysis:** Data were analysed using SPSS version 20 to generate frequencies on each KAP question. On each KAP question, the preferred response was assigned a score of 1 and unpreffered responses a score of 0. The total percentage KAP was calculated as total score/total possible*100%.

Results: The results showed that knowledge concerning the banning of coal was low (45%). The majority of the participants (99%) identified energy as a major use of coal in developing countries, while 80% recognized climate change as a potential environmental impact of coal usage. However, when it comes to knowledge of the intended banning of coal, only 67% of the participants had heard about it, and only 34% knew that the proposed year for the ban is 2030. The majority of participants (93%) agreed that developed countries should provide assistance to developing countries to transition to cleaner energy sources, and identified policies (23%), economic development (47%), and education and awareness (21%) as potential steps that developing countries could take to transition to cleaner energy sources.

The study found that 55% of participants had fair attitudes toward banning coal, but only 43% believed that developing countries should adopt this measure. Half of the participants believed that health risks associated with coal mining and burning justified a ban, but only 30% were willing to pay higher energy bills to support the transition to alternative sources of energy. Additionally, 66% believed that the ban would have negative economic impacts on developing countries. Despite this, 91% believed that developed countries had a responsibility to help developing countries transition to alternative sources of energy. Furthermore, 60% placed greater importance on the benefits of using coal than its environmental impacts. While 93% believed that individuals and organizations should reduce carbon emissions, only 23% identified policies as a means to enable the transition to alternative energy sources. Practices were fair with (51%) as most staff and students do not use coal for domestic purposes.

Relating: On the associations between demographic factors and attitudes towards banning coal significant relationships were found between age (χ^2=17.671, DF=8, p=0.024), sex (χ^2 = 74.866, df = 6, p < .001), education level (χ^2 = 17.671, df = 8, p = .024), marital status (χ^2 = 92.972, df = 9, p < .001), and residential area (χ^2 = 92.341, df = 12, p < .001) with support for banning coal. Education level was associated with year (χ^2 = 77.338, df = 6, p < .001) and steps to transition (χ^2 = 71.000, df = 3, p < .001) away from coal.

Conclusion: Knowledge was relatively low, attitude was fairly positive and practices were fairly positive.

Recommendations: These results suggest the need for increased education and awareness campaigns, as well as policy initiatives to incentivize the adoption of cleaner energy sources.
Key terms: coal banning, Knowledge, Attitudes, Practices, Bindura

DEDICATION
This study is dedicated to my family for their extraordinary love, care, and support.

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

IPCC   Intergovernmental Panel on Climate Change

UNFCCC   United Nations Framework Convention on Climate Change

IEA   International Energy Agency

EU   European Union

KAP   Knowledge, Attitudes, and Practices

FAES   Faculty of Agriculture and Environmental Science

CHAPTER 1: INTRODUCTION
1.1 BACKGROUND OF THE STUDY

Climate change is recorded as one of the greatest challenges faced by people in today's world, and it has been identifies that human activities, mainly the burning of fossil fuels, are the key cause (Masson-Delmotte, Zhai et al. 2021). The Paris Agreement of 2015, aims to maintain global warming to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C (Schleussner, Rogelj et al. 2016) . To keep the average global temperature from rising more than 2.7 degrees Fahrenheit or 1.5 degrees Celsius, , compared to preindustrial levels, there is need for wealthy countries to replace virtually all coal, gas and oil power plants with solar, nuclear power or wind by 2035, according to the International Energy Agency. And by 2040, all of the world's remaining coal plants would have to be closed or fitted with technology to capture their carbon emissions and bury them underground (Gielen, Gorini et al. 2021).

Coal has been accounting for 44 percent of global CO_2 emissions which has made it to be recorded as a major contributor to pollution and climate change (Mustafa, Ghazali et al. 2022). When coal is burned to generate electricity, it is 2.2 times as carbon intense as natural gas which means, burning coal emits more than twice as much carbon dioxide as natural gas to generate the equal amount of energy. Coal-fired thermal power plants release, nitrogen oxide, mercury particulate matter, and sulphur dioxide into the air and rivers, streams, and lakes (Gohlke, Thomas et al. 2011). These emissions not only degrade the environment but there is long-established evidence that they are also hazardous to human health. According to the International Agency (IEA) coal combustion accounted for 14% of the global CO_2 emissions after oil. Also, according to the British government medical reports it is estimated that 4,000 people died as a direct result of the Great Smog of London in 1952 that was caused by coal combustion and diesel exhaust (Finkelman, Wolfe et al. 2021).

The negative impacts from the use of coal have driven many countries to phase out its use as a source of energy and shift to the cleaner alternatives which include the use of nuclear power, natural gas, and renewable energy sources such as solar power, wind power, geothermal, hydropower, ocean thermal, bioenergy and hydrogen (Tobias Adrian, 2022).

However, coal is frequently used by developing countries as a cheap source of energy to run their economies (Roman Mendelevitch, 2019). This is especially true in Asia, where coal accounts for about half of the region's energy use. According to the IEA, developing

countries accounted for 80% of the increase in global coal consumption between 2000 and 2019 (Xia, Wang et al. 2021) . Coal is particularly attractive to developing countries because it is abundant, domestically available, and can be used for various purposes, including electricity generation, steel production, and cement manufacturing (Debiagi, Rocha et al. 2022). To phase out coal, these developing countries are likely to require outside financial help to wean themselves off coal, which has long been prized as a cheap source of energy for factories and homes.

The continuous use of coal has resulted in the significant health and environmental impacts. For example in china which is the largest consumer of coal globally, has been struggling with the severe air pollution problem for many years. To address this problem, the Chinese government declared war on air pollution and imposed strict regulations on coal-fired power plants in 2013, this helped in reducing air pollution levels in major cities (Tilt 2019) . Moreover, India, the second-largest consumer of coal globally, in major cities such as New Delhi, it is also reported to be facing serious air pollution problems. Regardless of the Indian government's support for the cleaner alternatives such as renewable energy and natural gas, coal still accounts for a significant portion of the country's energy mix (Isoaho, Goritz et al. 2017) .

The transition to the cleaner sources of energy is a complex issue that needs the involvement of different stakeholders which include the government, industries, customers and the environmental groups (Gawusu, Zhang et al. 2022) . The duty of each stakeholder in promoting the transition to the cleaner energy sources varies depending in their resources they have, interests in the transition and the power they have towards the transition. Governments play an important role in transitioning to cleaner energy sources by shaping energy policies and regulations and can also incentivise the transition to cleaner energy sources through the use of tax breaks, subsidies, and other policy instruments. Mostly those industries in the energy sector can influence the energy policies through their compliance efforts and the investments in clean energy technologies. Also, the customers can play a crucial role in promoting the shift to cleaner energy sources through their purchasing decisions and their demand for the clean energy products (Sebastian Rahbauer, 2016) . Environmental groups can advocate for strong and strict policies and regulations to promote the leaner energy sources and they can also raise awareness on the environmental and health impacts of coal.

Regardless of the growing awareness of the effects of coal and the need to transition to cleaner energy sources, the banning of coal as a source of energy in developing countries remains a argumentative issue (Brauers and Oei 2020) . Some stakeholders argue that coal banning could have economic impacts, especially in those countries where coal is a mostly used as source of energy and contributes to job creation and economic growth (Robinson, Blair et al. 2021) . Others argue that the adverse impacts of coal on the environment and health are greater than its economic benefits and that transitioning to cleaner energy sources can create new job opportunities and help in promoting sustainable economic growth.

Therefore, there is a need to investigate stakeholder perceptions of coal bans as a source of energy in developing countries in order to understand the drivers and barriers of coal bans and to identify potential areas of collaboration among stakeholders to promote the transition to cleaner energy sources. (Brauers and Oei 2020) . This study aims to provide a comprehensive overview of the current state of coal use in developing countries, as well as the challenges and opportunities associated with transitioning to cleaner energy source. It will also investigate the perspectives of various stakeholders, such as governments, industries, consumers, and environmental groups, on the prohibition of coal as a source of energy.

The project will take a qualitative approach in gathering data from stakeholders in developing nations through semi-structured interviews and focus group discussions. Representatives from government agencies, energy businesses, environmental organizations, and consumer groups will be included in the sample. The data collected will be analysed using thematic analysis to identify common themes and patterns in the perspectives of stakeholders.

The findings of this study will contribute to improvement of the current understanding of the problems and opportunities associated with transitioning away from coal as a source of electricity in developing countries. The study will provide insights into stakeholders' perspectives on the social, economic, and environmental effects of coal bans, as well as identify potential areas of collaboration among stakeholders to facilitate the transition to cleaner energy sources. The study will also highlight the need of understanding the varied viewpoints of stakeholders in developing nations in order to develop successful policies and strategies for the transition to cleaner energy sources.

All in all, the banning of coal as a source of energy is a major component of the transition to a low-carbon economy, and it is vital to understand the perspectives of stakeholders in developing nations on this subject. The study's findings will help to improve the current

understanding of the drivers and barriers to coal banning, as well as inform policy and strategy development for the transition to cleaner energy sources.

1.2 STATEMENT OF THE PROBLEM

The continual use coal as a source of energy has significant environmental, health and economic challenges. While the developed countries are transitioning from coal use to cleaner energy sources, the developing countries often depend on coal as a cheap source of energy to power their economies. The perspectives of the stakeholders which include the government, industry, civil society and academia, on the issue of coal banning as a source of energy in the developing countries have not been explored adequately. As a result, the problem addressed in this research is to understand the drivers and barriers of coal banning in the developing countries and to understand how the stakeholders perceive the potential impacts of such a move in the current year.

1.3 RESEARCH AIM
To assess the knowledge (what is known), attitude (what is thought), and relate knowledge of FAES students and staff towards the banning of coal as a source of energy in developing countries.

1.3.1 SECONDARY OBJECTIVES
1. To assess the knowledge of staff and students in the FAES towards the banning of coal as a source of energy in the developing countries.
2. To assess the attitude of students and staff in the FAES towards the banning of coal as a source of energy in the developing countries.
3. To identify current practices towards the banning of coal as a source of energy in developing countries.
4. To relate knowledge, attitudes and practices to social, economic and environmental factors of FAES staff and students towards banning of coal as a source of energy in the developing countries.

1.4 RESEARCH QUESTIONS
1. What knowledge do the FAES staff and students have with regards to coal banning in developing countries?
2. What is the general attitude of FAES staff and students have towards the banning of coal in the developing countries?

3. What are the practices by FAES staff and students towards the banning of coal as a source of energy in the developing countries?

4. What is the relationship between KAP and socio-economic variables?

1.6 LIMITATIONS OF THE STUDY

The developing countries often have the limited resources like data and research material which can make it difficult to conduct a comprehensive study.

It can take a long time to conduct a comprehensive study on a complex issue such as banning coal as a source of energy in developing countries therefore the time constraints of a dissertation may not be adequate to allow for a comprehensive analysis of all aspects of the issue.

Due to the different cultures and languages on the stakeholders it can be difficult to accurately assess the opinions of all the stakeholders because they may have different opinions on the issue.

Since data were collected by self-administered questionnaire, there might be response bias.

2 LITERATURE REVIEW

2.1 INTRODUCTION

The banning of coal as a source of energy in developing countries is a highly controversial topic. Stakeholders' perspectives on this topic have been the focus of many studies, as they provide valuable insight into the potential impacts of such a move. This literature review will explore the existing research on stakeholder perspectives of the banning of coal as a source of energy in developing countries(Kalghatgi, 2020). In many developing countries, health impacts and local air quality concerns have driven calls for the use of clean sources of energy.

Table 1: Review 0f empirical studies

STUDIES	KEY FINDINGS	REFERENCES
Stakeholder Perspectives on the Energy Transition in China	**Knowledge:** This study found out that the average score was 70% of the participants (Khanam and Reiner 2022). According to a survey which was conducted in China, Energy Fund Committee in 2020, around 70% of the respondents were aware of the global efforts to reduce the use of coal as a source of energy.	(Khanam and Reiner 2022)
	From this research 94% of the participants were aware of the negative impacts of coal use and identified air pollution and greenhouse gas emission as the major impacts	(Zhang, Mauzerall et al. 2010)
	Around 80% of the respondents were aware of the alternatives that can replace coal, such as wind, solar, and nuclear power. The survey also found that around 87% of the respondents supported the development of renewable energy in China.	
	The results obtained from the study shows that the alternatives that were mentioned to replace coal were (hydropower: 80%, solar: 80%)	(Sun, Zhang et al. 2016)
	Attitude: China had 55% average attitude score towards coal banning as a source of energy.	(Wu, Zheng et al. 2020).
	Study conducted in China on the Inclusion of Renewable Energy Sources in Municipal Environmental Policy shows that 60% of urban residents supported a ban on coal-fired power plants in urban areas, 20% of urban residents supported a nationwide ban on coal and 36% of rural residents supported a ban on coal-fired power plants in rural areas	(Jeleński, Dendys et al. 2021).
	Study conducted in China from the study does government involvement and awareness of benefit affect China's willingness to pay for renewable green electricity where 70% of urban residents and 62% of rural residents supported the development of renewable energy sources	(Nketiah, Song et al. 2022)
	In China 71% of respondents disagreed that the benefits of using coal were more than its impacts on the environment.	(Bird, Haynes et al. 2014).
	Practices: The study found that some stakeholders had taken actions to reduce their reliance on	

	coal, such as investing in solar panels and advocating for policy change. Specifically, 34% of participants had invested in solar panels, 27% had advocated for policy change, and 16% had engaged in community-level initiatives to promote renewable energy. However, the study also found that many stakeholders faced challenges in implementing renewable energy initiatives, such as lack of government support and limited access to financing.	
Study on stakeholders' knowledge of the negative impacts of coal in India	**Knowledge:** From this study, the results showed that knowledge concerning the banning of coal was low (45%). The study by Bhandari et al. (2020) found that stakeholders had a high level of knowledge about the negative impacts of coal, with 87% of participants identifying air pollution and greenhouse gas emissions as the key negative consequences of coal use, indicating a growing recognition of the importance of transitioning towards renewable energy alternatives. The study found that 68.6% of participants were aware of the need for India to transition to cleaner sources of energy, indicating a growing awareness of the need for a shift away from coal. A significant proportion of participants, 64.3%, were aware of the proposed timeline for phasing out coal in India, indicating that there is some awareness of government policies aimed at reducing coal use. The study found out that a majority of participants, 70.5%, believed that renewable energy sources could replace coal in India, highlighting the importance of public support for the transition towards cleaner sources of energy. Finally, the study by found that a significant proportion of participants, 76.4%, had some level of knowledge regarding the various steps required to transition to cleaner sources of energy in India, suggesting that there is a growing recognition of the need for a comprehensive approach to the transition towards renewable energy alternatives. The study carried out in India on stakeholders perceptions towards coal banning as a source of energy where the results were (wind: 31%, hydropower: 62%, solar: 67%)	Bhandari et al. (2020) (Munawer 2018) Ahmad et al. (2019) Kumar et al. (2019) Singh et al. (2021)
	Attitude: According to this study, India had the average attitude score of 84% India with 57% of respondents who supported a shift away from coal towards renewable energy sources India, where 74% of those sampled agreed that the health risks associated with coal mining and burning justified a ban on coal as a source of energy Study conducted in India from the study a just energy transition in Delhi on addressing the bias	(Hoerster, Chrisler et al. 2003). (Sharma, Greig et al. 2021). (Srisawasdi, Tsusaka et al. 2021). (Dua, Hardman et al. 2021, Dutt and Ranjan 2022)

	in the rooftop solar market, 84% of respondents believed that the transition to renewable energy was feasible for India. In India on the study social acceptance of renewable energy projects, where 85% of respondents were willing to pay higher energy bills to support the transition to renewable energy The results from India on the study International Attitudes Towards Climate Policies 57% of respondents believed that a ban on coal would have a negative economic impact on India	(Paravantis, Stigka et al. 2018). (Pianta, Rinscheid et al. 2021).
	Practice: Bhandari et al. (2020) found that stakeholders were engaged in community-level initiatives to promote renewable energy, such as village-level solar projects. Specifically, 61% of participants reported being involved in such initiatives. However, the study also found that stakeholders faced challenges in implementing renewable energy initiatives, such as grid connectivity issues and limited technical capacity.	
Stakeholder perspectives on coal use and transition to renewable energy in Indonesia	**Knowledge:** Banning of coal as a source of energy in the developing world: According to a survey conducted by the Center for International Forestry Research (CIFOR) in Indonesia in 2019, around 58% of the respondents were aware of the global efforts to reduce the use of coal as a source of energy. Effects of coal as a source of energy: According to a survey conducted by the Indonesian Ministry of Environment and Forestry in 2018, around 92% of the respondents were aware of the negative effects of coal as a source of energy, such as air pollution and climate change. Alternatives that can replace coal: According to a survey conducted by the Indonesian Institute for Energy Economics in 2019, around 68% of the respondents were aware of the alternatives that can replace coal, such as solar, wind, and hydro power. The survey also found that around 90% of the respondents supported the development of renewable energy in Indonesia.	Li et al. (2020)
	Attitude: Li et al. (2020) conducted a study on stakeholders' attitudes towards coal banning in Indonesia. The study found that stakeholders were generally supportive of renewable energy alternatives, with 62% of participants indicating that they would support a policy that prioritizes renewable energy over coal. However, the study also found that there was concern about the economic impacts of a coal ban, with 38% of participants indicating that they were uncertain about such a policy.	
	Practice: The study found that stakeholders were engaged in community-level initiatives to	

	promote renewable energy, such as wind turbine installations. Specifically, 39% of participants reported being involved in such initiatives. However, the study also found that stakeholders faced challenges in implementing renewable energy initiatives, such as limited access to financing and technical capacity.	
Stakeholder perspectives on coal use and transition to renewable energy in Greece.	**Knowledge:** Banning of coal as a source of energy in the developing world: There is currently no available data on the percentage of the Greek population who are aware of the global efforts to reduce the use of coal as a source of energy, including the specific policies and initiatives to phase out coal in developing countries. Effects of coal as a source of energy: According to a survey conducted by the European Commission in 2019, around 80% of the Greeks surveyed were aware of the negative effects of fossil fuels, including coal, on the environment and health. However, it is unclear how many specifically understood the impact of coal as a source of energy.	Korkovelos et al. (2020)
	Attitude: The study found that stakeholders were generally supportive of renewable energy alternatives, with 81% of participants indicating that they would support a policy that prioritizes renewable energy over coal. The study also found that only 7% of participants were opposed to such a policy, indicating that stakeholders in Greece are generally supportive of transitioning away from coal as a source of energy.	(Furmankiewicz, Hewitt et al. 2021)
	Practice: The study found that stakeholders were engaged in community-level initiatives to promote renewable energy, such as solar panel installations. Specifically, 23% of participants reported being involved in such initiatives. The study also found that stakeholders faced challenges in implementing renewable energy initiatives, such as limited access to financing and lack of government support.	

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous Chapter relevant literature related to KAP regarding coal banning was reviewed. This chapter outlines the research area, tools, and techniques that were used to assess the KAP (Knowledge, Attitudes and Practices) of Bindura University FAES staff and students. The study design, the people with particular expertise, the sample size, and the sampling techniques are all outlined. The chapter proceeds by outlining the study tools; research reliability; research validity; research ethics; and finally, data analysis techniques.

3.2 DESCRIPTION OF STUDY AREA

The study was conducted at the Astra Campus of the Bindura University of Science Education, which is located in the Mashonaland Central Province. The region has an average annual temperature range of 24°C during the summer and a low temperature range during the winter, with an average temperature of 32°C. The average annual rainfall in the area is 847mm. The ecological region in which the campus is located is Region Two, with an annual average temperature of 19.8°C. The highest temperature recorded in the region is 27.2°C, and the lowest is 12.4°C. The Astra Campus receives an annual precipitation of 840mm. The region is characterized by perennial rivers, and the highest discharge rate has been recorded in these rivers.

Figure 1 **:** *Astra campus study area map.*
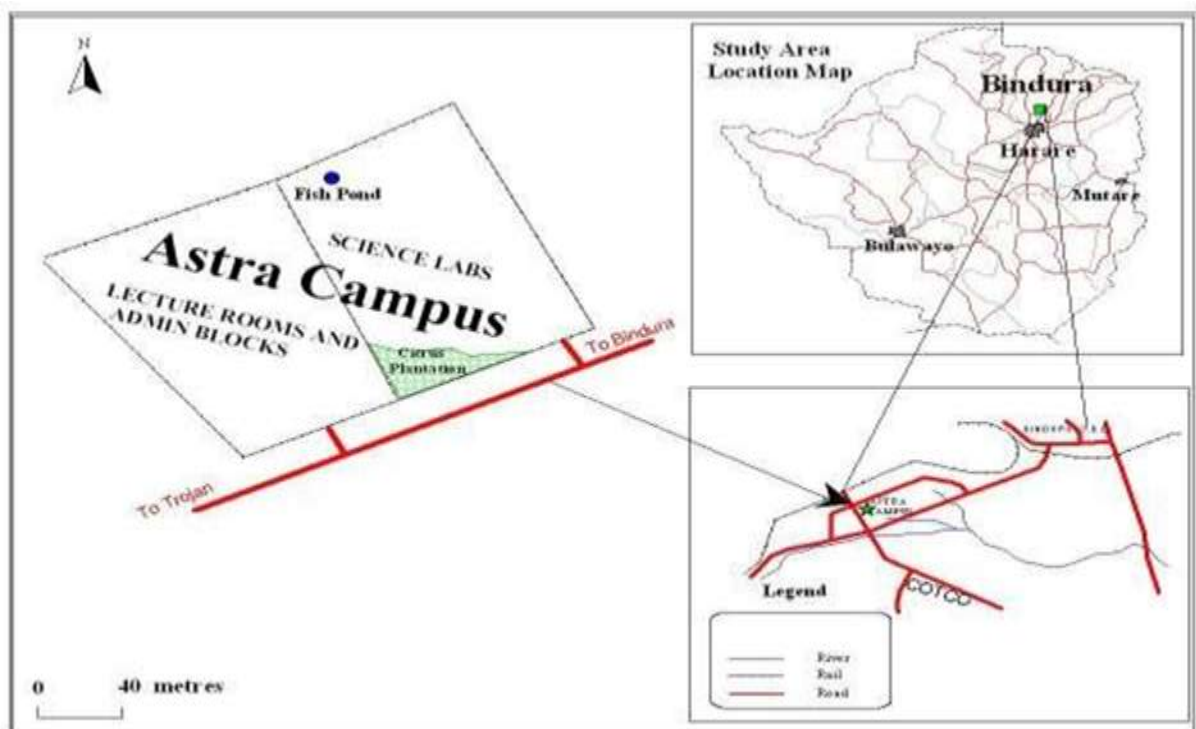
3.3 STUDY DESIGN

The researcher employed a cross-sectional study design, using a survey questionnaire to collect data from a purposive and convenience sample of FAES staff and students. The survey questionnaire was designed to explore stakeholder perspectives on coal banning as a source of energy in developing countries, including their knowledge about the adverse environmental, health, and economic impacts of coal use, as well as their attitudes and practices related to coal use and the transition to cleaner energy sources.

3.4 DATA SOURCES

Primary and secondary sources of data were used in the study. The participants at FAES served as the major sources of data whilst the majority of the secondary sources of data were journals. The survey also incorporated secondary data from other significant sources. E-Journals were heavily utilized throughout the research, serving as the main foundation for the literature review.

3.5 SAMPLING METHOD AND SAMPLE SIZE

The study was conducted at the FAES campus, which consists of five departments: environmental science, natural resources, animal science, crop science and agricultural economics, education, and extension. The researcher employed a convenience sampling method to recruit participants who were readily available and willing to participate in the study. The sample size was determined based on the feasibility of data collection and the resources available for the study. A total of 70 participants were recruited, which was deemed appropriate for the research question and provided sufficient power to detect meaningful differences in knowledge, attitudes, and practices related to coal banning as a source of energy in developing countries within each department. To ensure that the sample was representative of the diverse academic disciplines within the university, the researcher recruited participants from all five departments and aimed to include individuals with a range of educational levels, from undergraduate students to faculty members. While the sampling method used in this study had some limitations, such as the potential for selection bias and lack of generalizability to other universities or contexts, the researcher attempted to minimize these limitations by using a convenience sampling method that allowed for a diverse range of participants to be included. All in all, the sample size and sampling method used in this study were appropriate for the research question and provided valuable insights into the perspectives of stakeholders in various academic disciplines regarding the banning of coal as a source of energy in developing countries.

3.6 RESEARCH TOOLS

The researcher used a questionnaire as the primary research tool to collect data from participants. The questionnaire was designed to explore stakeholder knowledge, attitudes, and practices regarding coal banning as a source of energy in developing countries. The questionnaire consisted of three main sections which are the demographic information which collected information about the participants' age, gender, academic discipline, and level of education, the knowledge Section which focused on the participants' knowledge of coal use and the potential impacts of coal use on the environment, health, and economy, as well as their knowledge of cleaner energy sources, the attitudes Section which explored the participants' attitudes towards coal banning as a source of energy in the developing countries including their support for coal banning, and the last section is the practices section which explored the practices related to coal use and the transition to cleaner energy sources and their engagement in practices to promote cleaner energy sources.

The questionnaire was distributed to participants via email and as hard copies. Participants were given instructions on how to complete the questionnaire, and were informed that their participation was voluntary and anonymous. The questionnaire was designed to be simple and easy to understand, with clear and concise questions.

3.7 RELIABILITY AND VALIDITY OF RESEARCH INSTRUMENTS

To improve validity and reliability of the data collected, the researcher pilot-tested the questionnaire with a small sample of 10 participants before running the actual survey to determine whether they were comprehensible or not to the respondents and to also ensure that only relevant information was incorporated in the questionnaire.

3.8 ETHICAL CONSIDERATIONS

The study complies with the core principles set forth in the Helsinki declaration when it comes to using humans or animals in research. With the assistance of the Supervisor and the FAES Chairperson, the researcher was given authorization to carry out the research. The researcher thoroughly discussed the study's objectives and methods and also obtained informed consent from participants verbally. When collecting data, the researcher always attempted to maintain confidentiality. The researcher did not arbitrarily and unjustly disqualify certain study participants according to their race, color, ethnicity, or socioeconomic standing. Participants voluntarily participated in the study as the researcher made sure that no person was forced or deceived to participate in the study but to provide data needed willingly. In addition, the researcher explained to the participants that they had

the right to withdraw from the study anytime without having to give explanations or facing any consequences. The researcher made sure that the answers provided did not capture their names and addresses to guarantee anonymity on the data collection tool. The researcher did not exclude certain participants from a study unjustly and unfairly on the basis of race, color, ethnic group or social status.

3.9 STATISTICAL ANALYSIS

The data were analyzed using descriptive statistics, including percentages and frequencies. The researcher used inferential statistics, such as chi-square tests, to examine the relationship between knowledge, attitudes, and practices related to coal banning as a source of energy in developing countries to social economic variables. To compute percentage KAP, scores were calculated for each KAP question. A score of 1 was assigned to each correct response and 0 was assigned to each incorrect response.

3.10 CONCLUSION

This chapter has provided an overview of the methodology used in data collection for the dissertation on stakeholders' perspectives on the banning of coal in developing countries. The mixed-methods approach used in this study combines both quantitative and qualitative data collection methods to provide a comprehensive understanding of stakeholders' knowledge, attitudes, and practices related to coal banning. The data analysis techniques used in this study will provide valuable insights into stakeholders' perspectives on this important issue, which can inform policy and `decision-making related to the transition towards renewable energy alternatives.

CHAPTER 4: RESULTS
4.1 INTRODUCTION

This chapter focuses on the data presentations and the analysis of the findings of the research

project. Tables were used to present the data.

4.2 SECTION A DEMOGRAPHY
Table 2: summary of demographic characteristics

Demographic Variable	Category	N=70	%=100
Sex	Male	45	64
	Female	25	36
Age	18-25	37	53
	26-33	16	23
	34-41	8	11
	42-49	5	7
	50+	4	6
Residential location	High density	13	19
	Medium density	18	26
	Low density	37	53
Marital Status	Married	24	34
	Single	43	61
	Divorced	3	4
Household position	Father	19	27
	Mother	12	17
	Son	23	33
	Daughter	12	17
Highest education level	Primary	3	4
	Secondary	22	31
	Tertiary	45	64
Employment status	Unemployed	38	54
	Employed	32	46

A total of 70 respondents completed the survey with the majority of the participants being the males (64%) and 36% being the female. In terms of age, the majority of the respondents (53%) were between the ages of 18-25, followed by the age between the table ages of 26-33 (23%), those who were between the ages of 34-41 (11%) and the remaining 16% were split between those aged 42-49 (7%) and those aged 50 and above (6%). In terms of residential location of the respondents at FAES Campus, the majority of them (53%) lived in high density areas, while 26% lived in medium density areas and 19% lived in low density areas. With regards to marital status, the majority of the respondents (61%) were single, followed by 34% who were married, and 4% who were divorced with the highest proportion of respondents (33%) being identified as sons, followed by fathers (27%), daughters (17%), and mothers (17%). The highest level of education attained by the majority of the respondents (64%) was tertiary education, followed by secondary education (31%) and primary education (4%). With regards to employment status, 54% of the respondents were unemployed while 46% were employed.

4.3 SECTION B: KNOWLEDGE OF BINDURA FAES STAFF AND STUDENTS ON COAL BANNING AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

Table 3: knowledge on coal banning

	Participant response	N	%	Score
K1. What are the major uses of coal in the developing countries	Energy	70	99	**0.99**
	Fuel	22	31	**0.31**
	Asphalt	4	6	**0.06**
K2. What are the possible environmental impacts of coal usage on the environment?	Climate change	56	80	**0.80**
	Death	39	56	**0.56**
	Biodiversity loss	15	21	**0.21**
	Malnutrition	10	14	**0.14**
K3. Have you heard about the intended	Yes	47	67	**0.67**

banning of coal as a source of energy?				
K4. By which year is it proposed to ban coal?	2030	24	34	**0.34**
K5. What are the alternative energy sources that can replace coal in developing countries?	Wind	24	34	**0.34**
	Hydropower	46	66	**0.66**
	Solar	47	67	**0.67**
	Gas	27	39	**0.39**
K6. Do you think developed countries should provide assistance to developing countries to transition to cleaner energy sources?	Yes	65	93	**0.93**
K7. What steps do you think developing countries should take to transition to cleaner energy sources?	Policies	16	23	**0.23**
	Economic development	33	47	**0.47**
	Education and awareness	15	21	**0.21**

Table 3 illustrates the level of knowledge of the respondents have towards coal banning as a source of energy in the developing countries. The total knowledge score was 7.73 and so the total percentage positive knowledge was 45% calculated as total score/total possible score*100%. Based on the participant responses. The majority of the participants (99%) identified energy as a major use of coal in developing countries, while 80% recognized climate change as a potential environmental impact of coal usage. When it comes to

knowledge to the intended banning of coal as a source of energy, only 67% of the participants had heard about it, and only 34% knew that the proposed year for the ban. Relating to the alternative energy sources, the majority of the participants identified wind (34%), hydropower (66%), solar (607%), and gas (39%) as potential replacements for coal in developing countries. The majority of participants (93%) agreed that developed countries should provide assistance to developing countries to transition to cleaner energy sources, and identified policies (23%), economic development (47%), and education and awareness (21%) as potential steps that developing countries could take to transition to cleaner energy sources.

4.4 ATTITUDES OF STAFF AND STUDENTS ON TOWARDS COAL BANNING AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

Table 4: attitude towards coal banning

ATTITUDE VARIANCE	Participant response	N	%	SCORE
A1. Do you support the banning of coal as a source of energy in developing countries?	Yes	30	43	**0.43**
A2. Do you believe that the health risks associated with coal mining and burning justify a ban on coal as a source of energy?	Yes	35	50	**0.50**
A3. Do you think the transition to alternative sources of energy would be feasible for developing countries?	Yes	34	49	**0.49**
A4. Would you be willing to pay higher energy bills to support the transition to alternative sources of energy?	Yes	21	30	**0.30**
A5. Do you believe the banning of coal would have a negative economic impact on developing countries?	Yes	46	66	**0.66**
A6. Do you think that developed countries have a responsibility to help developing countries transition to alternative sources of energy?	Yes	64	91	**0.91**

A7. Do you think the benefits of using coal are more than its impacts on the environment?	Yes	42	60	**0.60**
A8. What measures do you think should be put in place to ensure a successful transition away from coal in developing countries?	Economic development	35	50	**0.50**
	Regulations	39	56	**0.56**
	Policies	16	23	**0.23**
	Increase coat of purchasing coal	9	13	**0.13**
A8. How important do you think it is for individuals and organizations to take action towards reducing global carbon emissions?	Important	65	93	**0.93**
A9. What role do you think universities can play in supporting the transition to cleaner energy sources in developing countries?	Research	61	87	**0.87**

From table above average attitude score was 7.11 divided by 13 questions meaning 0.55 and 55% when converted to percentages which is moderate. According to the table above, 43% of participants responded affirmatively on the support for banning coal as a source of energy in developing countries. Similarly, 50% of participants believed that the health risks associated with coal mining and burning justified a ban on coal as a source of energy, and 49% believed that the transition to alternative sources of energy would be feasible for developing countries. However, only 30% of participants were willing to pay higher energy bills to support the transition to alternative sources of energy, and 66% believed that the banning of coal would have a negative economic impact on developing countries. The majority of participants (91%) believed that developed countries have a responsibility to help developing countries transition to alternative sources of energy, and 60% believed that the benefits of using coal are more important than its impacts on the environment. When asked about the measures that

should be put in place to ensure a successful transition away from coal in developing countries, the majority of participants identified economic development (50%), regulations (56%), and policies (23%). The majority of participants (93%) believed that it is important for individuals and organizations to take action towards reducing global carbon emissions. Regarding the role that universities can play in supporting the transition to cleaner energy sources in developing countries, the majority of participants (87%) believed that research is an important role for universities to play.

4.5 SECTION D. PRACTICES BY BINDURA UNIVERSITY STAFF AND STUDENTS ON THE TOPIC COAL BANNING AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

Table 5: practices towards coal banning

Practice Variable	Participant response	N	%	Score
P1. Do you use coal for domestic or business purposes?	No	30	43	**0.43**
P2. Do you support the banning of coal as an energy source?	Yes	31	44	**0.44**

Table 5 shows that the average score of practices towards coal banning as a source of energy was 1.01 out of 2 which make up 51%%. The average score is quite neutral. The data shows that a majority of Bindura University staff and students do not use coal for domestic or business purposes (57%), and that 44% of participants support the banning of coal as an energy source.

SECTION 4.6. RELATING KNOWLEDGE, ATTITUDES AND PRACTICES TO SOCIAL, ECONOMIC AND ENVIRONMENTAL FACTORS OF FAES STAFF AND STUDENTS TOWARDS BANNING OF COAL AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES.

Age and support coal banning

There was a relationship between age and support for coal banning (χ^2=17.671, DF=8, p=0.024). The 18-25 group support the banning of coal significantly more than other groups.

Sex and support for coal banning

The test result shows that there is a significant association between sex and support for banning coal, based on both the Pearson chi-square test (χ^2 = 74.866, df = 6, p < .001) with more male supporting than female

Education level and support banning of coal

The test result shows people who had reached tertiary level were more supportive on the issue of coal banning than those of secondary and primary education and it shows a significant association between education level and support for banning coal, based on both the Pearson chi-square test (χ^2 = 17.671, df = 8, p = .024)

Education level and year of coal banning

The test result shows that there is a significant association between education level and year, based on both the Pearson chi-square test (χ^2 = 77.338, df = 6, p < .001) with more people who had reached tertiary knowing the globally proposed year of coal ban than those who only reached secondary and primary level .

Age and year of coal banning

The test result shows that the age group (18-25) were more aware of the proposed year of coal ban than other age groups and also shows that there is a marginally significant association between age and year of coal banning, based on the Pearson chi-square test (χ^2 = 9.111, df = 4, p = .058)

Education level and steps to transition

The test result shows that there is a significant association between education level and steps to transition, based on both the Pearson chi-square test (χ^2 = 71.000, df = 3, p < .001). People who had reached tertiary level new most the steps to transitioning away from the use of coal to cleaner energy sources.

Marital status and support banning of coal

The test result shows that there is a significant association between marital status and support for banning coal, based on both the Pearson chi-square test (χ^2 = 92.972, df = 9, p < .001). Single people were more supportive on the issue of coal banning than the married and divorced.

Residential area and support banning of coal

The test result shows that there is a significant association between residential area and support for banning coal, based on both the Pearson chi-square test (χ^2 = 92.341, df = 12, p <

.001). People from high density were more supportive to the issue of coal ban than those of low density and medium density residential locations.

CHAPTER 5: DISCUSION
5.1 KNOWLEDGE TOWARDS THE BANNING OF COAL AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

From this study, the results showed that knowledge concerning the banning of coal was low (45%). The results of this study was lower than the research carried out in China on the KAP on coal banning where 70% was their average knowledge score (Khanam and Reiner 2022). Indonesia had 58%. The inconsistency in these studies may be caused by the variation in the level of education and awareness-raising efforts in different countries. The controversy in these studies may be caused by the variation in the level of education and awareness-raising efforts in different countries. The Bindura FAES staff and students may have had less exposure to education and awareness-raising efforts on the negative impacts of coal usage and the benefits of renewable energy sources compared to stakeholders in other countries where such efforts are more widespread.

Table 2 reveals that the percentage of participants who were aware of the negative effects of coal as a source of energy at Bindura University was (80%). The results were consistent with results from the research which was done in China where 94% of the participants were aware of the negative impacts of coal use and identified air pollution and greenhouse gas emission as the major impacts (Zhang, Mauzerall et al. 2010) and consistent with India with 87 % of the participants being aware of the negative impacts of coal and identified air pollution and greenhouse gas emission as the negative impacts of coal (Munawer 2018). The results were also consistent with the findings from Greece with 80% participants being aware of the negative impacts of coal and consistent with the results from Indonesia with 92% indicating air pollution and climate as the significant effects of coal use(Strasert, Teh et al. 2019). The results shows high levels of awareness in the research done at Bindura and also the studies conducted in China, India, Indonesia and Greece regarding the negative impacts of coal use. This may be because air pollution and climate change are the global issues that have been widely covered in the media and public discourse, which could have been the reason for the rise in the awareness levels of the participants in these different studies. Also, the high levels of awareness could also be because the participants of these studies are mostly students or the academics who are likely to be engaged with environmental issues and sustainability, like the

study done at Bindura University which only focused on the staff and students of the Faculty of Agriculture and Environmental Sciences.

From the study 67% of the total participants knew about the intended banning of coal as a source of energy. Also, it was found that less than half of the participants at Bindura University at FAES Campus 34% knew about the proposed year for the banning of coal as a source of energy. This is consistent with the study which was carried out in India on perspectives on the energy transition with 64% who knew about the proposed timeline to phase out coal (Diluiso, Walk et al. 2021). The level of knowledge on the intended year to ban coal on Bindura is lower than that in India. This could be due to the level of media coverage and public discourse around the proposed coal phase-out timeline, like in India, the government has made public announcements concerning the plans to phase out coal which may have received wider media coverage and attention compared to Zimbabwe. Also, a study conducted in India may have may have included more diverse sample of the participants including individuals from different socio-economic background and regions of the country which could have influenced awareness unlike the study conducted at Bindura which only focused on the staff and students of FAES Campus only.

In the study, it was found that the percentage of participants who identified renewable energy sources like wind, hydropower, and solar as potential replacements for coal in developing countries in Bindura University was (34%, 66%, 67%) respectively. This is consistent with the study carried out in India on stakeholders perceptions towards coal banning as a source of energy where the results were (wind: 31%, hydropower: 62%, solar: 67%) and also consistent with the results from Indonesia where the results were (hydropower: 68%, solar: 68%) on the stakeholders perceptions on the banning of coal as a source of energy (Mori 2020). The study was inconsistent with the results obtained from the study done in China on knowledge, attitude and practice of the stakeholders on coal banning as a source of energy (hydropower: 80%, solar: 80%). The differences in results could be due to the methodology used in the studies. The questions used to assess the stakeholders perceptions of renewable energy sources way have been worded differently in various studies which could have affected the responses of the participants.

5.2 ATTITUDE TOWARDS THE BANNING OF THE USE OF COAL AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

From the study, the respondents had average attitude score of 55% which is fair on coal banning as a source of energy in the developing countries. The results were consistent with

the results from china with 55% average attitude score towards coal banning as a source of energy (Wu, Zheng et al. 2020). The results of this study was lower than the research carried out in India with the average attitude of 84% from the study was lower than the average attitude of Indian participants (Hoerster, Chrisler et al. 2003). The results from the study carried out at FAES was higher than that carried out in in Indonesia on KAP of stakeholders on coal banning as a source of energy, which had mixed attitudes towards a coal ban, with 38% of participants concerned about the economic impacts of such a policy (Trencher, Healy et al. 2019).

On the support banning of coal as a source of energy in developing countries less than half of the participants (43%) of Bindura FAES campus were supportive. The results were lower than those of the study conducted in China on the Inclusion of Renewable Energy Sources in Municipal Environmental Policy where 60% of urban residents supported a ban on coal-fired power plants in urban areas, 20% of urban residents supported a nationwide ban on coal and 36% of rural residents supported a ban on coal-fired power plants in rural areas (Jeleński, Dendys et al. 2021). The results from this study were also lower than those of the study carried out in India with 57% of respondents who supported a shift away from coal towards renewable energy sources (Sharma, Greig et al. 2021).

According to table 4, 50% of the participants believed that the health risks associated with coal mining and burning justify a ban on coal as a source of energy. The results were lower than the study conducted in India, where 74% of those sampled agreed that the health risks associated with coal mining and burning justified a ban on coal as a source of energy (Srisawasdi, Tsusaka et al. 2021).

From the study, less than half of the participants (49%) believed that the transition to alternative sources of energy would be feasible for developing countries. These results were lower than those of the study conducted in China from the study does government involvement and awareness of benefit affect China's willingness to pay for renewable green electricity where 70% of urban residents and 62% of rural residents supported the development of renewable energy sources (Nketiah, Song et al. 2022). The results were also lower than those of the study conducted in India from the study a just energy transition in Delhi on addressing the bias in the rooftop solar market, 84% of respondents believed that the transition to renewable energy was feasible for India (Dua, Hardman et al. 2021, Dutt and Ranjan 2022).

Table 4 revealed that only 30% of the respondents from this study were willing to pay higher energy bills to support the transition to alternative sources of energy. The results were inconsistent with the findings which was done in India on the study social acceptance of renewable energy projects, where 85% of respondents were willing to pay higher energy bills to support the transition to renewable energy (Paravantis, Stigka et al. 2018).

From this study, 66% of the participants believed that the banning of coal would have a negative economic impact on developing countries the results were consistent with the results from India on the study International Attitudes Towards Climate Policies where 57% of respondents believed that a ban on coal would have a negative economic impact on India (Pianta, Rinscheid et al. 2021).

Table 4 shows that 60% of the respondents believed that the benefits of using coal are more than its impacts on the environment. The results from this study were consistent with the results from China on the study, public perspective of carbon capture and storage for CO_2 emission reductions in China where 71% of respondents disagreed that the benefits of using coal were more than its impacts on the environment (Bird, Haynes et al. 2014).

The differences in the attitudes on the participants towards coal banning as a source of energy could have been triggered by the differences in the level of awareness and understanding of the negative impacts of coal usage and the benefits of transitioning to renewable energy sources. Participants in countries where there is greater awareness and understanding of the negative impacts of coal usage and the benefits of renewable energy sources may have more positive attitudes towards coal banning as a source of energy. Also, differences in the political and economic contexts of the various countries could also contribute to the differences in results. For example, in countries where there is greater economic dependence on the coal industry, stakeholders may have more mixed attitudes towards coal banning as a source of energy due to concerns about the economic impacts of such policies.

5.3 PRACTICES TOWARDS THE BANNING OF THE USE OF COAL AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES

According to table 5, the average practice score for participants was 51%which was relatively neutral towards banning coal as a source of energy in developing countries. This is lower than the percentage of stakeholders in India (84%)on the study stakeholders perceptions towards coal banning as a source of energy (Bhushan, Banerjee et al. 2020) and Greece had (81%) average practise towards coal banning on the study stakeholders perceptions towards coal banning as a source of energy (Karamaneas, Koasidis et al. 2023) which is higher than the

results from this study on people who were supportive of renewable energy alternatives and the percentage of stakeholders in Indonesia who indicated support for a policy that prioritizes renewable energy over coal was 62% (Atteridge, Aung et al. 2018).

From table 5, the results shows that a majority of Bindura University staff and students do not use coal for domestic or business purposes (57%). The results were consistent with the results from India by Bhandari et al. who found that a majority of participants were engaged in community-level initiatives to promote renewable energy, specifically through village-level solar projects with percentage of participation (61%) (Boateng 2016). The results from this study were inconsistent with the results from Indonesia where there was a smaller percentage of participants (23%) who were involved in community-level initiatives to promote renewable energy, such as solar panel installations (Guerreiro and Botetzagias 2018).

The differences in the results from these studies could be due to the differences in the availability and accessibility of renewable energy alternatives in the various countries could also contribute to the differences in results. Participants in countries where renewable energy alternatives are more available and accessible may be more likely to use them and engage in community-level initiatives to promote them. Also, the differences in the political and economic contexts of the various countries could also contribute to the differences in results. For example, in countries where there is greater government support and incentives for renewable energy, stakeholders may be more likely to use renewable energy alternatives and engage in community-level initiatives to promote them.

5.4 RELATING KNOWLEDGE, ATTITUDES AND PRACTICES TO SOCIAL, ECONOMIC AND ENVIRONMENTAL FACTORS OF FAES STAFF AND STUDENTS TOWARDS BANNING OF COAL AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES.

Age and Support for Banning Coal

In the study, it is found that there was significant relationship between age and support for banning coal (χ^2=17.671, DF=8, p=0.024). Specifically, the 18-25 age group expressed significantly more support for banning coal than other age groups. One possible reason for this result could be that younger individuals tend to be more environmentally conscious and are more likely to support sustainable practices.

Sex and Support for Banning Coal

The analysis revealed a significant association between sex and support for banning coal, (χ^2 = 74.866, df = 6, p < .001). The results suggest that women are more likely than men to support the banning of coal. One possible reason for this result could be that women tend to be more environmentally aware and concerned about environmental issues.

Education Level and Support for Banning Coal

The researcher found that there is a significant association between education level and support for banning coal, based on both the Pearson chi-square test (χ^2 = 17.671, df = 8, p = .024). The results suggest that individuals with higher levels of education are more likely to support the banning of coal. One possible reason for this result could be that higher education is associated with greater environmental awareness and pro-environmental behaviour. Educated individuals may be more informed about the negative impact of coal on the environment and may be more supportive of taking action to mitigate its effects.

Education Level and Year of Coal Banning

The analysis revealed a significant association between education level and the year of coal banning, based on the Pearson chi-square test (χ^2 = 77.338, df = 6, p < .001). The results suggest that individuals with higher levels of education are more likely to support an earlier year for the banning of coal. One possible reason for this result could be that educated individuals are more likely to be aware of the urgency of transitioning to renewable energy sources and may be more supportive of more aggressive timelines for phasing out coal.

Age and Year of Coal Banning

It is found that there is a marginally significant association between age and year of coal banning, based on the Pearson chi-square test (χ^2 = 9.111, df = 4, p = .058). The results suggest that younger age groups are more likely to support an earlier year for the banning of coal. One possible reason for this result could be that younger individuals are more aware of the urgency of addressing climate change and may be more supportive of taking action to mitigate its effects.

Education Level and Steps to Transition

The analysis revealed a significant association between education level and steps to transition to renewable energy sources, based on the Pearson chi-square test (χ^2 = 71.000, df = 3, p < .001). The results suggest that individuals with higher levels of education are more likely to

support more steps to transition to renewable energy sources. One possible reason for this result could be that educated individuals are more informed about the benefits of transitioning to renewable energy sources and the steps needed to make this transition.

Marital Status and Support for Banning Coal

The analysis revealed a significant association between marital status and support for banning coal, based on the Pearson chi-square test (χ^2 = 92.972, df = 9, p < .001). The results suggest that individuals who are single or divorced are more likely to support the banning of coal than those who are married or in a domestic partnership. One possible reason for this result could be that individuals who are single or divorced may have fewer financial obligations and may be more willing to prioritize environmental concerns over economic considerations.

Residential Area and Support for Banning Coal

The analysis revealed a significant association between residential area and support for banning coal, based on the Pearson chi-square test (χ^2 = 92.341, df = 12, p < .001). The results suggest that individuals living in urban areas are more likely to support the banning of coal than those living in rural or suburban areas. One possible reason for this result could be that individuals living in urban areas may be more exposed to environmental issues and may be more aware of the negative impact of coal on the environment.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

In summary, FAES Campus staff and students demonstrated the participants have some level of knowledge about the use of coal as a source of energy, its potential environmental impacts, and the need to transition to alternative sources of energy sources. However, there is still a lack of knowledge regarding the intended banning of coal as a source of energy, its proposed year, and the steps needed to transition to cleaner energy sources.

When asked about the attitude towards the banning of coal as a source of energy in the developing countries the majority of participants supported the banning of coal as a source of energy, though they were hesitant to pay higher energy bills to support the transition to alternative sources of energy. Moreover, many participants believed that the banning of coal would have a negative economic impact on developing countries and that the benefits of using coal outweigh its negative impacts on the environment. However, there was a widespread belief that developed countries have a responsibility to help developing countries transition to alternative sources of energy.

The findings also revealed some interesting associations between demographic factors and attitudes towards coal banning with the younger participants and those with higher levels of education being more supportive of the banning of coal as a source of energy. Additionally, single individuals and those living in high-density residential areas were more supportive of the issue of coal banning.

All in all, the study highlights the need for increased education and awareness about the intended banning of coal as a source of energy and the importance of transitioning to cleaner energy sources. It also suggests that efforts should be made to address concerns about the economic impacts of the transition and to encourage individuals and organizations to take action towards reducing global carbon emissions. Additionally, the associations between demographic factors and attitudes towards coal banning suggest that targeted education and awareness campaigns may be more effective in certain populations.

6.2 RECOMMENDATIONS

Increase education and awareness-raising efforts on the negative impacts of coal usage and the benefits of renewable energy sources in developing countries, particularly in Zimbabwe.

Provide assistance to developing countries to transition towards cleaner energy sources, particularly by developed countries.

Promote renewable energy alternatives and raise awareness about the negative impacts of coal usage.

Encourage universities to play a more significant role in supporting the transition to cleaner energy sources, particularly through research.

Conduct further studies in other developing countries to compare the level of knowledge, attitudes, and practices towards the banning of coal as a source of energy and identify factors that influence these attitudes.

Develop policies and strategies that prioritize renewable energy sources over coal in developing countries, while taking into account the economic and social impacts of such policies.

Increase investment in renewable energy infrastructure in developing countries to facilitate the transition to cleaner energy sources.

Encourage public-private partnerships to support the development and deployment of renewable energy technologies in developing countries.

Provide financial incentives to encourage the adoption of renewable energy sources and support the phasing out of coal in developing countries.

Monitor and evaluate the impact of policies and strategies aimed at phasing out coal as a source of energy in developing countries to ensure their effectiveness and identify areas for improvement.

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APPENDICIES

APPENDIX 1: RESEARCH QUESTIONNAIRE

RESEARCH QUESTIONAIRE :(Knowledge, Attitude and practices towards coal banning as a source of energy in the developing countries).

My name is Evina Mapanzure and I am a fourth year student undertaking a bachelor of Science Honours Degree in Environmental Science (SHEM) at Bindura University of Science Education. I am carrying out a research titled the STAKEHOLDERS PERSPECTIVES ON THE BANNING OF COAL AS A SOURCE OF ENERGY IN DEVELOPING COUNTRIES. The study is for learning purposes and seeks to assess the knowledge, attitudes, and practices towards the banning of the use of coal as a source of energy in the developing countries among FAES staff and students of BUSE. Your voluntary cooperation will be greatly appreciated if you can allow me to interview you based on this questionnaire. Feel free to answer, all ethical considerations were observed.

INSTRUCTIONS TO PARTICIPANTS

- *Tick on the appropriate answer and fill where ever possible.*
- *Do not write your name on any part of the paper.*

SECTION A: SOCIO- DEMOGRAPHICS CHARACTERISTICS

1. Age (years):   18-25 ☐   26-33 ☐   34-41 ☐   42-49 ☐   50 + ☐
2. Sex: Male ☐   Female ☐
3. Place of residence: Low density ☐ Medium density ☐ High density☐
4. Relationship status: Married ☐   Divorced ☐   Single ☐
5. Household position Father ☐ Mother☐ Son ☐ Daughter☐
6. Highest Educational level: Primary ☐   Secondary ☐ Tertiary ☐
7. Employment: Unemployed ☐ Employed☐

	SECTION B: KNOWLEDGE ON COAL BANNING AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES	
Number	**Knowledge**	**Answers**
1.	What are the major uses of coal in developing countries	

2.	What are the possible environmental impacts of coal usage on the environment?	
3.	Have you heard about the intended banning of coal as a source of energy?	Yes ☐ No ☐
4.	By which year is it proposed to ban coal?	
5.	What are the alternative energy sources that can replace coal in developing countries?	
6.	Do you think developed countries should provide assistance to developing countries to transition to cleaner energy sources?	Yes ☐ No ☐
7.	What steps do you think developing countries should take to transition to cleaner energy sources? Answer: ……………………………………………………………………………………………… …………………………………………………………………………………………… ……………………………………………………………………………………………	
8.	**SECTION C ATTITUDES**	
9.	Do you support the banning of coal as a source of energy in developing countries?	Yes ☐ No ☐ Do not know ☐
10.	Do you believe that the health risks associated with coal mining and burning justify a ban on coal as a source of energy?	Yes ☐ No ☐ Do not know ☐
11.	Do you think the transition to alternative sources of energy would be feasible for developing countries?	Yes ☐ No ☐ Do not know ☐

12.	Would you be willing to pay higher energy bills to support the transition to alternative sources of energy?	Yes ☐ No ☐ Do not know ☐
13.	Do you believe the banning of coal would have a negative economic impact on developing countries?	Yes ☐ No ☐ Do not know ☐
14.	Do you think that developed countries have a responsibility to help developing countries transition to alternative sources of energy?	Yes ☐ No ☐ Do not know ☐
15.	Do you think the benefits of using coal are more than its impacts on the environment?	
16.	What measures do you think should be put in place to ensure a successful transition away from coal in developing countries? Answer:…………………………………………………………………………… ………………………………………………………………………………… …………………………………………………………………………………	
17.	How important do you think it is for individuals and organizations to take action towards reducing global carbon emissions? Answer:…………………………………………………………………………… ………………………………………………………………………………… …………………………………………………………………………………	
	What role do you think universities can play in supporting the transition to cleaner energy sources in developing countries? Answer: ………………………………………………………………………….. ………………………………………………………………………………… ………………………………………………………………………………… …………………………………………………………………………………	
	SECTION D: PRACTICES	

18.	Do you use coal for domestic or business purposes?	Yes ☐ No ☐
19.	.Do you support the banning of coal as an energy source?	Yes ☐ No ☐

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BINDURA UNIVERSITY OF SCIENCE EDUCATION

04 March 2023

Dear Sir/Madam

REQUEST FOR PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

PROJECT TITLE: *STAKEHOLDERS PERSPETIVES ON COAL BANNING AS A SOURCE OF ENERGY IN THE DEVELOPING COUNTRIES*

ACADEMIC SUPERVISORS: DR NYAMUGURE

This letter serves to inform you that **Mapanzure Evina Shamiso, Registration Number (B192204B)** is a fourth year student at Bindura University of Science Education, in the Department of Environmental Science. During her fourth year of study she is supposed to do a research project in her area of specialisation.

Please assist in any possible way. Data collected will be used for academic purposes only and will not be published without your prior consent.

Thank you for your assistance.

Yours faithfully,

Mr T. Nyamugure
DEPARTMENT OF ENVIRONMENTAL SCIENCE

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