



**FACTORS INFLUENCING ENVIRONMENTALLY RESPONSIBLE
BEHAVIOUR OF LOCAL COMMUNITIES TOWARDS GUNUNG ARONG
STATE PARK FOREST, MERSING, JOHOR, MALAYSIA**

By

SITI DESSYMA BINTI ISNANI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of Master of
Science**

February 2023

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Forests play significant roles in maintaining balanced biodiversity and ecosystem, human wellbeing and living quality, national revenue and reputation. However, forest sustainability is a global challenge. Initiatives such as ecotourism and community forestry are being introduced to protect nature and enhance sustainability. In recent years, Gunung Arong, which is the third highest mountain in Johor, Malaysia, has made Gunung Arong State Park Forest (GASPF) an ecotourism hotspot. Visitors and local communities enjoy recreation and outdoor activities. However, instead of being involved in ecotourism, most local communities are working in agricultural, livestock farming, and fisheries sectors. This phenomenon has adverse impacts on forest sustainability, especially if the local communities do not use the forest responsibly and exploit it for economic benefits. Therefore, understanding the environmentally responsible behaviour (ERB) of local communities as frequent forest users is crucial. The literature emphasises the influences of environmental sensitivity and environmental attitudes, including environmental worldview (general attitude) and place attachment (specific attitude) on ERB. However, the findings are inconsistent and have yet to reach a shared conclusion. This study, therefore, identifies the factors that influence the local communities' ERB. A quantitative study with a self-administered questionnaire was conducted along with a pilot study to ensure the questionnaire had good internal consistency. Then, the data were collected from a total of 160 respondents across three villages adjacent to GASPF. IBM SPSS Statistics Version 25 was employed to analyse the data, while descriptive, correlation, and multiple linear regression analyses were performed. Descriptive results showed that local communities in GASPF are mostly Malays and have been living in their villages for at least 11 years. Overall, local communities have a positive environmental worldview, environmental sensitivity, place attachment, and ERB towards GASPF. Correlation analysis indicated that all three independent variables, namely environmental worldview, environmental sensitivity, and place attachment, correlate positively to ERB. Lastly, all

independent variables influence the local communities' ERB, with place attachment being the strongest predictor, followed by environmental sensitivity and environmental worldview. The authorities could use the findings to design strategies to enhance the local communities' ERB. With the ERB enhanced, the authorities can implement community forestry initiatives in GASPF to foster locals' sustainable relationships with GASPF. The local communities could benefit economically and be involved in conservation and ecotourism management while also maintaining the ultimate goal of forest sustainability.

Keywords: environmentally responsible behaviour, environmental sensitivity, environmental worldview, place attachment

SDG: GOAL 3: Good Health and Well-being, GOAL 11: Sustainable Cities and Communities

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**FAKTOR-FAKTOR YANG MEMPENGARUHI PERILAKU ALAM SEKITAR
BERTANGGUNGJAWAB KOMUNITI TEMPATAN TERHADAP HUTAN
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Hutan memainkan peranan penting dalam mengekalkan keseimbangan biodiversiti dan ekosistem, kesejahteraan dan kualiti hidup manusia, dan pendapatan dan reputasi negara. Walau bagaimanapun, kelestarian hutan adalah cabaran global. Inisiatif-inisiatif seperti ekopelancongan dan perhutanan komuniti telah diperkenalkan untuk melindungi alam semula jadi dan meningkatkan kelestarian. Dalam beberapa tahun kebelakangan ini, Gunung Arong yang merupakan gunung ketiga tertinggi di Johor, Malaysia telah menjadikan Hutan Taman Negeri Gunung Arong (GASPF) satu tempat tarikan ekopelancongan. Pengunjung dan komuniti tempatan suka melakukan rekreasi dan aktiviti luar. Namun, daripada melibatkan diri dalam ekopelancongan, kebanyakan komuniti tempatan bekerja dalam sektor pertanian, penternakan, dan perikanan. Fenomena ini menyebabkan kesan buruk terhadap kelestarian hutan, terutama jika komuniti tempatan tidak menggunakan hutan secara bertanggungjawab dan mengeksploitasikannya untuk faedah ekonomi. Oleh itu, pemahaman mengenai perilaku alam sekitar bertanggungjawab (ERB) komuniti tempatan yang merupakan pengguna hutan yang kerap adalah sangat penting. Literatur telah menekankan pengaruh kepekaan terhadap alam sekitar dan sikap terhadap alam sekitar termasuk pandangan terhadap alam sekitar (sikap umum) dan pertautan tempat (sikap spesifik) pada ERB. Walau bagaimanapun, hasil kajian masih belum konsisten dan belum mencapai kesimpulan. Oleh itu, kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi ERB komuniti tempatan. Kajian kuantitatif dengan soal selidik tinjauan sendiri telah dijalankan dengan kajian perintis untuk memastikan soal selidik mempunyai konsistensi dalaman yang baik. Kemudian, data telah dikumpulkan dari sejumlah 160 responden di tiga kampung yang berdekatan dengan GASPF. IBM SPSS Statistik Versi 25 telah digunakan untuk menganalisis data, sementara analisis deskriptif, korelasi, dan regresi berganda linear telah dijalankan. Hasil deskriptif menunjukkan bahawa komuniti tempatan yang berdekatan dengan GASPF kebanyakannya berbangsa Melayu dan telah tinggal di kampung mereka selama

11 tahun sekurang-kurangnya. Secara keseluruhan, komuniti tempatan mempunyai tahap pandangan terhadap alam sekitar, kepekaan terhadap alam sekitar, pertautan tempat, dan ERB terhadap GASPF yang positif. Analisis korelasi menunjukkan bahawa ketiga-tiga pemboleh ubah tak bersandar, iaitu pandangan terhadap alam sekitar, kepekaan terhadap alam sekitar, dan pertautan tempat berkorelasi positif dengan ERB. Akhir sekali, semua pemboleh ubah tak bersandar mempengaruhi ERB komuniti tempatan dengan pertautan tempat merupakan peramal terkuat, diikuti oleh kepekaan terhadap alam sekitar dan pandangan terhadap alam sekitar. Pihak berkuasa boleh menggunakan hasil kajian ini untuk merancang strategi demi meningkatkan ERB komuniti tempatan. Dengan ERB dipertingkatkan, pihak berkuasa boleh melaksanakan inisiatif perhutanan komuniti di GASPF untuk memupuk hubungan lestari komuniti tempatan dengan GASPF. Komuniti tempatan dapat memperoleh keuntungan dari segi ekonomi dan terlibat dalam pengurusan pemuliharaan dan ekopelancongan, sementara mengekalkan kelestarian hutan sebagai matlamat utama.

Kata Kunci: kepekaan terhadap alam sekitar, pandangan terhadap alam sekitar, perilaku alam sekitar bertanggungjawab, pertautan tempat

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LIST OF ABBREVIATIONS

ERB	Environmentally Responsible Behaviour
GARF	Gunung Arong Reserved Forest
GASPF	Gunung Arong State Park Forest
NEP	New Ecological Paradigm
RM	Ringgit Malaysia





CHAPTER 1

INTRODUCTION

This chapter introduces the background of this study, explains its justification along with its significance. The chapter then articulates the research questions and objectives that will guide the study.

1.1 Background of Study

Forests play a central role in the ecosystem and undeniably significant roles for every nation and human wellbeing. Communities depend on forests for food, herbs and medicine, and fuel (Asmamaw & Verma, 2013; Bakar et al., 2022). In terms of ecosystem services, forests supply clean water and fresh air by sequestering the carbon in the air. They also accommodate an abundance of flora and fauna. An undamaged forest maintains a balanced ecosystem, conserves biodiversity, and protects the quality of the environment, which, in turn, ensures and enhances the quality of human life.

Forests are also ideal places for recreation and ecotourism activities (Ahmad et al., 2020; Asmamaw & Verma, 2013), where people can rest, relax, escape from their hectic daily routines, and improving their mental health and general wellbeing. They strengthen people's bonds with friends and families through picnicking, hiking, camping, team building, or other recreational activities. Apart from that, forests or natural areas play vital roles in terms of revenue generation for the community and country (Fatt et al., 2014). This is because forests produce timber, non-timber products or agricultural productions as sources of income. Besides, forest products are valuable and can be exported as revenues for the country.

Furthermore, excellent and well-known ecotourism attractions can stimulate the economy and generate revenues for the country (Chiu et al., 2014; Hanafiah & Harun, 2010; Mileti et al., 2022). For many nations, the tourism industry, which includes ecotourism, has contributed significantly to the nations' gross domestic product (Hanafiah & Harun, 2010). This is because popular ecotourism destinations attract domestic and foreign tourists, and with international tourists comes an inflow of foreign currencies. The ecotourism industry generates plenty of jobs and business opportunities that benefit local communities (Fatt et al., 2014; Hanafiah & Harun, 2010). Associated industries include retail and souvenir, accommodation, food and beverage, and transportation industries (Hanafiah & Harun, 2010).

However, all these benefits or advantages are based on the quality and sustainability of the forests or natural environment. If the quality of the resources

and natural environment is not well-maintained, communities who depend on the forest resources and services could be affected adversely, especially in terms of their income and livelihoods (Asmamaw & Verma, 2013; Chomitz et al., 2007; Sapkota et al., 2022). For instance, when local communities do not use the soil responsibly, the soil degrades and ceases to be fertile, thereby affecting their agricultural productions and forest timber products in the long run.

In terms of ecotourism activities, if the operators or tour guides do not show concern for environmental protection, and tourists do not behave responsibly towards the environment during ecotourism activities, the environment for ecotourism would be degraded and will not sustain for the long-term. Thus, tourist satisfaction would be reduced and threaten tourist attachment, loyalty, and revisit intention (Baker & Crompton, 2000; Patwardhan et al., 2020). Moreover, they would not spread positive word-of-mouth or recommend to others regarding the destinations that they had a less satisfying experience (Meleddu et al., 2015). Therefore, ecotourism activities would not be able to sustain and could not provide long-lasting revenue for the communities and the country as a whole.

A concept named community forestry was introduced a few decades ago as an innovative tool to address forest degradation, conservation, and management (Gauld, 2000). According to Bull and White (2002), more than 10% of the forests globally are managed through community forestry models (as cited in Maryudi et al., 2012). Community forestry provides a solution to engage the local communities living adjacent to the forest to have a sustainable relationship with the forest in which it fulfils the goals of environmental protection and socio-economic development (Fisher et al., 2018; Kellert et al., 2009). This notion is supported by Haji et al. (2020) and Maryudi et al. (2012) that the few prime objectives of community forestry are to mobilise and empower local communities, alleviate their poverty, and improve the forest's conditions.

One of the significant characteristics of community forestry is the business development in terms of job opportunities or self-employment opportunities by fulfilling new market demands in which local communities have access and benefit from the forest adjacent to their neighbourhood. This notion is supported by Hakim (2015) that landscape features in neighbourhood areas such as parks, forests, waterfronts, and lakefronts are the environmental assets for the residents. Ideal landscapes such as parks and forest areas with either challenging or easy hiking trails or happening waterfronts and lakefronts tend to attract visitors to spend time with their friends and families. Therefore, many job opportunities, new markets, or new business opportunities are made available. Absolutely, it is great for the locals to operate a business such as a stall, restaurant, or convenience shop nearby those landscape features. Besides, tour guides are needed in forest areas with challenging hiking trails. While interpreters could also play a meaningful role, especially in educating the hikers or ecotourists about the natural environments or the particular natural areas they are visiting, regardless of whether they are the residents within the neighbourhood or visitors.

Apart from that, environmental protection or forest conservation is another vital agenda of community forestry. The local communities should make decisions and contribute efforts to protecting and caring for the forest (Asmamaw & Verma, 2013). They are the guardians of their living environment and ensure people behave responsibly towards the forest environment. Through this, local communities are empowered and play vital roles caring for and protecting the forest by detecting, reducing, or ceasing illegal activities. By fulfilling this agenda, local communities reduce the workloads of the authorities significantly. Nevertheless, with the community forestry initiative, in those forests or natural areas suffering from resource degradation, the local communities have to start by restoring forest resources before benefiting from the forest economically.

1.2 Statement of Problem

In Malaysia, all natural areas such as national parks, state parks, eco-parks, amenity forests, and so forth are managed under the authority of State Forestry Departments. However, it is hard for the authorities to keep an eye on everything that happens in every forest area under their authority. Locals' irresponsible use of forests or illegal activities in the natural or protected areas by intruders are reported frequently (Guharajan et al., 2021). This is undeniably a serious issue affecting the quality and sustainability of natural areas (Asmamaw & Verma, 2013). For the authority to counter every illegal activity would be costly, time-consuming, and require significant manpower.

In Mersing, Johor, Gunung Arong State Park Forest (GASPF) houses the third highest mountain in Johor – Gunung Arong. GASPF is rich in varied species of flora and fauna, including the endemic species Resak Batu (*Cotylelobium melanoxydon*). In recent years, GASPF has become a popular ecotourism hotspot among local communities and visitors, especially for its hiking activity. However, according to the head of the Kampung Penyabong village, Mr. Wan Azman bin Wan Jusoh, there is a lack of local participation in forest conservation management and ecotourism development in GASPF (W. A. W. Jusoh, personal communication, September 20, 2017). Lack of community participation and engagement in biodiversity conservation and ecotourism is one of the constraints for natural resources management (Cutumisu, 2003; Shereni & Saarinen, 2021). Similarly, local communities' participation is a key factor in the long-term conservation management of natural resources (Asmamaw & Verma, 2013; Siraj et al., 2018).

In addition, according to Mersing District Forest Officer, Mdm. Jennifer Francis, locals' irresponsible use of forests or illegal activities such as poaching, trees cutting, illegal settlement, and gold mining are reported frequently in the GASPF (J. Francis, personal communication, September 21, 2017). This phenomenon often leads to excessive land use, which then degrades and causes negative impacts on the forest in the long run, such as deforestation (Asmamaw & Verma, 2013; Legesse et al., 2003; Omran & Schwarz-Herion, 2020).

Therefore, it is necessary to involve locals through a community-based conservation approach in order to sustain the protected areas while uplifting the economy of the locals (Asmamaw & Verma, 2013; Legesse et al., 2003; Miyamoto, 2020; Wang & Tong, 2009). Community forestry is an effective approach that involves the local communities in decision-making and benefit-sharing to achieve forest conservation and economic development with the cooperation of various parties, including the authorities, practitioners, and local communities. Through community forestry, the authority's workload and costs of forest management and conservation can be reduced. First and foremost, the local communities' environmentally responsible behaviour (ERB) has to be determined or enhanced as ERB indicates local communities' everyday practices, which can either help ameliorate or deteriorate environmental issues (Grilli & Curtis, 2021; Mobley et al., 2009). With the local communities' ERB enhanced, the authorities could then implement and ensure that the community forestry initiative would probably be successful and more efficient in achieving both goals as local communities are not concerned with the economic benefits only.

ERB has been receiving attention in ecological conservation and sustainable tourism studies to understand the effects of human behaviours on the environment and tourism (Grilli & Curtis, 2021; Lee et al., 2013). Although significant studies have been conducted, the complicated causal relationships of human behaviours are still not fully explored as numerous researchers (e.g., Cheng & Wu, 2014; Grilli & Curtis, 2021; Sivek, 2002) urged for more empirical studies to be conducted to cover less explored variables or test the model developed on different backgrounds to verify the findings.

Previous researches show that when local communities have a positive environmental worldview, when they respect and care for the environment, and when the local communities are attached to the adjacent forests or natural areas, they would behave responsibly towards the environment (Bennett et al., 2018; Cheng & Wu, 2014; Collado et al., 2013; Hungerford & Volk, 1990; Lee, 2011; Mobley et al., 2009; Ramkissoon et al., 2013a, 2013b; Vaske & Kobrin, 2001). However, the impacts of environmental worldview on ERB have not reached a consensus and scholars' findings have not reached a consistent pattern yet (e.g., Collado et al., 2013; Cottrell, 2003; Mobley et al., 2009; Wearing et al., 2002). Sivek (2002) also urged more empirical studies investigate the impacts of environmental sensitivity on ERB, which is significant yet hardly explored to date. Place attachment is another controversial variable in ERB studies because different scholars adopted different measurements and reached different findings. Thus, more studies with various backgrounds are needed to adopt a more comprehensive place attachment measurement to determine its impacts on ERB (Daryanto & Song, 2021; Devine-Wright & Clayton, 2010; Halpenny, 2010; Ramkissoon et al., 2012; Scannell & Gifford, 2010).

This study seeks to fulfil the gaps mentioned by determining the ERB of the local communities living nearby GASPF and identifying the influence of the environmental worldview, environmental sensitivity, and place attachment on

their ERB. It focuses on local communities because they live adjacent to the forest and interact most with it. As such, they could be causing serious impacts on the forest in the long run (Lee et al., 2013). The findings of this study should help the GASPF authorities understand the ERB of the local communities and pinpoint factors influencing their ERB so that the authorities can plan strategies to strengthen the local communities' ERB. With the local communities' ERB identified and strengthened, the authorities are better positioned to implement the community forestry initiative in GASPF to ensure GASPF's sustainability and empower the local communities socio-economically at the same time.

1.3 Research Questions

To close the gaps as mentioned earlier, this study aims to answer the following four research questions:

- a) What are the socio-demographic characteristics of the local communities living adjacent to Gunung Arong State Park Forest (GASPF)?
- b) What are the levels of the local communities' environmental worldview, environmental sensitivity, place attachment, and environmentally responsible behaviour (ERB) towards GASPF?
- c) How do environmental worldview, environmental sensitivity, and place attachment correlate to ERB?
- d) What factors influence the ERB of local communities towards GASPF?

1.4 Objectives of the Study

The main objective of this study is to identify the factors that influence local communities' ERB towards GASPF, Mersing, Johor. The specific objectives of this study are:

- a) To identify the socio-demographic characteristics of the local communities living adjacent to GASPF.
- b) To determine the levels of local communities' environmental worldview, environmental sensitivity, place attachment, and ERB towards GASPF.
- c) To determine the correlation between environmental worldview, environmental sensitivity, place attachment, and ERB.
- d) To identify the factors that influence the ERB of local communities towards GASPF.

1.5 Significance of the Study

The rationale to conduct this study is to contribute to the body of knowledge of ERB. By adapting the Sustainable Tourism Behaviour Model of Cheng and Wu (2014), this study focused on local communities living adjacent to forest areas instead of tourists. In addition, this study provides information regarding the factors influencing ERB, including environmental worldview, environmental sensitivity, and place attachment, in which scholars have urged for more studies. Adding general environmental attitude measured by environmental worldview seeks to complement the specific environmental attitude assessed by place attachment in the model of Cheng and Wu (2014) in which scholars (e.g., Blake, 2001; Hines et al., 1987; Mobley et al., 2009) emphasised that both general and specific environmental attitudes are vital yet different, and thus should be both included in a study. The framework used in this study could be adopted in future studies with different backgrounds to compare the findings.

Practically, this study enables related agencies or authorities to understand the ERB level of the local communities living adjacent to GASPF and the factors influencing their ERB. The findings help the authorities comprising the Forestry Department of Peninsular Malaysia and Johor Forestry Department to make more informed decisions and statistics-based planning to enhance local communities' ERB. Then, the authorities could plan to implement community forestry initiatives in GASPF so that locals benefit economically from GASPF and are also involved in forest conservation and ecotourism management as guardians of their forest. Together they can ensure the sustainability of GASPF.

1.6 Definition of Key Terms

To provide a clear foundation for the study, several main concepts mentioned repeatedly are defined based on this study's context, including ERB, environment attitude, environmental worldview, place attachment, and environmental sensitivity.

1. Environmentally Responsible Behaviour (ERB)

ERB is defined as doing what is favourable to the environment in everyday practice as a means to help protect the environment (Cottrell, 2003; Zhang et al., 2019). In this study, ERB refers to local communities' ERB towards the GASPF.

2. Environmental Attitudes

Environmental attitudes are individual's psychological expression on the evaluation towards environment, aspects, or objects related to the environment, be it favourable or unfavourable, or, pro or con (Hines et

al., 1987; Li, 2018). In this study, two types of environmental attitudes are measured: environmental worldview (general environmental attitudes) and place attachment (specific environmental attitudes).

3. Environmental Worldview

An environmental worldview is one's general predispositions towards the natural environment (Stern, 2000). In this study, environmental worldview is measured using the revised New Ecological Paradigm (NEP) scale developed by Dunlap et al. (2000).

4. Place Attachment

Place attachment is referred to one's affective, cognitive, and functional bond with a place (Daryanto & Song, 2021; Halpenny, 2006). In this study, place attachment is measured by four dimensions: place identity, place dependence, place social bonding, and place affect.

5. Environmental Sensitivity

Environmental sensitivity is defined as a high degree of concern and respect to a geographical area or physical setting (Cheng & Wu, 2014). In this study, environmental sensitivity measures local communities' sensitivity to the GASPF.

1.7 Thesis Outline

This thesis is made up of five chapters. Chapter one starts with a brief introduction on the background of the study and the problem statement. It is followed by the research questions, the objectives, and the significance of the study. It also discusses the definitions of a few key terms and illustrates the outline of the thesis.

Chapter two is comprised of the literature reviews that serve as the base of this study and guide how this study would be conducted. Related topics discussed in this chapter include ERB, environmental attitudes, environmental sensitivity, and their relationships with each other. At the end of this chapter, a conceptual framework that guides this study is revealed.

Chapter three covers the methodology used in this study, which includes the study area, research approach, sample size, and sampling technique. Instrumentation, data collection procedures, and types of data analysis adopted are also included.

Chapter four presents and discusses the results generated from the analysis. Apart from that, some justifications and comparisons with past studies are included in the discussion.

Chapter five summarises the results and discusses the theoretical and practical implications of the study. Lastly, it reveals this study's limitations and recommends directions for future research.



CHAPTER 2

LITERATURE REVIEW

This chapter comprehensively discusses the main concepts, including environmentally responsible behaviour (ERB), environmental worldview, place attachment, and environmental sensitivity. Past studies that formed the theoretical foundations of this study and the study framework that guided this study are also examined.

2.1 Environmentally Responsible Behaviour (ERB)

Sustainable development or natural areas is an expanding global issue while ERB is closely associated with actualising sustainable development (Dolnicar & Grün, 2009).

Behaviour is defined as an individual's actual actions (Ajzen, 1985). While the definitions for ERB are plentiful where scholars defined it based on their perceptions. Terms similar to ERB include environmentally significant behaviour (Stern, 2000), sustainable behaviour (Meijers & Stapel, 2011), pro-environmental behaviour (Kollmuss & Agyeman, 2002), environmentally friendly behaviour, conservation behaviour, and stewardship behaviour (Mobley et al., 2009). The definitions of selected ERB terminologies are presented in Table 2.1.

Table 2.1: Terminology of environmentally responsible behaviour

Terminology	Definitions
Environmentally responsible behaviour (ERB)	ERB is regarded as doing what is favourable to the environment in everyday practice as a means to protect the environment (Cottrell, 2003; Zhang et al., 2019).
Pro-environmental behaviour	Individual consciously seeks to minimise the negative impact of one's actions on the natural and built world (Kollmuss & Agyeman, 2002).
Environmentally significant behaviour	Environmentally significant behaviour can reasonably be defined by its impacts: the extent to which it changes the availability of material or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself (Stern, 2000).

Table 2.1: continued

Sustainable behaviour	People who are high in considering future consequences are more likely to behave more sustainably and make a sustainable choice (Meijers & Stapel, 2011).
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(Source: Adapted from Lee et al., 2013)

Stern (2000) defined ERB as people's intentional action which will cause direct or indirect impacts to the environment or benefits the environment. While Monroe (2003) referred to ERB as the effort to seek information, make decisions, and commit to environmental citizenship. In addition, some scholars defined ERB as a means to prevent, address, and solve environmental issues (e.g., Chao & Lam, 2011; Huang & Yore, 2005; Hungerford & Volk, 1990). Nevertheless, Cottrell (2003) and Zhang et al. (2019) regarded ERB as doing what is favourable to the environment in everyday practice as a means to help protect the environment, in which this definition is adopted in this study.

Some scholars perceived that people with ERB characteristics will try their best to sustainably practice minimum environmental impacts to protect the ecosystem, resources, and environment voluntarily (e.g., Allock et al., 2020; Kollmuss & Agyeman, 2002; Lee, 2011). Nevertheless, people might recognise the impacts of some of their actions or behaviours, either favourable or unfavourable to the environment. It includes individual habits such as the usage of plastic bags and household practices such as the types of heaters or the paper towels usage, to the bigger decisions such as eco-friendly vehicles or air-conditioning systems in the house. However, people might not realise the environmental impacts of some of their actions (Stern, 2000). For instance, consumers barely know the manufacturing process of some products they purchase as to whether they are environmental-friendly or have negative impacts on the environment, such as causing air pollution or water pollution (Stern, 2000).

It is not easy to assess one's ERB. However, to measure ERB quantitatively, several scholars have presented categories of environmental actions along with respective measurement items. One of the earliest categorisations of ERB consisted of persuasion, political action, eco-management, consumerism, and legal action (Hungerford et al., 1980). While Stern (2000) produced different categorisations, which include public environmental activism (e.g., involving in environmental organisations), non-activist political behaviours (e.g., petitioning or writing to local authorities on the environmental issues), and non-activist private environmentalism (e.g., purchasing of green and eco-friendly products, saving energy). With slight modifications from Stern's ERB categorisations, Dono et al. (2010) assessed ERB with three dimensions: consumer behaviour, willingness to pay, and environmental citizenship.

Smith-Sebasto and D'Costa (1995) also categorised and developed a set of unidimensional measurement scales for ERB comprised of 28 items that include six categories of environmental actions, namely civic action, educational action, financial action, legal action, physical action, and persuasive action. Since then, it has been frequently adopted and adapted with minor modifications in sundry studies (e.g., Kil et al., 2014; Lee, 2011; Thapa, 2010). Cheng and Wu (2014) and Vaske and Kobrin (2001) utilised items of general and specific environmental actions to assess ERB based on their study context.

For instance, Cheng and Wu (2014) measured the general ERB through the items including trying to solve environmental problems, reading materials related to the environment, discussing environmental issues with others, and trying to convince companions to act positively, while specific ERB was assessed through the items reporting to the authorities any inadequate environmental behaviour, deterring any behaviour damaging the environment, picking up trash and branches, and participating in clean-up activities.

2.2 Environmental Attitudes

Attitudes are defined as an individual's beliefs and feelings towards a specific object or subject, which could be favourable or unfavourable (Egaly & Chaiken, 1993; Fishbein & Ajzen, 1974). Fishbein and Ajzen (1974) developed a social-psychological framework that depicts attitudes that would consistently influence or predict an individual's intention and behaviour towards the object. Through the framework, it is undeniable that attitudes are antecedents and significant determinants of how people behave consistently towards an object of concern.

Regarding the environment, environmental attitudes are an individual's psychological expression on the evaluation towards the environment or aspects or objects related to the environment, be it favourable or unfavourable, or pro or con (Hines et al., 1987; Li, 2018). Environmental attitudes are crucial as it determines people's behaviour towards the environment, either protecting or causing damage to the environment which, in turn, affects the sustainability of the environment (Mobley et al., 2009; Tian et al., 2020). Therefore, in ensuring the wellbeing of the earth, human environmental attitudes play a vital role. This is the reason why environmental attitudes have been one of the significant research concerns in the environmental sector for decades.

Literature related to ERB convey differences in people's general attitudes towards the environment or specific attitudes (Liu et al., 2020; Mobley et al., 2009). Specific attitudes correlate to specific behaviours, and general attitudes correspond to only general behaviours (Choi & Johnson, 2019; Liu et al., 2020). Therefore, measuring only general attitudes towards the environment is insufficient to assess specific environmental attitudes or behaviours (Casaló & Escario, 2018; Hines et al., 1987; Mayer & Frantz, 2004; Ryan & Spash, 2012). Both general and specific environmental attitudes are different yet crucial and

thus should both be included but measured distinctly in a study (Blake, 2001; Casalo & Escario, 2018; Hines et al., 1987; Mobley et al., 2009). For instance, Mobley et al. (2009) and Choi and Johnson (2019) adopted environmental concern as the specific environmental attitude in their study to complement the environmental worldview (general environmental attitude). However, in this study, place attachment is adopted as the specific environmental attitude to complement the general environmental worldview in estimating the attitude-behaviour relationship.

2.3 General Environmental Attitude: Environmental Worldview

General environmental attitude is one's general worldview towards the environment (Liu et al., 2020; Mobley et al., 2009) or one's general predispositions (Stern, 2000). The widely adopted scale to measure environmental worldview or general environmental attitude is the unidimensional New Ecological Paradigm (NEP) scale developed by Dunlap et al. (2000). It is the revised version from its original scale of the New Environmental Paradigm by Dunlap and Van Liere (1978). This is a reliable scale which had frequently been adopted by scholars including Kil et al. (2014), King-Chan et al. (2020), Mobley et al. (2009), Rosa et al. (2022), and Thapa (2010). The NEP scale reveals humans' general beliefs about the outcomes of their environmental behaviours, which include pollution and resource use (Kil et al., 2014).

This NEP scale has been subjected to meticulous and diligent methodological assessments to portray and reflect a more comprehensive measure of human beliefs and attitudes towards the environment (Dunlap et al., 2000). It assesses the independent relationships between humans and the environment, which is opposite from the viewpoint of the Human Exemptionalism Paradigm that humans are independent of environmental issues (Kil et al., 2014). According to Dunlap et al. (2000), the 15 items in the NEP scale cover five facets about human's ecological worldview, which are:

- a) the reality of limits to growth (e.g., we are approaching the limit of the number of people the earth can support),
- b) anti-anthropocentrism (e.g., plants and animals have as much right as humans to exist),
- c) the fragility of nature's balance (e.g., the balance of nature is very delicate and easily upset),
- d) rejection of exemptionalism (e.g., despite our special abilities, humans are still subject to the laws of nature), and
- e) the possibility of an eco-crisis (e.g., humans are severely abusing the environment).

2.4 Specific Environmental Attitude: Place Attachment

Place is a spatial setting that could be transformed into a memorable location with worthwhile and valuable experiences (Leonard, 2013). There are two dimensions within the concept of place: physical and social (Dang & Weiss, 2021; Scannell & Gifford, 2010). While researchers who study the psychological dimension of the human-environment relationship distinguished place to be discerned into three interrelated dimensions, which are physical setting, activities carried out at the place, and meanings (Montgomery, 1998), while Tuan (1977) recognised the meanings as the most abstract dimension and most difficult to understand.

Attachment is the affection or emotional bond that connects individuals to other individuals or objects (Brocato, 2006; Kim & Stepchenkova, 2018; Low & Altman, 1992). Nevertheless, different scholars defined place attachment differently (Halpenny, 2010; Hidalgo & Hernández, 2001). Generally, most scholars mentioned place attachment as the affective bond and emotional connections established between individuals and places or other environmental settings (e.g., Hidalgo & Hernández, 2001; Moore & Graefe, 1994). While Morgan (2010) defined place attachment as the experience of a person's long-term affective bond to a specific place and the signification or meaning ascribed to that bond.

In this study, the definition of place attachment from Halpenny (2006) is adopted, an affective, cognitive, and functional bond with a place. In fact, place attachment is a type of attitudinal construct, which is a specific environmental attitude. This notion is supported by Jorgensen and Stedman (2001) who mentioned that place attachment measures people's attitudes towards a place in which the spatial settings are served as attitude objects even though the scholars used the term "sense of place" in their study to describe the relationship or bonding between human and place.

Place attachment has several dimensions frequently adopted by scholars (Halpenny, 2010; Hidalgo & Hernández, 2001), including place identity, place dependence, place social bonding, and place affect. Some studies adopted only place identity and place dependence in their studies (e.g., Brown & Raymond, 2007; Dwyer et al., 2019; Lee, 2011; Vaske & Kobrin, 2001; Williams & Vaske, 2003). However, the crucial affective and social components of attachment were frequently added to the place attachment construct in the more recent research: the place affect and place social bonding. This could be attributed to place attachment as an attitudinal construct. It is comprised of the reactions from the three components, namely affective, cognitive, and functional or conative towards spatial settings (Halpenny, 2006; Jorgensen & Stedman, 2001; Moulay & Ujang, 2021).

An affective component reflects the emotional attachment or bonding to the place, the cognitive component is related to the thoughts, knowledge, or beliefs

to the place, while the functional or conative component concerns the behaviours or activities that happen in the physical settings (Kyle et al., 2004). Therefore, place identity is of the cognitive component, place dependence and place social bonding are of the functional or conative component, and place affect is of the affective component (Brocato, 2006; Daryanto & Song, 2021; Halpenny, 2006; Kyle et al., 2004; Kyle et al., 2005; Yuksel et al., 2010).

2.4.1 Place Identity

Place identity is referred to as the dimensions of self, which is a highly personal connection to a place, including an individual's cognitive connection with the particular physical settings and their symbolic bonding to those places that defines who they are (Daryanto & Song, 2021; Raymond et al., 2010). Place identity is also an individual's personal identity which developed over an extended period (Morgan, 2010) through the attributes such as the physical settings itself and the activities carried out which allow individual's interaction with the place and memories collection that influence their perceptions towards the specific place (Bernardo & Palma, 2005; Dwyer et al., 2019; Stedman, 2002; Wester-Herber, 2004).

Hence, activities and the length of time involved are the factors that develop people's personal identity and attachment to a place. This type of attachment is known as place identity. While place identity is also influenced by people's conscious and unconscious paragons, feelings, preferences, targets, beliefs, values, and behavioural intentions (Proshansky, 1978).

2.4.2 Place Dependence

Place dependence is reflected through the goal-directed or functional bonding between the people and the place in concern (Daryanto & Song, 2021; Smaldone et al., 2005). People's dependence on a place could be established when they identify and realise that the particular place could grant their desired functional needs better than other alternative places for similar purposes (Ujang et al., 2018; Yuksel et al., 2010). Place dependence is also the reflection to which how well or the degree of the place can fulfil or serve people's intended needs, wants, or goals (Brocato, 2006; Jorgensen & Stedman, 2001).

In the sense of place dependence, a place would be important and meaningful to people due to its functional values. Place dependence could be predicted by the quality of a particular place and the relative quality of their substitute places that offer similar functional values or support the desired activities (Han et al., 2019; Ponzetti, 2003; Smaldone et al., 2005). For outdoor recreational settings, for instance, people could develop place dependence on specific settings or resources because it is a good place to carry out their desired activities or provides better facilities or settings than alternatives (Moore & Graefe, 1994).

2.4.3 Place Social Bonding

Another dimension of place attachment is place social bonding. It is one of the functional components in place attachment. In environmental psychology, several scholars have adopted social bonding as one of the dimensions in place attachment (e.g., Hidalgo & Hernández, 2001; Kastenholz et al., 2020; Kyle et al., 2004; Kyle et al., 2005; Low & Altman, 1992; Mesch & Manor, 1998; Ramkissoon et al., 2013b). When people have meaningful and memorable social relationships while conducting activities at a place, people would develop certain connections with the place as it provides space for the social relationships to have happened and maintained (Kyle et al., 2005). This is how place social bonding is developed.

Several studies discovered similar findings where social ties, social involvements, or number of close friends and family within residential areas could predict people's attachment towards their neighbourhood (e.g., Hidalgo & Hernández, 2001; Mesch & Manor, 1998). Nevertheless, social attachments could be even stronger than the attachments associated with the physical settings or their attributes (Hidalgo & Hernández, 2001; Kyle et al., 2005). Memorable social relationships and experiences with friends could be the overriding and ruling substance of attachment (Hay, 1998).

2.4.4 Place Affect

Place affect is another dimension of place attachment. It reflects people's emotional or affective bond with physical settings or geographical areas (Hoang et al., 2020; Jorgensen & Stedman, 2001). Scholars found that people develop an emotional attachment to a place through the interaction with the setting or other components within that setting that allows the accumulation of feeling to occur (Eisenhauer et al., 2000; Tuan, 1977). Over time, they might feel that the particular place is special as compared to other places (Eisenhauer et al., 2000).

This dimension is often combined with the place identity dimension, yet scholars have shown that both dimensions are different (e.g., Brocato, 2006; Halpenny, 2006; Kyle et al., 2004; Yan & Halpenny, 2022). Nevertheless, this is indeed one of the significant dimensions of place attachment. In the study of Jorgensen and Stedman (2001), for example, the items assessed the affective attachment dimension gained the highest mean score and outranked the place identity and place dependence dimensions.

2.5 Environmental Sensitivity

Environmental sensitivity is another vital approach in the field of environment and resource management. It has been one of the concerns among

environmental practitioners, environmental educators, and scholars since decades ago. Yet, a definition for environmental sensitivity has yet to be reached.

Hungerford and Volk (1990) defined it simply as the affective attribute that causes individuals to view the environment empathetically. While Chawla (1998) regards environmental sensitivity as a predisposition to feel concerned about the environment, be interested in learning about it, and act accordingly to conserve it. Cheng and Wu (2014) mentioned that there are two distinct parts to environmental sensitivity. The first is an individual's view towards the natural environment, be it favourable or unfavourable. The second is the intention to take actions for having a peaceful relationship with the natural environment. The authors also stated that some people might care, concern, appreciate, respect, and be sensitive to the environment, yet they might not be motivated enough to take actions to protect the environment. All in all, the definition of Cheng and Wu (2014) is adopted in this study where environmental sensitivity refers to the high degree of concern and respect to a geographical area or physical setting.

Scholars have been putting effort into developing one's environmental sensitivity or figuring out the environmental sensitivity profile (e.g., Peterson & Hungerford, 1981; Tanner, 1980). For instance, Hungerford et al. (1992) mentioned that people with environmental sensitivity could be expressed by conserving natural resources, preserving significant ecological areas, are unlikely to litter natural places, tend to hunt and fish ethically, and to protect the balance between human population and ecology (as cited in Sivek, 2002). In short, scholars regarded environmental sensitivity as a significant concept associated with the development of environmental citizenship and ERB (Hungerford & Volk, 1990).

2.6 Theoretical Foundations

Cheng and Wu (2014) developed the Sustainable Tourism Behaviour Model by referring to the model of Fishbein and Manfredo about the relationship between cognition, affection, attitude, and behaviour to understand how ERB is formed. In their study, environmental knowledge is adopted to measure the cognition dimension; environmental sensitivity to represent the affection dimension; place attachment to assess the attitude dimension, and ERB is the behaviour dimension (Figure 2.1).

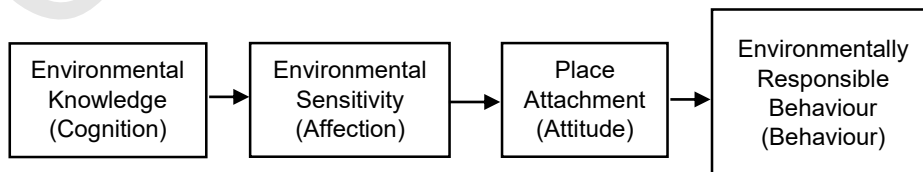


Figure 2.1: Conceptual framework of Cheng and Wu (2014)

They hypothesised the linear relationship that environmental knowledge (cognition) would affect environmental sensitivity (affection). In turn, environmental sensitivity (affection) would affect place attachment (attitude), and place attachment (attitude) would affect tourists' ERB (behaviour).

Yet, they found that besides place attachment, tourists' environmental sensitivity has a direct and significant effect on ERB, while environmental knowledge indirectly affects tourists' ERB mediated by environmental sensitivity (Figure 2.2). Cheng and Wu (2014) studied island tourism. This current study investigates the factors with direct influence on local communities' ERB towards Gunung Arong State Park Forest (GASPF). Therefore, place attachment and environmental sensitivity from Cheng and Wu's (2014) Sustainable Tourism Behaviour Model are adopted in this study.

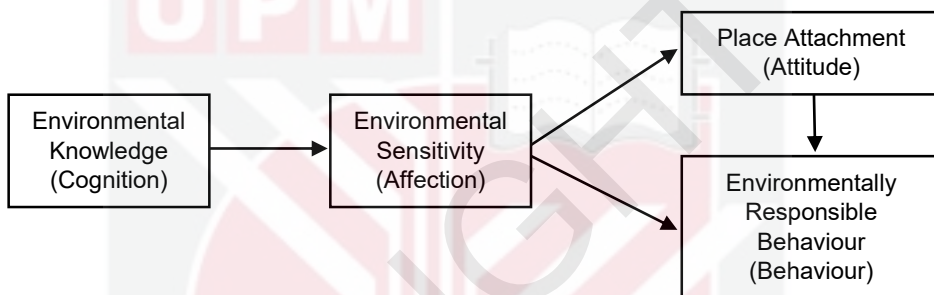


Figure 2.2: Cheng and Wu's (2014) Sustainable Tourism Behaviour Model

As mentioned earlier, scholars (e.g., Blake, 2001; Mobley et al., 2009) have emphasised general and specific environmental attitudes, in which both are different yet vital to be measured in a study as the attitudinal construct. Hence, environmental worldview (general environmental attitude), which complement the place attachment (specific environmental attitude), was adopted in this study.

2.6.1 The Relationship between Environmental Worldview and Environmentally Responsible Behaviour (ERB)

To measure environmental worldview, NEP has been adopted in studies with a wide array of settings and in sundry disciplines, including psychology, sociology, geography, and even political science (Lundmark, 2007). Not to mention, it has been utilised in various environmental studies, including which investigated its relationship with human's ERB (e.g., Kil et al., 2014; King-Chan et al., 2020; Mobley et al., 2009; Sharma & Gupta, 2020). Most of the studies reported positive and significant relationships between environmental worldview and ERB. For instance, in a study conducted in Switzerland, the scholars found that environmental attitudes such as individual philosophical beliefs about the environment positively influenced their ERB (Schultz et al., 2004). Mobley et al.

(2009), Collado et al. (2013), and Park et al. (2018) also found that environmental worldview predicts ERB.

Stern et al. (1995) demonstrated that environmental attitudes positively influenced respondents' support of ERB, such as supporting stricter environmental policies and laws, writing letters to politicians on the environmental issues, and being willing to pay higher conservation taxes. A recent study of King-Chan et al. (2020) in the Philippines proved that environmental attitudes measured by NEP in their study has a significant relationship with the ERB and gained the highest coefficient among the other variables tested.

However, there are also studies that reported that environmental attitudes failed to predict or did not significantly influence the ERB of the respondents, such as Cottrell (2003) and Wearing et al. (2002). These studies concluded that more studies are needed to further examine the relationship between environmental worldview and ERB in various settings. This could help policymakers in their strategy planning since ERB is vital in determining the sustainability of the environment.

2.6.2 The Relationship between Place Attachment and Environmentally Responsible Behaviour (ERB)

According to Bowlby (1979), attachment theory initially studied the relationships between parent and infant (as cited in Brocato, 2006). Attachment is defined as a strong emotional bond that grows between a person and a particular object or a person of concern (Brocato, 2006). Scholars have expanded the application of attachment theory to sundry fields such as consumer behaviour, brand and marketing, neighbourhoods, social environment, and social friendships, including varied fields involving the bonds to persons, places, and objects (Brocato, 2006). This study focuses on place attachment. The "attachment" implies the bonding, while the "place" is the environmental, geographical, or physical settings with which individuals develop emotional bonds over time (Brocato, 2006; Low & Altman, 1992; Moore & Graefe, 1994). Place attachment encompasses a wide array of environments, including specific destinations, buildings, homes, neighbourhoods, and landscapes, or to a larger extent, regions, towns, and cities, or imagined places such as planets and the universe (Low & Altman, 1992).

In natural resource management, place attachment is significant as it is potentially efficacious in portraying the human aspect in environmental management (Chow et al., 2019; Kaltenborn & Williams, 2002; Nian et al., 2019). Numerous studies have proven the significant relationships between place attachment and ERB, which include Devine-Wright and Howes (2010), Halpenny (2010), Raymond et al. (2010), Vaske and Kobrin (2001), and Williams and Vaske (2003). While other studies discovered that place attachment positively

affects people's ERB (e.g., Daryanto & Song, 2021; Lee, 2011; Ramkissoon et al., 2013a, 2013b; Vaske & Kobrin, 2001). When individual cares, respects, and possesses a high level of place attachment, they are likely to behave positively and act favourably for the sake of the place's sustainability (Cheng & Wu, 2014). Despite many studies stating that place attachment is a useful factor in determining or enhancing people's ERB, numerous scholars such as Devine-Wright and Clayton (2010) and Scannell and Gifford (2010) emphasised that the relationships between place attachment and ERB have yet to reach a consensus and more studies are needed. Perhaps this can be attributed to scholars adopting distinct combinations of place attachment dimensions. For example, as reported by the Dang and Weiss (2021) and Dwyer et al. (2019), many of the studies adopted place identity and place dependence as the two dimensions of place attachment in which Raymond et al. (2010) posited that some vital bonding to the nature and social environment which are associated to people's attachment to the place might be overlooked.

Few studies, including Brocato (2006) and Ramkissoon et al. (2013a, 2013b), have adopted place attachment as a multi-dimensional construct which is made up of place identity, place dependence, place social bonding, and place affect in their research. This has given space to adopt all four dimensions in the place attachment construct to determine its relationship with ERB in GASPF.

2.6.3 The Relationship between Environmental Sensitivity and Environmentally Responsible Behaviour (ERB)

Related research started from a study conducted by Tanner (1980) who investigated significant life experiences which influenced respondents to have involved in conservation works or environmental education. His work was followed by Nancy Peterson who furthered and deepened the research in environmental sensitivity and its predictors. While Peterson and Hungerford (1981) was the first published study to start using the term environmental sensitivity.

Since then, even though studies regarding the relationship between environmental sensitivity and ERB are limited, yet groups of scholars (e.g., Cheng & Wu, 2014; Hungerford & Volk, 1990; Peterson & Hungerford, 1981) have proven that environmental sensitivity is one of the precursors for an individual's environmental behaviour performance. This conveys that people with high environmental sensitivity are more likely to behave responsibly and positively to the environment. Hungerford and Volk (1990) claimed that it is because environmental sensitivity contributes to the development of environmental citizenship in people in which individuals have the sense to fulfil their responsibility in protecting the natural environment. While Sia et al. (1986) likewise found that environmental sensitivity has the second highest correlation with responsible environmental behaviour and is also one of the most significant predictors among eight predictors. Cheng and Wu (2014) also successfully

proved that environmental sensitivity has statistically significant and positive impacts on an individual's ERB.

Sivek (2002) has emphasised that research on environmental sensitivity is scarce. The paucity of empirical studies on environmental sensitivity calls for more related studies to be carried out to provide more empirical findings on the relationships between the two constructs since the literature has highlighted their significant relationship. Therefore, in this study, examining the level of the local communities' environmental sensitivity towards GASPF and the influences of environmental sensitivity towards local communities' ERB is vital since the literature has demonstrated that it is probably one of the key concepts that determines the sustainability of GASPF.

2.7 Study Framework

Figure 2.3 presents a conceptual framework designed for this study that shows the potential relationship between the variables from the reviewed literature. The variables included in this study are environmental worldview, environmental sensitivity, place attachment, and ERB of the local communities towards GASPF.

The left side of Figure 2.3 shows the independent variables (also known as predictor variables) of this study, which are the environmental worldview, environmental sensitivity, and place attachment. While the right side of the figure is the dependent variable, which is the ERB of the local communities towards the GASPF, as influenced by the levels of local communities' environmental worldview, environmental sensitivity, and place attachment towards GASPF.

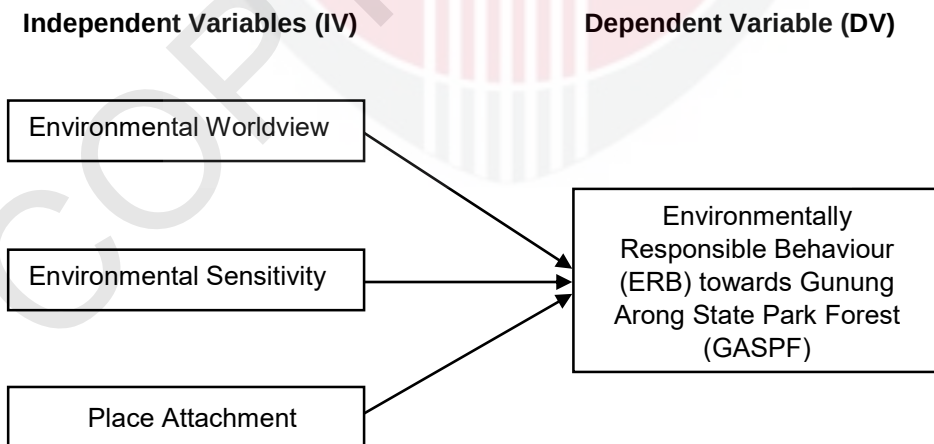


Figure 2.3: Conceptual framework of this study

CHAPTER 3

METHODOLOGY

This chapter discusses details of the research methodology, such as the study area, research approach, sample size, sampling method, instrumentation and measurement, data collection, and data analysis.

3.1 Study Area

The study site chosen for this study was Gunung Arong State Park Forest (GASPF). It is located inside the Gunung Arong Reserved Forest (GARF), Mersing district of Johor. GASPF is 28 km from Mersing and 30 km from Endau (Johor Forestry Department Official Portal, n.d.). Figure 3.1 shows the location of GARF and Figure 3.2 shows the location of GASPF in GARF.

The GASPF covers an area of 4,301 hectares from the total area of 12,871.67 hectares of GARF (Forestry Department of Peninsular Malaysia, n.d.). It is incredibly significant as it is rich in flora and fauna, including a few endemic species, such as Resak Batu (*Cotylelobium melanoxylon*). Varied activities are frequently carried out at GASPF, which include hiking and other outdoor recreation activities, besides educational, learning, and research activities (Johor Forestry Department Official Portal, n.d.). Hiking Gunung Arong is one of the main attractions in the GASPF. It stands at 240 metres which ranks it the third highest mountain in Johor. In recent years, it has become a popular site for Johor adventure tourism where locals as well as tourists hike and enjoy the breathtaking view over the South China Sea at the peak (Figure 3.3).

Data were collected from the local communities living at the three villages adjacent to the GASPF, namely Kampung Tanjung Resang, Kampung Sisek, and Kampung Penyabong (Figure 3.2), which are distant from GASPF by about 8 km, 12 km, and 17 km, respectively.

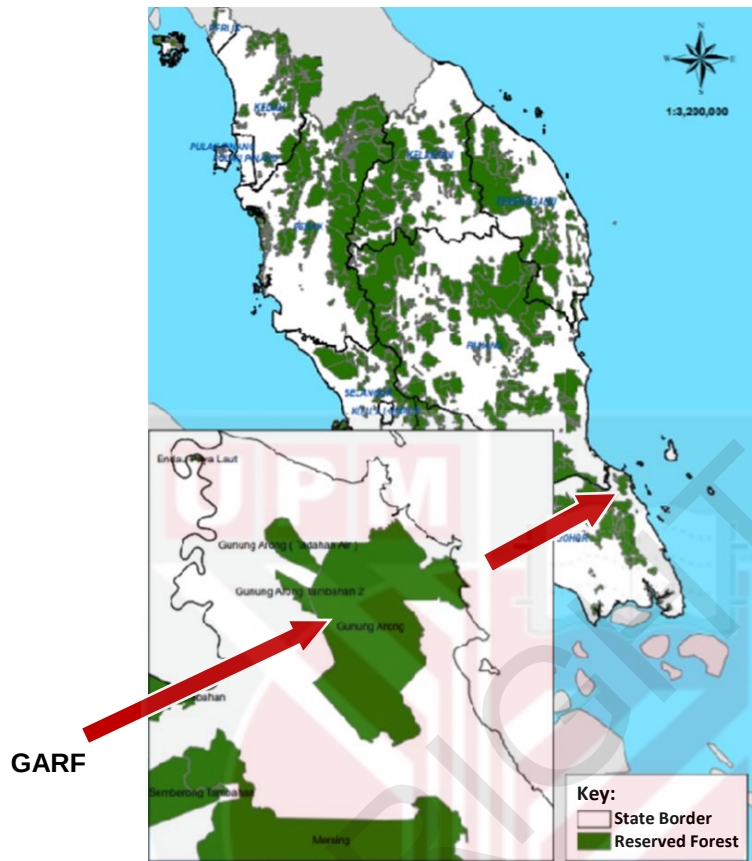


Figure 3.1: Location of Gunung Arong Reserved Forest (GARF)
 (Source: Forestry Department of Peninsular Malaysia Official Portal, n.d.)

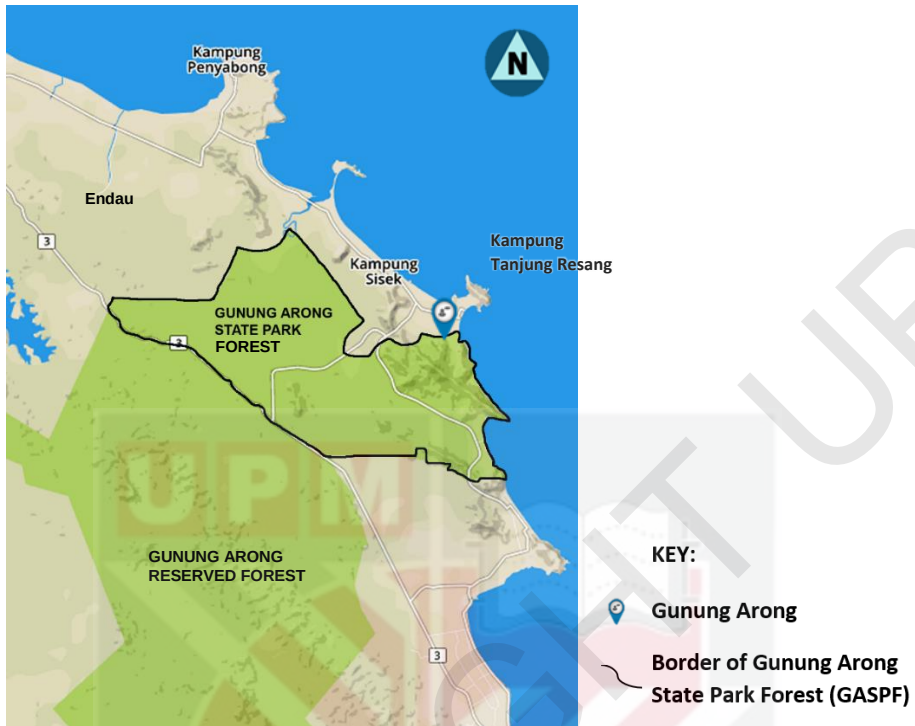


Figure 3.2: Location of GASPF, Gunung Arong, and adjacent villages
 (Source: Forestry Department of Peninsular Malaysia, n.d.)



Figure 3.3: View from Gunung Arong
 (Source: Johor Forestry Department Official Portal, n.d.)

3.2 Research Approach

The quantitative approach was employed in this study. According to McLeod (2019), the quantitative approach is suitable for studies that investigate the cause-and-effect relationships between variables. This is because the data collected quantitatively is measurable and subject to run statistical analyses to ascertain the relationships between dependent and independent variables (McLeod, 2019).

This study adopted three types of research approaches: descriptive, correlational, and causal. Descriptive research was employed to answer the first and second objectives of this study, which were (1): to identify the socio-demographic characteristics of the local communities living adjacent to GASPF and (2): to determine the levels of local communities' environmental worldview, environmental sensitivity, place attachment, and ERB towards GASPF. At the same time, the correlational approach was adopted to determine the correlation between environmental worldview, environmental sensitivity, place attachment, and ERB. The causal type of research answered the causal relationship between the variables in this study, which was to complete the fourth objective of this study, namely to identify the factors that influence the ERB of local communities towards GASPF.

3.3 Sample Size

Sample size is important to ensure the data collected for the study represents the general population. In this study, G*Power 3 was used to calculate sample size because it is a robust and flexible stand-alone power analysis application capable of calculating ideal sample size (Faul et al., 2007). Kelley and Maxwell (2003) mentioned that sample size estimation from a power analytic process would strengthen the study outcomes and contribute more meaningful findings to the body of knowledge. In addition, with G*Power 3's improved effect size calculators and ability to cover various statistical tests, it has been frequently used, especially in social and behaviour studies (Faul et al., 2007).

As shown in Figure 3.4, by using G*Power Version 3.1.9.7, with the effect size f^2 of 0.15, α error probability of 0.05, power ($1-\beta$ error probability) of 0.80, and the number of predictors, which was 3 in this study, the results showed that the minimum total sample size required for this study was 77. However, a total of 160 responses was successfully collected in this study.

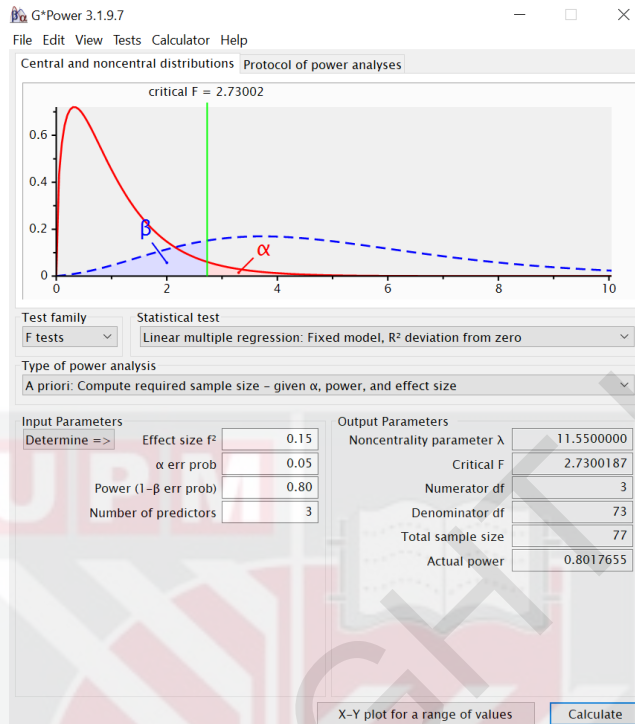


Figure 3.4: Sample size generated from G*Power Version 3.1.9.7

3.4 Sampling Technique

Purposive sampling was used to collect data for this study. Purposive sampling is also known as judgement sampling or deliberate sampling, in which researchers select the respondents whom they believe can represent the population based on their judgement on criteria set beforehand. In this study, respondents selected were the local communities who live in Kampung Tanjung Resang, Kampung Sisek, or Kampung Penyabong, aged 18-years and above, and can respond to the questionnaires. Purposive sampling is chosen as it is efficient, effective, and practical (Tongco, 2007) and able to generalise to the population based on the results obtained (Glen, 2015).

3.5 Instrumentation

A questionnaire is a tool to collect data for a study. For this study, a survey questionnaire was created as the instrument for data collection. Simple terms were used, and all items in the questionnaires were designed directly to enhance the respondents' understanding in answering the questionnaire. The questionnaire was designed by referring to past studies and consisted of five

sections with multiple-choice questions, short answer text questions, and Likert scale questions.

Section A of the questionnaire was designed to obtain information about the socio-demographic characteristics of the respondents. It was made up of ten items: village, length of residence, gender, age, marital status, ethnicity, religion, education level, occupation, and gross monthly income. While Section B was to capture the environmental worldview, which was measured by the New Ecological Paradigm (NEP) scale, Section C was to obtain the environmental sensitivity, Section D was to acquire the place attachment of the respondents towards the GASPF, and lastly, Section E was to assess the environmentally responsible behaviour (ERB) of the respondents towards the GASPF. The number of items and sources of each construct are listed in Table 3.1.

Table 3.1: Source and number of items of each construct

Construct	Number of Items	Source
Environmental Worldview	15	New Ecological Paradigm (NEP) scale adopted from Dunlap et al. (2000)
Environmental Sensitivity	4	Sivek (2002)
Place Attachment	12	Ramkissoon et al. (2013b)
Environmentally Responsible Behaviour (ERB)	8	Cheng & Wu (2014)

3.6 Scale of Measurement

For the socio-demographic characteristics of the respondents, nominal, ordinal, and ratio measurement scales were used. The nominal scale was used for the items including village, gender, marital status, ethnic, religion, and occupation, whereas the ordinal scale was used for education level. To assess the information including length of residence, age, and gross monthly income of the respondents, a ratio scale was used. However, for those items with ratio scales, the data was decoded into ordinal scales to present as categorical data because it is simpler for the overview of the results.

For Sections B, C, D, and E, a Likert scale was adopted. A Likert scale is a convenient and efficient method to assess opinions, beliefs, and attitudes

(LaMarca, 2011). It is also easy to comprehend besides providing sufficient choices for the respondents to choose their answers based on their preference. In this study, the Likert scale comprised (1) represents strongly disagree, (2) represents disagree, (3) represents neutral, (4) represents agree, and (5) represents strongly agree.

The levels of the respondents' environmental worldview, environmental sensitivity, place attachment, and ERB towards GASPF were measured by the mean and percentage from all of the 160 responses collected. The overall mean scores of each construct were calculated by totalling up the mean scores of all the items and divided by the total number of items in the particular construct. The general formula of mean score calculation is illustrated in the following equation:

$$\text{Mean Score} = \frac{\sum Xi}{n}$$

where

X = Score of the item (1, 2, 3, 4, 5)

i = Item (1, 2, 3,, n)

n = Total number of items

Every mean score greater than the mean value of 3.00 implies that the respondents agreed on those items or constructs. On the contrary, if the mean score is lower than 3.00, the respondents disagree.

For the environmental worldview, which was measured by the New Ecological Paradigm (NEP) scale, the odd-numbered items, namely Item 1, 3, 5, 7, 9, 11, 13, and 15 were worded in which the agreement conveys a pro-environmental worldview, while the even-numbered items, namely Item 2, 4, 6, 8, 10, 12, and 14 were designed in which the disagreement indicates a pro-environmental worldview (Dunlap et al., 2000). The even-numbered items in Section B were reversed coded during the data entry so they aligned with other items in which agreement conveys a pro-environmental worldview.

3.7 Pilot Test

The objective of the pilot study was to determine the internal consistency of the variables to ensure the instrument is reliable for the study. The coefficient of Cronbach's alpha that conveys the association strength between the items in variables normally ranges between zero to one (Howard, n.d.). A zero Cronbach's alpha implies all items measured in the variable are not likely related to each other, while Cronbach's alpha approximated to 1 conveys that the items are of a high level of internal consistency and probably measuring the same concept (Howard, n.d.).

Therefore, as shown in Table 3.2, George and Mallery (2003) suggest that the Cronbach's alpha coefficient must be 0.70 and above to be accepted as reliable (as cited in Rovai et al., 2013).

Table 3.2: Cronbach's alpha coefficient range

Range	Strength of Association
$\geq .9$	Excellent
$\geq .8$	Good
$\geq .7$	Acceptable
$\geq .6$	Questionable
$\geq .5$	Poor
$< .5$	Unacceptable

(Source: George & Mallery, 2003)

In this study, 40 samples were collected for the pilot study. After the analysis using IBM SPSS Statistics Version 25 software, the Cronbach's alpha coefficient for every variable in this study was shown in Table 3.3. Therefore, the instrument designed for this study had good internal consistency and was accepted for the real data collection.

Table 3.3: Cronbach's alpha coefficient for every construct tested

Construct	Number of Items	Cronbach's Alpha
Environmental Worldview	15	0.887
Environmental Sensitivity	4	0.857
Place Attachment	12	0.873
Environmentally Responsible Behaviour (ERB)	8	0.855

3.8 Data Collection

Data collection was carried out for two months throughout October and November 2018 in the villages adjacent to the GASPF, namely Kampung Tanjung Resang, Kampung Sisek, and Kampung Penyabong. Local communities residing at these three villages were asked if they agreed to be interviewed to participate in this survey. Self-administered questionnaires were distributed to the respondents, and they were briefed about the study before they started answering the questionnaire.

During the data collection, a total of 160 respondents agreed to take part in this study, whereby 49 were from Kampung Tanjung Resang, 40 were from Kampung Sisek, and 71 were from Kampung Penyabong respectively.

3.9 Data Analysis

IBM SPSS Statistics Version 25 was employed to perform data analysis after the data collection was completed. Three types of analyses were used to answer this study's objectives: descriptive analysis, correlation analysis, and multiple linear regression analysis.

3.9.1 Descriptive Analysis

Descriptive analysis presents an overall picture of the entire data set. In this study, descriptive analysis was employed to summarise the socio-demographic characteristics of the respondents. This analysis was also used to determine the levels of environmental worldview, environmental sensitivity, place attachment, and ERB of the respondents towards the GASPF. The levels were computed through the percentage and mean based on respondents' agreement levels on the Likert scale.

3.9.2 Correlation Analysis

Correlation is an analysis that assesses the strength and direction of the relationships between quantitative variables (Franzese & Iuliano, 2019; King-Chan et al., 2020). Two variables with high correlation imply a strong relationship between them, while a weak correlation indicates that the two variables are unlikely to be related. Three types of correlation coefficients are frequently adopted: Pearson's product-moment correlation coefficient, Spearman's rank correlation coefficient, and Kendall's correlation coefficient. However, choosing the suitable correlation coefficient is based on the variable types (Franzese & Iuliano, 2019). Since the Pearson correlation coefficient is suitable for continuous variables (Franzese & Iuliano, 2019), it was employed in this study to measure the relationships between environmental worldview, environmental sensitivity, place attachment, and ERB.

Correlation coefficient (r) is normally ranged between -1.0 and +1.0 (Taylor, 1990). Specifically, a positive r coefficient would indicate a positive relationship between variables, in which one variable would increase if another variable is increased, while a negative r coefficient conveys a negative or opposite relationship between the variables tested, which indicates that an increase in one variable would result in a decrease in another variable. Besides, the absolute value of the correlation coefficient quantifies the strength or magnitude of the relationship between the variables (Taylor, 1990). The closer the absolute value

of r coefficient to 1, the stronger the association or relationship between the variables tested. Table 3.4 shows Weber and Lamb's (1970) correlation coefficient interpretation (as cited in Taylor, 1990).

Table 3.4: Interpretation of correlation coefficient range

Range	Strength of Correlation
0	No correlation
$\leq .35$	Low or weak
$.36 \leq .67$	Modest or moderate
$.68 \leq 1.00$	Strong or high
1.00	Perfect correlation

(Source: Weber & Lamb, 1970)

3.9.3 Multiple Linear Regression Analysis

Regression is an analysis that estimates the causal relationships between variables. In this study, multiple linear regression analysis was employed to identify the factors that influence the ERB of the local communities towards the GASPF. Multiple linear regression analysis tests the dependent variable (or known as outcome variable) against two or more independent variables (or known as predictor variables). Through the analysis, the regression model generated informs the numerical relationships between the dependent and independent variables through the numerical values shown in the model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon$$

where

Y = Dependent variable

X_i = Independent variables

α = Constant

β_i = Regression coefficient of the variable X_i

ε = Error term

In this study, the dependent variable was the respondents' overall ERB index, while the independent variables were the respondents' environmental worldview, environmental sensitivity, and place attachment. There are several types of methods to perform multiple linear regression analysis. In this study, the enter method was used because it is suitable for a model with a small number of independent variables (Statistics Solutions, n.d.).

The confidence interval of 95% was used in this analysis to test the significance of the independent variables. Therefore, any independent variables with t-value > 1.960 and p-value < 0.05 were accepted as statistically significant to influence the local communities' ERB towards the GASPF.

In the F test, coefficient of multiple determination (R^2), and regression coefficient (beta) were also tested in the regression analysis. Through the F test, the model tested is accepted as significant if the F-value generated from the regression model is higher than the critical F-value. While the R^2 indicates how well the regression model is to explain the variances that have influences on the dependent variable, in which 0% implies that the model does not explain any variance while 100% conveys that the regression model is explaining all of the variances that are influencing the dependent variable. Next, the regression coefficients (beta) explain the independent variables' strength in affecting the dependent variable tested in the model. While positive or negative beta coefficients imply the types of relationships between the independent and dependent variables in which a positive beta indicates that the independent variable positively affects the dependent variable, and vice versa.

CHAPTER 4

RESULTS AND DISCUSSION

In this chapter, the results of the descriptive, correlation, and multiple linear regression analyses are discussed with reference to the respondents' socio-demographic characteristics, followed by the levels of environmental worldview, environmental sensitivity, place attachment, and environmentally responsible behaviour (ERB), the correlation between the variables, and the factors that influence local communities' ERB towards the GASPF.

4.1 Respondents' Socio-demographic Characteristics

Respondents' socio-demographic characteristics including the village, length of residence, gender, age, marital status, ethnicity, religion, education level, occupation, and gross monthly income, are shown in Table 4.1. The results from the descriptive analysis are discussed below.

Table 4.1: Distribution of respondents by socio-demographic characteristics (N = 160)

Measure	Frequency	Percentage (%)
Village		
Kampung Tanjung Resang	49	30.6
Kampung Sisek	40	25.0
Kampung Penyabong	71	44.4
Total	160	100.0
Length of Residence		
10 years and below	30	18.8
11 – 20	57	35.6
21 – 30	43	26.8
31 years and above	30	18.8
Total	160	100.0
Gender		
Male	91	56.9
Female	69	43.1
Total	160	100.0

Table 4.1: continued

Age Group		
18 – 25	41	25.6
26 – 35	52	32.5
36 – 45	35	21.9
46 – 55	22	13.8
56 years old and above	10	6.2
Total	160	100.0
Marital Status		
Single	62	38.8
Married	94	58.8
Divorced	4	2.5
Total	160	100.0
Ethnicity		
Malay	157	98.1
Chinese	2	1.3
Indian	1	0.6
Total	160	100.0
Religion		
Islam	158	98.8
Buddhist	1	0.6
Christian	1	0.6
Total	160	100.0
Education Level		
Informal Education	4	2.5
Primary School	11	6.9
Secondary School	53	33.1
STPM and Certificate	51	31.9
Diploma	28	17.5
Bachelor Degree	6	3.8
Master Degree	2	1.3
Doctor of Philosophy	3	1.9
Others	2	1.3
Total	160	100.0
Occupation		
Student	25	15.6
Self-employed	27	16.9
Government Sector	37	23.1
Private Sector	37	23.1
Retired	7	4.4
Housewife	25	15.6
Others	2	1.3
Total	160	100.0

Table 4.1: continued

Gross Monthly Income		
RM 1 - RM 1000	21	23.1
RM 1001 - RM 2000	38	41.7
RM 2001 - RM 3000	25	27.5
RM 3001 - RM 4000	6	6.6
RM 4001 and above	1	1.1
Total	91	100.0

First of all, based on Table 4.1, among the three villages adjacent to the GASPF, the highest percentage of the respondents were from Kampung Penyabong, which comprised of 44.4% out of the 160 respondents in this study. While another 30.6% and 25.0% of the respondents were from Kampung Tanjung Resang and Kampung Sisek, respectively.

The length of residence of the respondents was divided into four groups. By the time this data collection was conducted, most of the respondents have been living in their villages for 11-20 years, which was recorded as the highest percentage of 35.6%. It was then followed by 26.8% of the respondents living in their villages for 21-30 years. The other two groups of respondents who have been living for not more than 10 years and for at least 31 years now made up 18.8% of the respondents. This implies that the local communities enjoyed living adjacent to GASPF as over 80.0% of them have been living for at least 11 years and above. This is probably because they find living near GASPF beneficial as they enjoy the rich resources of GASPF, clean and fresh air, and easy access to recreational opportunities, which lead to a quality life compared to people living far from GASPF.

From gender, male respondents were accounted for 56.9% out of the 160 respondents in this study. While for the female respondents, it was 43.1%, which was slightly lower than the male respondents. The slightly higher number of male respondents is probably because males are normally the one who volunteer as the representative of their household to answer the questionnaire.

Next, the age of the respondents was classified into five groups. As shown in Table 4.1, the most dominant age group of the respondents living near GASPF was 26-35 years, which was comprised of the highest percentage of 32.5%. While the group of 18-25 years was the second most dominant age group, which was slightly more than one fourth (25.6%) among the 160 respondents. Next, the respondents aged 36-45 years comprised 21.9% while another 13.8% of the respondents were from the 46-55 years old. Last but not least, in this study, there were 10 respondents (6.2%) aged 56 years old and above.

In terms of marital status, the highest percentage was 58.8% out of the 160 respondents were recorded as married. The respondents who were single accounted for 38.8% while the remaining 2.5% of the respondents were divorced. This aligned with the Malaysia Population Census 2010, where 59.6% of the population are married, 35.1% are single, and a small proportion of the population is divorced (Department of Statistics Malaysia, 2011).

The ethnic and religious characteristics of the respondents were also collected. Based on Table 4.1, a total of 157 respondents (98.1%) were Malay. There were very few Chinese and Indian respondents in this study: two Chinese (1.3%) and one Indian respondent (0.6%). Likewise, in terms of religion, 98.8% equivalents to 158 respondents embraced Islam as their religion. There was only one Buddhist and one Christian, accounting for 0.6%. Malay respondents have made up nearly 100.0% of the respondents in this study because all of the three villages involved in this study, namely Kampung Tanjung Resang, Kampung Sisek, and Kampung Penyabong are mostly occupied by Malays, while the Chinese community reside in Mersing. The findings of this study are consistent with the previous survey done at Kampung Tanjung Resang, Kampung Sisek, Kampung Penyabong, and Kampung Air Papan where the respondents were 100.0% Malays (Forestry Department of Peninsular Malaysia, n.d.).

Concerning the highest education level attained by the respondents, Table 4.1 shows that the highest education level attained by the respondents was secondary school level (33.1%), followed by the STPM and Certificate was the second most dominant level of education (31.9% out of the 160 respondents). In total, 71.9% of the respondents had attained their education for at least primary school level or up to STPM and Certificate. This is consistent with the findings of Zhang and Lei (2012), where 72.0% of local communities mostly graduated from elementary school level or up to high school. While almost all respondents in this study had attained their formal education, including 7.0% had at least a Bachelor Degree, and four respondents (2.5%) never went for any formal education.

Table 4.1 shows that most of the respondents were working in the government and private sectors, with both categories accounting for 23.1% out of the 160 respondents in this study. It is followed by 16.9% of the respondents who were self-employed. However, students and housewives were recorded with a fairly big percentage too, which was 15.6% for each category. There was also a small percentage of retirees (4.4%).

Table 4.1 implies that the respondents' gross monthly income was in the middle range. Excluding several respondents who did not reveal their income, besides students, housewives, and retirees who presumably did not have a monthly income, among the 91 responses successfully collected on this item, the most common gross monthly income range was RM 1000 - RM 2000 with the highest percentage of 41.7%. In sum, nearly 65.0% of the respondents had a gross monthly income of no more than RM 2000. This is consistent with the previous survey, recorded as 60.0% (Forestry Department of Peninsular Malaysia, n.d.).

While there was only one respondent in this study (1.1%) with a gross monthly income of above RM 4000. This is probably attributed to the local communities' education level as high education qualification offers better employment opportunity (Hedge & Enters, 2000), which implies a higher income level.

4.2 The Level of Environmental Worldview

In this section, the environmental worldview perceived by the respondents living adjacent to GASPF is discussed. The mean and percentage of the environmental worldview were calculated from all respondents' agreement measured by the 15 items of the New Ecological Paradigm (NEP) scale, as shown in Table 4.2.

Table 4.2: Respondents' agreement level and overall mean on Environmental Worldview (N = 160)

Items	Respondents' Agreement (%)			Mean (M) ^d	Std. Dev. (SD)
	Disagree ^b	Neutral	Agree ^c		
1. We are approaching the limit of the number of people the earth can support.	10.0	14.4	75.6	3.86	0.98
2. Humans have the right to modify the natural environment to suit their needs. ^a	15.6	15.6	68.8	3.74	1.06
3. When humans interfere with nature it often produces disastrous consequences.	9.4	20.6	70.0	3.83	0.93
4. Human ingenuity will insure that we do not make the earth unlivable. ^a	10.6	18.1	71.3	3.79	0.95
5. Humans are severely abusing the environment.	12.5	19.4	68.1	3.78	1.01
6. The earth has plenty of natural resources if we just learn how to develop them. ^a	15.6	16.3	68.1	3.74	0.99
7. Plants and animals have as much right as humans to exist.	8.8	14.4	76.9	3.93	0.91

Table 4.2: continued

8. The balance of nature is strong enough to cope with the impacts of modern industrial nations. ^a	13.8	18.1	68.1	3.77	0.99
9. Despite our special abilities, humans are still subject to the laws of nature.	8.8	18.8	72.5	3.90	0.93
10. The so-called “ecological crisis” facing humankind has been greatly exaggerated. ^a	11.9	18.8	69.4	3.81	0.97
11. The earth is like a spaceship with very limited room and resources.	10.0	16.9	73.1	3.96	0.97
12. Humans were meant to rule over the rest of nature. ^a	11.9	21.9	66.3	3.76	0.97
13. The balance of nature is very delicate and easily upset.	5.0	17.5	77.5	4.02	0.82
14. Humans will eventually learn enough about how nature works to be able to control it. ^a	10.0	15.0	75.0	3.98	0.98
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	7.5	15.6	76.9	4.07	0.99

^a Reversed coded before data analysis, so that agreement implies pro-environmental worldview.

^b Combination of Strongly Disagree + Disagree.

^c Combination of Agree + Strongly Agree.

^d Mean was determined based on five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

Based on the results in Table 4.2, all of the 15 items measured were positive because the items' mean scores were above the mean value of 3.0. This implies that the majority of the respondents had a positive general worldview towards the environment, which is also known as the pro-environmental worldview.

The highest percentage of agreement towards the environmental worldview was 77.5% obtained by the item “the balance of nature is very delicate and easily upset.” This suggests that most of the respondents agree and recognise that the natural environment is fragile and needs our protection to sustain it for a very long time. While the item that gained the lowest agreement percentage from the respondents was “humans were meant to rule over the rest of nature” with the agreement of 66.3%. The least agreement of respondents on this item might be because some people agree that humans can manage and decide the plan for our nature. Yet, the respondents know that it should have a limit and a comprehensive plan without hurting nature as this item still indicated a positive environmental worldview with a mean score of 3.76.

4.3 The Level of Environmental Sensitivity

This section presents and discusses the level of respondents’ environmental sensitivity towards the GASPF. The environmental sensitivity was calculated using the mean and percentage of all responses collected on the four measured items, as shown in Table 4.3.

Table 4.3: Respondents’ agreement level and overall mean on Environmental Sensitivity (N = 160)

Items	Respondents’ Agreement (%)			Mean (M) ^c	Std. Dev. (SD)
	Disagree ^a	Neutral	Agree ^b		
1. I enjoy natural environments.	11.9	19.4	68.8	3.73	0.92
2. I am concerned about the ecological preservation in Gunung Arong State Park Forest (GASPF).	11.3	25.0	63.8	3.64	0.86
3. I appreciate the natural environment of GASPF.	5.6	25.0	69.4	3.83	0.80
4. I care about the impact of my living habits on the natural environments of GASPF.	7.5	20.0	72.5	3.88	0.85

^a Combination of Strongly Disagree + Disagree.

^b Combination of Agree + Strongly Agree.

^c Mean was determined based on five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

Based on Table 4.3, all of the four items measured were at the positive level because all items' mean scores were above the mean value of 3.0. This conveys that almost all of the respondents had a positive level of environmental sensitivity towards the GASPF. Respondents' positive level of environmental sensitivity indicates that the respondents are concern, care, and respect the environment (Cheng & Wu, 2014).

Among the four items measured, the highest percentage of agreement goes to the item "I care about the impact of my living habits on the natural environments of GASPF", with 72.5% agreement. This is attributed to the respondents know that they are the people living adjacent to the GASPF in which their daily activities or habits had the most direct impact on its sustainability. Thus, they care about their living habits to ensure the sustainability of GASPF because they wish to have the GASPF be there for a longer time and, undeniably, for future generations too.

The highest percentage of disagreement goes to the item "I enjoy natural environments" with 11.9% of disagreement from locals. This is probably just a matter of personal preference, which indicates that few respondents do not enjoy spending time at natural environments. Perhaps they are the indoor person who enjoys staying indoor. Nevertheless, as indicated by the higher percentage of agreement on the other items, some of them still care and appreciate the GASPF and are concerned about the ecological preservation in GASPF, presumably because they know the significance of natural environments.

4.4 The Level of Place Attachment

In this section, the results of respondents' place attachment level towards GASPF is presented. Table 4.4 illustrates that all dimensions of place attachment, which are place identity, place dependence, place social bonding, and place affect were all at the positive levels as all dimensions obtained mean scores above the mean value of 3.0, which conveys that the majority of the respondents had a positive level of place attachment towards GASPF.

As shown in Table 4.4, place affect obtained the highest mean of 3.96. The item "GASPF means a lot to me" gained the highest percentage of agreement among the respondents (79.4%), while the item "I feel strong sense of belonging to GASPF" obtained 76.9% of agreement. Lastly, the item "I am very attached to GASPF" was agreed by 75.0% of respondents. The results indicate that the majority of the local communities have a positive emotional attachment towards GASPF. This is probably because more than 80.0% of the local communities have been living in their villages adjacent to GASPF for at least 11 years (as shown in Table 4.1). Staying long-term in a place is likely to develop a relationship towards the place and perceive that the place is special (Eisenhauer et al., 2000). This finding confirms the results of Jorgensen and Stedman (2001)

where the dimension of affective attachment outranked the other dimensions in their study.

Table 4.4: Respondents' agreement level and overall mean on Place Attachment (N = 160)

Items	Respondents' Agreement (%)			Mean (M) ^c	Std. Dev. (SD)
	Disagree ^a	Neutral	Agree ^b		
Place Identity					
1. I feel GASPF is a part of me.	6.9	9.4	83.8	4.04	0.85
2. I identify strongly with GASPF.	8.1	18.1	73.8	3.86	0.90
3. Living around GASPF says a lot about who I am.	6.9	20.0	73.1	3.91	0.85
Total				3.94	0.55
Place Dependence					
4. For what I enjoy most, the settings and facilities provided by GASPF are the best.	4.4	23.8	71.9	3.91	0.80
5. For what I like to do, I could not imagine anything better than the settings and facilities provided by GASPF.	13.1	21.9	65.0	3.75	1.03
6. I enjoy living around GASPF and its environment more than any other places.	10.6	13.8	75.6	3.86	0.99
Total				3.84	0.53

Table 4.4: continued

Place Social Bonding					
7. My friends/family would be disappointed if I were to start living at other places.	12.5	21.9	65.6	3.72	0.95
8. If I were to stop living around GASPF, I would lose contact with a number of friends.	10.6	15.0	74.4	3.88	0.92
9. Many of my friends/family prefer GASPF over other places.	9.4	15.0	75.6	3.87	0.89
Total				3.82	0.58
Place Affect					
10. GASPF means a lot to me.	6.3	14.4	79.4	4.03	0.83
11. I am very attached to GASPF.	7.5	17.5	75.0	3.91	0.90
12. I feel strong sense of belonging to GASPF.	3.1	20.0	76.9	3.96	0.76
Total				3.96	0.50

^a Combination of Strongly Disagree + Disagree.

^b Combination of Agree + Strongly Agree.

^c Mean was determined based on five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

The dimension with the second highest mean was obtained by place identity with 3.94. The item "I feel GASPF is a part of me" gained the highest agreement level of 83.8% from place identity. While the other two items, which were "I identify strongly with GASPF" and "Living around GASPF says a lot about who I am" obtained a similar agreement from the respondents, with 73.8% and 73.1% respectively. This is attributed to the long residential period where length of time and local communities' memories contribute to the development of personal identity towards a place (Bernardo & Palma, 2005; Morgan, 2010; Stedman, 2002; Wester-Herber, 2004).

The third dimension was place dependence, with the mean of 3.84. For this dimension, 75.6% of respondents agreed to the item "I enjoy living around GASPF and its environment more than any other places." It is followed by 71.9% of agreement on the item "For what I enjoy most, the settings and facilities provided by GASPF are the best". Lastly, the item "For what I like to do, I could not imagine anything better than the settings and facilities provided by GASPF" gained the lowest agreement with 65.0%. The results indicate that GASPF provides quality functional values to local communities and tourists to carry out their desired activities (Brocato, 2006; Jorgensen & Stedman, 2001). This is because Gunung Arong is the third highest mountain in Johor and offers a spectacular bird eye's view of the South China Sea and a few islands nearby after a one-hour hike to the peak. The trail to the peak at Gunung Arong is not very tough and suitable for most people, including children and elders.

Last but not least, the dimension of place social bonding obtained the mean of 3.82. The item "Many of my friends/family prefer GASPF over other places" gained the highest agreement of 75.6%, while the item "If I were to stop living around GASPF, I would lose contact with a number of friends" was agreed by 74.4% of respondents, and the last item "My friends/family would be disappointed if I were to start living at other places" obtained a considerably high agreement of 65.6%. The results convey that local communities have a positive place social bonding towards GASPF. This is presumably because GASPF provides space for the local communities to develop and maintain meaningful social relationships by enjoying activities together with their friends and family (Hidalgo & Hernández, 2001; Kyle et al., 2005).

4.5 The Level of Environmentally Responsible Behaviour (ERB)

This section discusses the respondents' level of environmentally responsible behaviour (ERB) towards GASPF. The level of ERB was calculated using mean and percentage of all the responses collected on the eight items. The results are shown in Table 4.5.

Based on Table 4.5, all of the mean scores obtained by the eight items were all above the mean value of 3.0, which were in the range of 3.93 - 4.28. This indicates that most respondents had a positive level of ERB towards the GASPF. Among the eight items measured, the item "According to the law, I will deter any behaviour damaging the environment of GASPF" obtained the highest percentage of agreement with 88.1%, followed by the item "I pick up trash and branches when I see them in GASPF" with the second highest of agreement of 87.5%, while the third-highest was the item "When I see others' inadequate environmental behaviour in GASPF, I will report it to the authorities" with 84.4%. This indicates that most local communities play positive roles in ensuring the GASPF is in its top conditions at all times. They will do what they should do in terms of their roles and even forbid or report to the authorities if they find out someone is damaging the GASPF.

Table 4.5: Respondents' agreement level and overall mean on Environmentally Responsible Behaviour (ERB) (N = 160)

Items	Respondents' Agreement (%)			Mean (M) ^c	Std. Dev. (SD)
	Disagree ^a	Neutral	Agree ^b		
1. I try to solve the environmental problems in GASPF.	5.0	12.5	82.5	4.05	0.82
2. I read reports, books, and other materials related to the environments of GASPF.	2.5	14.4	83.1	4.10	0.73
3. I discuss with others about environmental protection of GASPF.	6.3	16.3	77.5	3.99	0.84
4. I try to convince companions to adopt positive behaviours in the natural environments of GASPF.	6.3	15.6	78.1	3.93	0.78
5. When I see others' inadequate environmental behaviour in GASPF, I will report it to the authorities.	3.8	11.9	84.4	4.13	0.78
6. According to the law, I will deter any behaviour damaging the environment of GASPF.	1.3	10.6	88.1	4.25	0.69
7. I pick up trash and branches when I see them in GASPF.	0.6	11.9	87.5	4.28	0.69
8. I participate in activities to clean GASPF.	3.8	13.8	82.5	4.14	0.82

^a Combination of Strongly Disagree + Disagree.

^b Combination of Agree + Strongly Agree.

^c Mean was determined based on five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

On the contrary, the item with the lowest percentage of agreement was "I discuss with others about environmental protection of GASPF" with 77.5%. This indicates that among the ways of showing their ERB towards GASPF, local communities do not favour involving themselves in discussion or theory sort of activities. This

is presumably attributed to their education level, in which the majority attained secondary school level. On the contrary, more of the local communities are keen to take actions to show their ERB towards GASPF.

4.6 Correlation between Independent and Dependent Variables

To answer the third objective of this study, the results of correlation analysis are shown in Table 4.6. Results show that all of the independent and dependent variables were positively correlated, indicated by the positive r coefficients generated. Therefore, an increase of every independent variable, namely environmental worldview, environmental sensitivity, and place attachment, would correspond to an increase of environmentally responsible behaviour (ERB).

Table 4.6: Correlation between independent variables and dependent variable (ERB)

Independent Variables	Correlation Coefficient (r)
Environmental Worldview (EW)	.62**
Environmental Sensitivity (ES)	.59**
Place Attachment (PA)	.66**

**Correlation is significant at the 0.01 level (2-tailed)

Based on the magnitude of r coefficients, all of the independent variables had moderate positive correlations with the ERB referring to the interpretation of r coefficient in Table 3.4, as all of the r coefficients were ranged from $r = .59$ to $r = .66$, $p < .001$. It implies that an increase in local communities' environmental worldview, environmental sensitivity, and place attachment towards GASPF would all correspond to an increase in local communities' ERB towards GASPF. Among the three independent variables, place attachment had the highest r coefficient with ERB ($r = .62$, $p < .001$), followed by environmental worldview ($r = .66$, $p < .001$), and last but not least, environmental sensitivity with $r = .59$, $p < .001$. The results convey that place attachment had the highest correlation with ERB, followed by environmental worldview and environmental sensitivity.

The results of this study is consistent with the findings of several previous studies, where Mobley et al. (2009) found that both general environmental attitude (environmental worldview) and specific environmental attitude (environmental concern) have moderate positive correlation with ERB, with both $r = .46$, $p < .001$, while Cheng and Wu (2014) discovered that environmental sensitivity and place

attachment have a moderate positive correlation with ERB. The findings of King-Chan et al. (2020) found that the environmental worldview has moderate positive correlation with ERB ($r = .43, p < .001$).

4.7 Factors Influencing Environmentally Responsible Behaviour (ERB)

To answer the fourth objective of this study, multiple linear regression analysis was carried out in which the environmental worldview, environmental sensitivity, and place attachment were tested as the independent variables influencing the environmentally responsible behaviour (ERB) of local communities towards GASPF. The results of multiple linear regression analysis are shown in Table 4.7.

Table 4.7: Relationship between ERB against Environmental Worldview, Environmental Sensitivity, and Place Attachment

Independent Variables	Unstandardised Coefficients		t-value	p-value
	B	Std. Error		
(Constant)	1.242	0.201	6.185	0.0001
1. Place Attachment	0.326	0.062	5.229	0.0001
2. Environmental Sensitivity	0.206	0.042	4.955	0.0001
3. Environmental Worldview	0.213	0.057	3.722	0.0001

Note: Significant at t-value > 1.960 and p-value < 0.05 (5% alpha level);
F = 69.803, p-value = 0.0001, $R^2 = 0.573$, and Adjusted $R^2 = 0.565$

The R^2 value generated from the model was 0.573. This conveys that the independent variables tested in this model, namely environmental worldview, environmental sensitivity, and place attachment, accounted for roughly 57% of all the variables influencing local communities' ERB towards the GASPF. However, there are still approximately 43% of other variables which are not tested in this model. Besides, the F-value obtained from the model was 69.803. This value was greater than its critical F-value ($F_{(3,156)} = 2.663$) at 5% level. Hence, it means the F test for the model was statistically significant, which implies that there is at least one significant factor influencing the dependent variable, which was ERB. The p-value generated from the model was 0.0001. Thus, it was significant at 0.05 level.

Any variable with a p-value lower than 0.05 and a t-value higher than 1.960 were considered as significant. Hence, for this study, all three independent variables

tested in this model, namely place attachment, environmental sensitivity, and environmental worldview, were significant in influencing local communities' ERB towards the GASPF, based on the respective t-values and p-values obtained.

Therefore, the final regression model was:

$$\begin{aligned} &\text{Environmentally Responsible Behaviour (ERB)} \\ &= 1.242 + 0.326 \text{ Place Attachment} + 0.206 \text{ Environmental Sensitivity} \\ &+ 0.213 \text{ Environmental Worldview} \end{aligned}$$

The t-values obtained from the analysis imply the relative significance of the independent variables in affecting the dependent variable. The higher the t-values of independent variables, the greater its significance in affecting the local communities' ERB towards GASPF. Table 4.7 shows that place attachment ($t=5.229$, $p=0.0001$) carried the most weight, which, in other words, was the strongest predictor in predicting local communities' ERB. This is followed by environmental sensitivity ($t=4.955$, $p=0.0001$) and environmental worldview ($t=3.722$, $p=0.0001$), which weighs the model's least. The results of specific environmental attitudes (place attachment) are a stronger predictor than general environmental attitudes (environmental worldview) aligned and supported by Hines et al. (1987) and Mobley et al. (2009).

All the independent variables positively influenced the local communities' ERB based on the respective positive beta coefficients obtained from the model. For the place attachment as the strongest predictor, if the local communities' place attachment towards GASPF increases by 1 unit, the level of local communities' ERB towards GASPF to be increased by 0.326 unit. This is because when local communities are highly attached to a place, it implies that they express inner affection (Giuliani, 2003; Hidalgo & Hernández, 2001; Williams & Vaske, 2003) and feel belongingness towards the GASPF (Bricker & Kerstetter, 2000). Therefore, they tend to preserve the place, protect it from being destroyed, and exhibit positive behaviour as best as possible (Cheng & Wu, 2014). As discussed earlier, the majority of the respondents would deter and report any behaviour damaging the GASPF. The findings are consistent with past studies which have confirmed that place attachment positively affects ERB, including Cheng and Wu (2014), Halpenny (2006), Lee (2011), Ramkissoon et al. (2013a, 2013b), and Vaske and Kobrin (2001), in which people's tendency to engage in ERB is increased when their place attachment is increased.

Apart from that, environmental sensitivity also positively influences local communities' ERB towards GASPF. This finding is aligned with past studies, including Cheng and Wu (2014), Peterson and Hungerford (1981), and Sia et al. (1986). Environmental sensitivity implies they care, appreciate, show empathy, and respect the environment (Cheng & Wu, 2014). When the local communities have positive environmental sensitivity, they tend to behave pro-environmentally by taking the initiative to learn about the environment, protect, and conserve the environment nearby to ensure their livelihood (Chawla, 1998; Cheng & Wu,

2014). Based on Table 4.7, if the local communities' environmental sensitivity increases by 1 unit, local communities' ERB towards GASPF increased by 0.206 units.

Last but not least, local communities' environmental worldview positively influences their ERB. This finding aligned with past studies (Collado et al., 2013; Kil et al., 2014; King-Chan et al., 2020; Mobley et al., 2009) where general environmental attitudes or environmental worldview measured by NEP influences ERB positively and significantly. Hence, a positive worldview likely predicts favourable behaviour towards the environment (Hines et al., 1987; King-Chan et al., 2020; Mobley et al., 2009). It implies that the local communities are likely to act environmentally responsible way when they attend to GASPF if they have a positive environmental worldview. Table 4.7 shows that the beta coefficient of environmental worldview was 0.213. It indicates that local communities' ERB would increase by 0.213 units if their environmental worldview increases by 1 unit.

In sum, multiple linear regression analysis confirmed that all three predictors, namely local communities' place attachment, environmental sensitivity, and environmental worldview, were significant in influencing local communities' ERB towards the GASPF. Figure 4.1 illustrates the final regression model generated for this study.

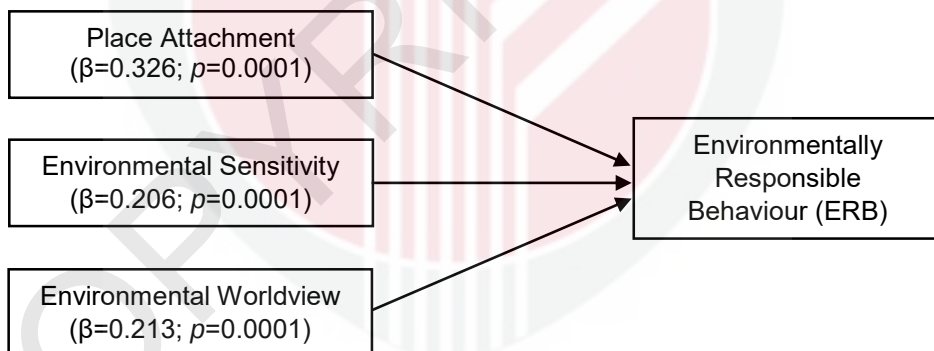


Figure 4.1: Predictors of local communities' environmentally responsible behaviour (ERB) towards Gunung Arog State Park Forest (GASPF)

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS FOR FUTURE RESEARCH

This chapter summarises the results obtained from the study. It is followed by implications of this study, which include theoretical and practical implications. The limitations of this study are clarified, and recommendations for future studies are also presented.

5.1 Summary of Results

This study is completed, and the research objectives are met. The first objective of this study was to identify the socio-demographic characteristics of the local communities living adjacent to GASPF. Data was collected from 49 respondents living at Kampung Tanjung Resang, 40 respondents from Kampung Sisek, and 71 respondents from Kampung Penyabong. Results show that more than 80.0% of the local communities have been living in their villages adjacent to GASPF for at least 11 years. Almost all of the local communities were Malay, while more than half of them were aged between 26 - 45 years and were married. The dominant highest education level attained by the local communities was secondary school. About half of the local communities were working in either government or private sectors with the most dominant gross monthly income was in the range of RM 1001 - RM 2000.

The second objective was to determine the levels of local communities' environmental worldview, environmental sensitivity, place attachment, and ERB towards GASPF. The local communities have positive levels for all variables measured. It implies that the local communities have a positive environmental worldview, are sensitive and attached to GASPF, and act environmentally responsible towards GASPF.

The third objective was to determine the correlation between environmental worldview, environmental sensitivity, place attachment, and ERB. Results indicated that all of the independent variables had a moderate positive correlation with ERB. Place attachment had the highest r coefficient with ERB ($r = .62, p < .001$), followed by environmental worldview with $r = .66, p < .001$ and environmental sensitivity with $r = .59, p < .001$.

The fourth objective was to identify the factors that influence the ERB of local communities towards GASPF. All three independent variables, namely environmental worldview, environmental sensitivity, and place attachment, were predictors of local communities' ERB towards GASPF. The effect of place

attachment was the strongest among the three, followed by environmental sensitivity and environmental worldview.

5.2 Implications of the Study

Theoretical and practical implications can be deduced based on the findings of this study. Both implications are discussed.

5.2.1 Theoretical Implications

This study has contributed to closing the gaps in the literature and enhancing our understanding of the field. First and foremost, it provides significant insights into the environmental attitudes and behaviours of people living adjacent to natural areas in Malaysia, particularly the levels of their environmental worldview, environmental sensitivity, place attachment, and environmentally responsible behaviour (ERB). This study shows that generally, local communities living adjacent to natural areas have pro-environmental worldviews, are sensitive to that area which implies they respect and care for that natural area, are attached to, and behave pro-environmentally to that area.

Although ERB has been widely discussed throughout the years, some scholars still emphasise the significance to study certain topics further (e.g., Sawitri et al., 2015; Sivek, 2002). This is particularly the case for the influence of environmental sensitivity on ERB, which lacks empirical studies. By adapting Cheng and Wu's (2014) Sustainable Tourism Behaviour Model for tourists, the framework derived in this study specifically for the local communities is statistically significant. It affirms that environmental sensitivity and environmental attitudes, including environmental worldview (general environmental attitude) and place attachment (specific environmental attitude) are significant antecedents in determining local communities' ERB, while specific environmental attitude (place attachment) is a stronger predictor than the general environmental attitude (environmental worldview). Therefore, the framework used in this study is accepted, and can be named the Local Communities' Environmentally Responsible Behaviour Model (LCERB).

This study found that the independent variables, namely environmental worldview, environmental sensitivity, and place attachment, have a significant positive correlation with the ERB. This finding verified previous studies with different target populations, which include Cheng and Wu (2014), King-Chan et al. (2020), and Mobley et al. (2009), in which their respondents were either tourists or visitors to the natural areas or merely random public.

5.2.2 Practical Implications

Policymakers and local authorities can refer to the findings of this study to formulate strategies to enhance local communities' ERB to ensure the sustainability of GASPF.

First and foremost, local communities' place attachment should be enhanced, as this study shows that place attachment is the strongest predictor of ERB. Policymakers could organise team-based outdoor activities for the local communities to enjoy together at the GASPF. This is because spending time in nature with family, friends, and neighbours could help strengthen the relationships among their neighbourhood and foster their place attachment towards GASPF in all dimensions.

For place identity, Bernardo and Palma (2005) emphasised that activities and length of time involved are among the factors for place identity development. After several engagements, when local communities realise that GASPF is a good place for their favourite outdoor activity, their place dependence towards GASPF could be enhanced (Yuksel et al., 2010). Enjoying activities with neighbours, friends, and family would create meaningful social ties and memorable experiences that strengthen their place social bonding towards GASPF (Hay, 1998; Kyle et al., 2005). Likewise, local communities' place affect on GASPF could be enhanced as place affect is the accumulation of feeling through the interaction with the setting (Eisenhauer et al., 2000).

This study found that environmental sensitivity significantly influences ERB. Thus, local authorities could organise programmes for the local communities which are not limited to picnicking, hiking, fishing, or camping at the GASPF. This is because scholars (e.g., Peterson & Hungerford, 1981; Tanner, 1980) found that such outdoor explorations or frequent visitations to nearby natural areas are significant in developing people's environmental sensitivity.

While on a larger scope, students and youth need to cultivate their awareness or care for environmental issues to develop their environmental sensitivity at an early age. Related experiences or exposure while young play a significant role in forming adults' environmental sensitivity (Tanner, 1980).

Last but not least, environmental worldview significantly influences ERB. Informative programmes such as interpretive talks and environmental walks could strengthen their environmental worldview. Therefore, local authorities could organise those activities to enhance local communities' pro-environmental worldview, educate, or raise awareness of those with a weaker pro-environmental worldview on the significance of the natural environment on human wellbeing.

5.3 Limitations and Recommendations for Future Research

This study has several limitations. Firstly, the study area was GASPF. The data were collected at the three villages adjacent to GASPF, namely Kampung Tanjung Resang, Kampung Sisek, and Kampung Penyabong. The findings might not be able to be generalised to other locations due to geographical and cultural differences. However, it is recommended to replicate this study in natural settings other than state parks or other ecotourism sites to determine the applicability of the framework used in this study.

Over 98.0% of the respondents in this study were Malay. Therefore, the findings do not represent the perceptions of other ethnicities or make conclusions for the general population. Future studies are suggested to study other ethnicities, including a larger study area with multiracial respondents, or have the respondents' proportion close to the ratio of Malaysia's ethnicity, if possible. A comparative study of local communities' perceptions of different types of natural areas could also be interesting.

This study focused only on three variables as ERB predictors: environmental worldview, environmental sensitivity, and place attachment. Thus, future studies should add other variables to test their influence on ERB to improve the understanding of ERB and increase the R^2 of the framework. Examples of variables include environmental values, perceived tourism impacts, perceived tourism development, perceived knowledge of environmental action strategies, and perceived skill in implementing environmental action strategies.

5.4 Conclusion

The sustainable development of natural areas is a global concern of leaders, policymakers, and forest managers. One of the critical components of sustainable development is local community empowerment. In this case, local communities' participation is the key to conserving natural resources. The result of this study is centered two-fold. First, it provides valuable information on the current demographic background of the local community and their environmental worldview, environmental sensitivity, place attachment, and ERB. The findings indicated that environmental sensitivity, environmental worldview, and place attachment were significant antecedents in determining local communities' ERB. Second, the findings implied that place attachment was the strongest predictor of ERB for the local community in GASP. Thus, enhancing the local communities' attachment to the GASPF could further strengthen their environmental behaviour, which is vital for the sustainable management of the GASPF. This study should benefit academics, policymakers, and resource managers to enhance the community-based conservation approach for sustainable natural resource management.

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APPENDICES

Appendix A

Survey Questionnaire



**DEPARTMENT OF NATURE PARKS AND RECREATION
FACULTY OF FORESTRY AND ENVIRONMENT
UNIVERSITI PUTRA MALAYSIA**

**Kajian Perilaku Alam Sekitar Bertanggungjawab (ERB) Komuniti
Tempatan Terhadap Hutan Taman Negeri Gunung Arong (GASPF),
Mersing, Johor**

***Study on Local Communities' Environmentally Responsible Behaviour
(ERB) towards Gunung Arong State Park Forest (GASPF), Mersing, Johor***

Enumerator : Start Time :
Date : End Time :

Kajian ini dijalankan di bawah Jabatan Taman Alam dan Rekreasi, Fakulti Perhutanan dan Alam Sekitar, Universiti Putra Malaysia (UPM). Objektif utama adalah untuk mengkaji perilaku alam sekitar bertanggungjawab (ERB) komuniti tempatan terhadap Hutan Taman Negeri Gunung Arong (GASPF), Mersing, Johor. Maklumat yang diberikan adalah sulit dan akan digunakan untuk tujuan penyelidikan sahaja. Kerjasama anda amatlah dihargai. Terima kasih.

This study is conducted under the Department of Nature Parks and Recreation, Faculty of Forestry and Environment, Universiti Putra Malaysia (UPM). The main objective is to examine local communities' environmentally responsible behaviour (ERB) towards Gunung Arong State Park Forest (GASPF), Mersing, Johor. Information given to complete this study is confidential and will be used only for research purpose. Your cooperation is very much appreciated. Thank you.

**Terima kasih. ☺
Thank you. ☺**

BAHAGIAN A: CIRI-CIRI SOSIO-DEMOGRAFI
SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Sila tandakan (I) atau isi jawapan anda di tempat yang disediakan.
 Please tick (I) or fill your answer in the space provided.

1. Kampung kediaman sekarang / Currently living in village:

Tanjung Resang ☐ Sisek ☐ Penyabong ☐

2. Tempoh tinggal / Years of living: _____ tahun / years

3. Jantina / Gender:

Lelaki / Male ☐ Perempuan / Female ☐

4. Umur / Age: _____ tahun / year old

5. Status perkahwinan / Marital status:

Bujang / Single ☐ Berkahwin / Married ☐
 Cerai / Divorced ☐

6. Etnik / Ethnicity:

Melayu / Malay ☐ India / Indian ☐
 Cina / Chinese ☐
 Lain-lain / Others. Sila nyatakan / Please state: _____

7. Agama / Religion:

Islam ☐ Kristian / Christian ☐
 Buddha / Buddhism ☐ Hindu / Hinduism ☐
 Lain-lain / Others. Sila nyatakan / Please state: _____

8. Tahap Pendidikan / Education level:

Pendidikan Tidak Formal / Informal Education ☐
 Sekolah Rendah / Primary School ☐
 Sekolah Menengah / Secondary School ☐
 STPM dan Sijil / STPM and Certificate ☐
 Diploma / Diploma ☐
 Ijazah Sarjana Muda / Bachelor Degree ☐
 Ijazah Sarjana / Master Degree ☐
 PhD / Doctor of Philosophy ☐
 Lain-lain / Others. Sila nyatakan / Please state: _____

9. Pekerjaan / Occupation:

Pelajar / Student

Bersara / Retired

Surirumah / Housewife

Lain-lain / Others. Sila nyatakan / Please state:

☐

Bekerja sendiri / Self-employed

☐

Sektor kerajaan / Government sector

☐

Sektor swasta / Private sector

☐☐☐

10. Anggaran gaji kasar sebulan / Gross monthly income:

BAHAGIAN B: PANDANGAN TERHADAP ALAM SEKITAR SECTION B: ENVIRONMENTAL WORLDVIEW

Nyatakan sejauh mana anda bersetuju atau tidak bersetuju dengan pernyataan berikut.

Indicate the degree to which you agree or disagree with the following statements.

1	2	3	4	5
Sangat Tidak Setuju / Strongly Disagree	Tidak Setuju / Disagree	Neutral / Neutral	Setuju / Agree	Sangat Setuju / Strongly Agree

	Statements	1	2	3	4	5
1.	Kita menghampiri had jumlah orang yang bumi dapat tampung. <i>We are approaching the limit of the number of people the earth can support.</i>					
2.	Manusia berhak mengubah persekitaran semula jadi untuk sesuai dengan keperluan mereka. <i>Humans have the right to modify the natural environment to suit their needs.</i>					
3.	Apabila manusia mengganggu alam, ia sering menghasilkan akibat yang buruk. <i>When humans interfere with nature it often produces disastrous consequences.</i>					
4.	Kepintaran manusia akan memastikan bahawa kita tidak menjadikan bumi tempat yang tidak dapat didiami. <i>Human ingenuity will insure that we do not make the earth unlivable.</i>					

5.	Manusia menyalahgunakan persekitaran. <i>Humans are severely abusing the environment.</i>					
6.	Bumi mempunyai banyak sumber semula jadi jika kita belajar bagaimana membangunkannya. <i>The earth has plenty of natural resources if we just learn how to develop them.</i>					
7.	Tumbuhan dan haiwan mempunyai hak yang sama seperti manusia untuk wujud. <i>Plants and animals have as much right as humans to exist.</i>					
8.	Keseimbangan alam cukup kuat untuk mengatasi kesan perindustrian moden negara. <i>The balance of nature is strong enough to cope with the impacts of modern industrial nations.</i>					
9.	Di sebalik kemampuan khas kita, manusia masih tunduk pada hukum alam. <i>Despite our special abilities, humans are still subject to the laws of nature.</i>					
10.	Apa yang disebut "krisis ekologi" yang dihadapi umat manusia telah dibesar-besarkan. <i>The so-called "ecological crisis" facing humankind has been greatly exaggerated.</i>					
11.	Bumi adalah seperti kapal angkasa dengan ruang dan sumber yang sangat terhad. <i>The earth is like a spaceship with very limited room and resources.</i>					
12.	Manusia dimaksudkan untuk memerintah alam. <i>Humans were meant to rule over the rest of nature.</i>					
13.	Keseimbangan alam sangat lemah dan mudah terganggu. <i>The balance of nature is very delicate and easily upset.</i>					
14.	Akhirnya, manusia akan belajar tentang bagaimana alam berfungsi untuk mengawalinya.					

	<i>Humans will eventually learn enough about how nature works to be able to control it.</i>					
15.	Sekiranya keadaan berterusan seperti sekarang, kita akan mengalami bencana ekologi yang besar. <i>If things continue on their present course, we will soon experience a major ecological catastrophe.</i>					

BAHAGIAN C: KEPEKAAN TERHADAP ALAM SEKITAR SECTION C: ENVIRONMENTAL SENSITIVITY

Nyatakan sejauh mana anda bersetuju atau tidak bersetuju dengan pernyataan berikut.

Indicate the degree to which you agree or disagree with the following statements.

1	2	3	4	5
Sangat Tidak Setuju / <i>Strongly Disagree</i>	Tidak Setuju / <i>Disagree</i>	Neutral / <i>Neutral</i>	Setuju / <i>Agree</i>	Sangat Setuju / <i>Strongly Agree</i>

	Statements	1	2	3	4	5
1.	Saya menikmati persekitaran semula jadi. <i>I enjoy natural environments.</i>					
2.	Saya prihatin dengan pemeliharaan ekologi di Hutan Taman Negeri Gunung Arong (GASPF). <i>I am concerned about the ecological preservation in Gunung Arong State Park Forest (GASPF).</i>					
3.	Saya menghargai persekitaran semula jadi GASPF. <i>I appreciate the natural environment of GASPF.</i>					
4.	Saya mengambil berat tentang kesan tabiat hidup saya pada persekitaran semula jadi GASPF. <i>I care about the impact of my living habits on the natural environments of GASPF.</i>					

BAHAGIAN D: PERTAUTAN TEMPAT TERHADAP HUTAN TAMAN NEGERI GUNUNG ARONG (GASPF)
SECTION D: PLACE ATTACHMENT TOWARDS GUNUNG ARONG STATE PARK FOREST (GASPF)

Nyatakan sejauh mana anda bersetuju atau tidak bersetuju dengan pernyataan berikut.

Indicate the degree to which you agree or disagree with the following statements.

1	2	3	4	5
Sangat Tidak Setuju / <i>Strongly Disagree</i>	Tidak Setuju / <i>Disagree</i>	Neutral / <i>Neutral</i>	Setuju / <i>Agree</i>	Sangat Setuju / <i>Strongly Agree</i>

	Statements	1	2	3	4	5
1.	Saya rasa GASPF adalah sebahagian daripada diri saya. <i>I feel GASPF is a part of me.</i>					
2.	Saya sangat terhubung dengan GASPF. <i>I identify strongly with GASPF.</i>					
3.	Tinggal di sekitar GASPF banyak mengatakan siapa saya. <i>Living around GASPF says a lot about who I am.</i>					
4.	Untuk apa yang paling saya nikmati, kawasan dan kemudahan yang disediakan oleh GASPF adalah yang terbaik. <i>For what I enjoy most, the settings and facilities provided by GASPF are the best.</i>					
5.	Untuk apa yang saya suka lakukan, saya tidak dapat membayangkan sesuatu yang lebih baik daripada kawasan dan kemudahan yang disediakan oleh GASPF. <i>For what I like to do, I could not imagine anything better than the settings and facilities provided by GASPF.</i>					
6.	Saya lebih menikmati tinggal di sekitar GASPF dan persekitarannya daripada tempat lain. <i>I enjoy living around GASPF and its environment more than any other places.</i>					

7.	Rakan/keluarga saya akan kecewa sekiranya saya mula tinggal di tempat lain. <i>My friends/family would be disappointed if I were to start living at other places.</i>					
8.	Sekiranya saya berhenti tinggal di sekitar GASPF, hubungan saya dengan sebilangan rakan saya akan terputus. <i>If I were to stop living around GASPF, I would lose contact with a number of friends.</i>					
9.	Rakan-rakan/keluarga saya lebih suka GASPF daripada tempat lain. <i>Many of my friends/family prefer GASPF over other places.</i>					
10.	GASPF sangat bermakna kepada saya. <i>GASPF means a lot to me.</i>					
11.	Saya sangat terikat dengan GASPF. <i>I am very attached to GASPF.</i>					
12.	Saya mempunyai rasa kepunyaan yang kuat terhadap GASPF. <i>I feel strong sense of belonging to GASPF.</i>					

BAHAGIAN E: PERILAKU ALAM SEKITAR BERTANGGUNGJAWAB (ERB) TERHADAP HUTAN TAMAN NEGERI GUNUNG ARONG (GASPF)
SECTION E: ENVIRONMENTALLY RESPONSIBLE BEHAVIOUR (ERB) TOWARDS GUNUNG ARONG STATE PARK FOREST (GASPF)

Nyatakan sejauh mana anda bersetuju atau tidak bersetuju dengan pernyataan berikut.

Indicate the degree to which you agree or disagree with the following statements.

1	2	3	4	5
Sangat Tidak Setuju / <i>Strongly Disagree</i>	Tidak Setuju / <i>Disagree</i>	Neutral / <i>Neutral</i>	Setuju / <i>Agree</i>	Sangat Setuju / <i>Strongly Agree</i>

	Statements	1	2	3	4	5
1.	Saya cuba menyelesaikan masalah alam sekitar di GASPF. <i>I try to solve the environmental problems in GASPF.</i>					

2.	Saya membaca laporan, buku, dan bahan-bahan lain yang berkaitan dengan persekitaran GASPF. <i>I read reports, books, and other materials related to the environments of GASPF.</i>					
3.	Saya berbincang dengan orang lain mengenai perlindungan alam sekitar GASPF. <i>I discuss with others about environmental protection of GASPF.</i>					
4.	Saya cuba meyakinkan para sahabat untuk menerapkan perilaku positif dalam persekitaran semula jadi GASPF. <i>I try to convince companions to adopt positive behaviours in the natural environments of GASPF.</i>					
5.	Apabila saya nampak perilaku alam sekitar orang lain yang kurang bagus di GASPF, saya akan melaporkannya kepada pihak berkuasa. <i>When I see others' inadequate environmental behaviour in GASPF, I will report it to the authorities.</i>					
6.	Menurut undang-undang, saya akan mencegah sebarang perilaku yang merosakkan persekitaran GASPF. <i>According to the law, I will deter any behaviour damaging the environment of GASPF.</i>					
7.	Saya mengutip sampah dan ranting jika saya melihatnya di GASPF. <i>I pick up trash and branches when I see them in GASPF.</i>					
8.	Saya mengambil bahagian dalam aktiviti membersihkan GASPF. <i>I participate in activities to clean GASPF.</i>					

Appendix B

Correlation Analysis Results

Correlations		EW_ Mean	ES_ Mean	PA_ Mean	ERB_ Mean
EW_ Mean	Pearson Correlation	1	.457**	.620**	.618**
	Sig. (2-tailed)		.000	.000	.000
	N	160	160	160	160
ES_ Mean	Pearson Correlation	.457**	1	.464**	.586**
	Sig. (2-tailed)	.000		.000	.000
	N	160	160	160	160
PA_ Mean	Pearson Correlation	.620**	.464**	1	.660**
	Sig. (2-tailed)	.000	.000		.000
	N	160	160	160	160
ERB_ Mean	Pearson Correlation	.618**	.586**	.660**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	160	160	160	160

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix C

Multiple Linear Regression Analysis Results

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	PA_Mean, ES_Mean, EW_Mean ^b	.	Enter

a. Dependent Variable: ERB_Mean

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757 ^a	.573	.565	.19343

a. Predictors: (Constant), PA_Mean, ES_Mean, EW_Mean

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.835	3	2.612	69.803	.000 ^b
Residual	5.837	156	.037		
Total	13.671	159			

a. Dependent Variable: ERB_Mean

b. Predictors: (Constant), PA_Mean, ES_Mean, EW_Mean

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.242	.201		6.185	.000
EW_Mean	.213	.057	.256	3.722	.000
ES_Mean	.206	.042	.302	4.955	.000
PA_Mean	.326	.062	.361	5.229	.000

a. Dependent Variable: ERB_Mean

BIODATA OF STUDENT

Siti Dessyma Binti Isnani was born on 25th September 1975, in Kuching, Sarawak, Malaysia. She started her education at Sekolah Rendah Kerajaan Abang Haji Matahir Sarikei, Sarawak for primary school education and obtained her Ujian Penilaian Sekolah Rendah (UPSR) in 1987. After that, she continued her secondary school education at Sekolah Menengah Kerajaan Agama, Sibu where she attained her Sijil Rendah Pelajaran (SRP) and Sijil Pelajaran Malaysia (SPM). Then, she furthered her study at Universiti Putra Malaysia (UPM) for Diploma programme in Forestry. After that, she furthered her Bachelor of Science Forestry Management at UPM. She started her first job at a private company in logging industry, Kuching from 1999 to 2000. Then, she started to work at Peninsular Malaysia Forestry Department as a forest conservator since 2001. Now, she is a candidate for Master of Science degree under Faculty of Forestry at UPM when she got offer from JPA to pursue her postgraduate studies.

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