



UNIVERSITI PUTRA MALAYSIA

**EVALUATION OF LOCAL COMMUNITY KNOWLEDGE, AWARENESS
AND WILLINGNESS TO PARTICIPATE IN CONSERVATION OF RIVER
TERRAPIN IN PERAK RIVER, MALAYSIA**

MUHAMMAD FARHAN BIN ABDUL RAHMAN

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By

MUHAMMAD FARHAN BIN ABDUL RAHMAN

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

October 2017

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

EVALUATION OF LOCAL COMMUNITY KNOWLEDGE, AWARENESS AND WILLINGNESS TO PARTICIPATE IN CONSERVATION OF RIVER TERRAPIN IN PERAK RIVER, MALAYSIA

By

MUHAMMAD FARHAN BIN ABDUL RAHMAN

October 2017

Chairman : Associate Professor Latifah Abd Manaf, PhD
Faculty : Environmental Studies

Malaysia is the largest last stronghold of wild river terrapin in the world habituating river throughout Peninsular Malaysia. However, recent trends show the declining of nesting female in Bota Kanan, Perak which on 2005, it is recorded only 25 female landed laying eggs during the season ended in February. Typical conservation approach program should be upgraded with the involvement of local community in order to increase the population. In attempt to understand the community, the local community will be assessed in term of their knowledge, awareness, and willingness to participate in the conservation of river terrapin in Perak River, Malaysia. A questionnaire was design and conducted at the Perak Tengah district in Mukim Bota specifically at Kampung Bota Kanan. Considering the population size of 26,552 people, the minimum recommended sample size for this study would be 394 person at 95% confidence level. The sampling was conducted from June to December 2016 after it was pretested in Mei 2016. Collected survey responses were coded in Statistical Package for the Social Science (SPSS) and simple descriptive statistic was run. In addition, Principal Component Analysis (PCA) was also conducted. As a results, community at Bota Kanan, Perak have a good knowledge and awareness regarding the decline population of river terrapin but poor in the deeper knowledge as they did not know the nesting season and distribution of this species in Malaysia. Majority of them agree that the conservation center lack in organizing the awareness event for public and need to be upgraded and they show lack of interest to visit the conservation centre. People at Bota Kanan show a positive feedback regarding the willingness to participate in the conservation program as they will keep the Perak River clean, feel responsible to conserve terrapin and reported any illegal activities related to river terrapin. For the information transfer among community part Facebook is the most assess social media, Sinar Harian is the most preferable newspaper, TV3 is the channel with the highest rating, and Perak fm. is the main channel to listen. For the correlation part, it is show that younger person is more interested to join the conservation

programme compared to the older person, education levels did not have correlation with the level of knowledge, education level have a significant correlation to willingness to participate and long-time resident know that river terrapin habituating Perak River instead of younger person which did not really know about the species. The good knowledge and awareness of the local communities will result the positive feedback on willingness to participate in the conservation programme as 95% of the respondents willing to maintain the cleanness of the river while 87% of them feel responsibility to conserve the species and 84% willing to make a report regarding any illegal activities on river terrapin. As the conclusion, managing river terrapin conservation for a long period of time is crucial to have more knowledgeable community thus build strong awareness to sustain the programme.

Keywords: River Terrapin; *Batagur affinis*, conservation; knowledge; awareness;

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**PENGLIBATAN MASYARAKAT SETEMPAT DALAM PROGRAM
PEMULIHARAAN TUNTUNG DI SUNGAI PERAK, MALAYSIA**

Oleh

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Fakulti : Pengajian Alam Sekitar

Malaysia adalah habitat terbesar dan terakhir bagi tuntung sungai liar di dunia mendiami sungai-sungai di semenanjung Malaysia. Namun, trend terkini menunjukkan penurunan jumlah tuntung sungai betina yang bertelur di Kampong Bota Kanan, Perak dimana pada tahun 2005 rekod mendapati hanya 25 ekor tuntung betina yang mendarat untuk bertelur semasa musim bertelur yang berakhir pada bulan Februari. Pendekatan biasa dalam usaha pemuliharaan patut di tingkatkan dengan melibatkan penduduk setempat supaya populasi tuntung bertambah. Satu kaji selidik telah dirangka dan dijalankan di Daerah Perak Tengah lebih tepat lagi Kampong Bota Kanan. Dengan mengambil kira saiz populasi seramai 26, 552 orang, kajian ini memerlukan seramai 394 orang respondent dengan tahap keyakinan 95%. Kajian ini dijalankan dari Jun sehingga Disember 2016 selepas diuji pada bulan Mei 2016. Data yang diperolehi dimasukkan kedalam *Statistical Package for the Social Science (SPSS)* dan analisis deskriptif mudah dijalankan. Tambahan, analisis menggunakan *Principal Component Analysis (PCA)* turut dijalankan. Keputusan kajian menunjukkan komuniti di Bota Kanan, Perak mempunyai pengetahuan dan kesedaran yang baik terhadap penurunan populasi tuntung tetapi lemah dalam pengetahuan yang lebih mendalam tentang tuntung contohnya mereka tidak mengetahui musim tuntung bertelur dan taburan spesis ini di Malaysia. Kebanyakan dari mereka juga bersetuju tentang peranan pusat pemuliharaan yang jarang untuk menganjurkan program kesedaran dan patut ditingkatkan kerana masyarakat setempat menunjukkan minat yang rendah untuk melawat pusat pemuliharaan tersebut. Masyarakat di Bota Kanan menunjukkan tindak balas yang positif terhadap kesanggupan untuk menyertai program pemuliharaan dimana mereka bersedia untuk menjaga kebersihan Sungai Perak dan melaporkan sebarang aktiviti yang salah berkenaan tuntung. Untuk bahagian perpindahan maklumat, *Facebook* adalah laman sosial yang selalu di akses, *Sinar Harian* adalah surat khabar yang diminati, *TV3* ialah saluran television yang selalu dipilih, *Perak fm* adalah saluran radio yang menjadi pilihan pendengar. Pada bahagian *Correlation Analysis*, golongan muda lebih menunjukkan minat untuk menyertai program

konservasi berbanding golongan lebih tua, tahap pembelajaran tidak ada hubungan dengan tahan pengetahuan, tahap pembelajaran ada hubungan beerti dengan kesudian untuk menyertai program dan penduduk yang lebih lama tinggal di Bota Kanan mengetahui berkenaan tuntung berbanding golongan muda. Pengetahuan dan kesedaran yang baik akan menghasilkan maklumbalas yang positif untuk menyertai program pemuliharaan dimana 95% respondent bersetuju untuk menjaga kebersihan sungai, 87% pula rasa bertanggungjawab untuk memulihara spesies ini dan 84% sanggup untuk melaporkan sebarang aktiviti salah yang melibatkan tuntung. Kesimpulannya, pengurusan pemuliharaan untuk jangka masa lama adalah penting untuk mempunyai masyarakat yang berpengetahuan seterusnya membina kesedaran yang kuat untuk menjamin kelangsungan program.

Keywords: Tuntung Sungai; *Batagur affinis*; Pemuliharaan; Pengetahuan; Kesedaran.

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Thank you.



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Committee:

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LIST OF ABBREVIATIONS

DWNP	Department Of Wildlife And National Park, Malaysia
WWF-MALAYSIA	World Wild Fund
WCC	Wildlife Conservation Centre
TCS	Turtle Conservation Society
PCA	Principal Component Analysis
IUCN	International Union For Conservation Of Nature
TCM	Traditional Chinese Medicine
CITES	Convention On International Trade In Endangered Species Of Wild Fauna And Flora

CHAPTER 1

INTRODUCTION

1.1 Background of study

By the year 2050, world population is expected to reach 9.7 billion people with the most growth generated in developing region especially in most African countries (United Nations, 2015). People in developing countries tend to have high fertility rate while most people live longer in developed countries due to good health condition which contributes to the increasing number of total human population (WHO, 2011). The increase of population gives direct impact to the ecosystem which accelerates biodiversity loss, climate change, environmental stress and unsustainable utilization of natural resources (McDougall, 2009). The world has lost 7 million hectares of forest and it is being replaced by the increase of agricultural land more than 6 million hectares annually from 2000 to 2010 (Martin *et al.*, 2016). Demand in agriculture activities gives serious impact to the freshwater resources, enabling the emerging of new problems including contamination, diseases, and destruction and degradation of freshwater ecosystems (Gleick *et al.*, 2001).

Freshwater ecosystem only make up 0.01% of the world's water but supports up to 6% of known species out of approximately 1.8 million worldwide thus destruction and degradation of freshwater ecosystems will threaten biodiversity (Dudgeon *et al.*, 2006). Freshwater turtle and tortoise is the most threatened vertebrate species all over the world worse than birds, bony fish, mammals and other vertebrate (Hoffmann *et al.*, 2010). With the unsustainable development in most of the developing countries, degradation of land and river had become major threat to the chelonian species. Besides being threatened by the unsustainable development, freshwater turtle and tortoise are being traded in most Asian countries especially China as a main importer as they are considered as food item with perceived health and medicinal benefits and exported to United States as well to the European Union as a pet where these species are wildly caught in Southeast Asian region including Cambodia, Indonesia and Malaysia (Dijk, 2000).

With all the threat surrounding this species, conservation is very crucial in order to sustain the population. In Malaysia, conservation of wildlife including freshwater species are managed by the Department of Wildlife and National Parks (DWNP). This government agency is responsible to protect, manage and preserve biodiversity, developing protected areas for research, education, economic, aesthetic, recreational and ecological purposes as well as for the enhancement of knowledge, awareness and public support on the needs and importance of biodiversity conservation (DWNP, 2014). Besides DWNP, effort of conservation of wildlife in Malaysia is supported by numerous non-government agencies such as WWF Malaysia as in the WWF-Malaysia Strategy 2012 to 2020 covers various fields from terrestrial and marine conservation as well as policy and education (WWF-Malaysia, 2012). In addition, Turtle

Conservation Society plays a big role in protecting chelonian species in Malaysia especially freshwater turtle and tortoise.

Conservation of freshwater turtle and tortoise exclusively river terrapin (*Batagur affinis*) had been initiated by DWNP since 1968 with the establishment of the first Wildlife Conservation Centre (WCC) for river terrapin at Bota Kanan, Perak. It is then followed by the establishment of two other WCC for river terrapin at Kuala Berang, Terengganu in 1976 and Bukit Pinang, Kedah in 1982 in which a total of 395 River Terrapins and 16 Painted Terrapins are kept in Bota Kanan WCC, 221 River Terrapins and 80 Painted Terrapins are kept in Bukit Pinang WCC, while 823 River Terrapins are kept in Kuala Berang WCC (DWNP, 2010). These conservation centres play a virtue role involving egg protection, head starting and reintroduction program to increase the population. Furthermore, TCS-Malaysia an NGO had begun to conserve river terrapin since 2012 and shows promising success with the reintroduction of 1,690 *Batagur affinis* juveniles into the river with the involvement of local community in the conservation programme (Chen, 2017).

Community based participation in conservation programme had long being applied especially in the sea turtle conservation effort. On Vamizi Island, Mozambique the community had facilitated the identification and protection of nesting site for the green marine turtle *Chelonia mydas* (Garnier *et al.*, 2012). While in Nellore district, Andhra Pradesh, India the participation of local community in sea turtle conservation had help to increase the nest protection resulting in the extension of the project to nearby coastal area (Dharini and Muralidharan, 2012). In Malaysia, the involvement of local community in wildlife conservation is a new approach which needs deeper study to understand the responses of community towards the programme. It is crucial to understand their willingness to participate in the programme as it is normally restrained by human-wildlife conflicts, and it varies with the low income community, but somehow certain communities show a positive feedback if their involvement could create economic, socio-cultural, institutional, and political benefits (Daim *et al.*, 2012).

1.2 Problem statement

Malaysia is the largest last stronghold of wild river terrapin in the world habituating river throughout Peninsular Malaysia (The Star, 2005). Research by Moll *et al.*, (2015) shows that Malaysia has two distinct species of *Batagur* that adds up to the diversity of this species' existence in Perak and Terengganu river basin. Large population of wild *Batagur affinis* only exist in Malaysia and it's ranked as 25 most endangered turtle species in the world (Rhodin *et al.*, 2011).

However, recent trends show the decline of nesting female in Bota Kanan, Perak which in 2005, it was recorded as only 25 female landed to lay eggs after the season ended in February (The Star, 2005). In 2016, recent scientific research by University Putra Malaysia had observed only 2 nesting female landed at Bota Kanan on the

nesting season between Januarys until March (Utusan Malaysia, 2017). This trend shows that sandbanks at Bota Kanan are not preferred by terrapin to become their nesting site due to habitat alteration.

River terrapin choose specific sandbanks for their nesting location. Thus, any activities that changes the morphology of the riverbanks will affect their behaviour. Sand mining and agricultural activities on the riverbanks give a huge impact to their behaviour. State Wildlife and National Parks Department director Mohd Nawayai Yasak said “The low population of river terrapins was largely due to sand mining activities along Sungai Perak” (The Star, 2012). While in Kemaman Terengganu, sand mining activities especially at the nesting location affect their landings. (Sinar Harian, 2016).

In addition, poor condition of Wildlife Conservation Centre Bota Kanan, Perak has made the conservation effort worse. Visitors had made complaints about the conservation centre having bad condition to conserve endangered species. Albert Low, who visited the facility with his wife Michelle Boey said, “The ponds where breeding terrapins were kept were murky and smelly, the water was almost black with a layer of scum on top and the ponds have not been cleaned for a while” (The Star, 2011).

Besides, the successfulness of conservation programme needs the involvement of local community as well. Polluted river due to habits of disposing household waste into the river especially in places which local authority did not make waste collection accelerates this problem. Chicken and pig farm as well as rubber plantation on Perak river side also affect the water quality as discharge often contain chemical, biological waste and bacteria that can alter the ecosystem (Sinar Harian, 2017) Moreover, fishermen whom accidentally caught river terrapins in their gill net often kill the species (Senko, *et al.*, 2011). Agricultural farming along the riverside often use chemical that also threats terrapin (The Star, 2016).

Thus, typical ex-situ conservation approach program should be upgraded with the involvement of local community in order to increase the population. The success of such conservation program is not only reliant on the collection of ecological information, but equally on public obedience to the protection programs (Vincenot *et al.*, 2015). To ensure public obedience towards protection of river terrapins, policies are the very important tools which involve multi organisation such as government sectors, local leaders, and NGO’s to collaborate to the protection of river terrapins by having same vision and principle in many aspects from utilization of the natural resources at local area, development of industrial and agriculture activities, town planning, waste management practice, and conservation of river and terrapins itself. A single and comprehensive law that caters for the sustainable management of biodiversity in Malaysia, to be followed with an equally single administrative agency as custodian to the law, may perhaps become the solution to guarantee effective implementation and enforcement of such a law as of now, there is no single unified and comprehensive federal legislation to deal with the management, safe and sustainable use of biological resources where the existing piecemeal legislations are still segmented and sector –based (Talaat, 2013).

1.3 Research objectives

The main objective in this study is to assess the local community-based participation for conservation of river terrapin in Perak River, Malaysia. In order to achieve this main objective, three specific objectives have been determined:

1. To evaluate the knowledge and awareness of the community towards river terrapin and the roles of the conservation centre.
2. To determine the willingness to participate of community towards conservation of river terrapin and the best medium for information transfer between communities.
3. To identify factors influencing community participation towards conservation of river terrapin.

1.4 Research questions

In line with the first objectives this study seeks to investigate the following research questions:

- i) Do peoples living along the Perak River are aware of the existence of river terrapin?
- ii) Do they had saw them and can differentiate them from tortoise and turtle?
- iii) Are the conservation centre is effective to conserve the terrapin?

With respect to the second objective this study seeks to identify several factors that influence them towards conservation programme.

- i) Are you willing to involve in the conservation program?
- ii) What is the best medium for information transfer for the purpose of conservation program?

Last but not least, the third objective is to identify the significant factors influencing community in the conservation of river terrapin. Thus the final research question is as follows:

- i) What are the significant factors influencing community in the conservation of river terrapin.

1.5 Scope of Study

To apply community based conservation, most studies only focused on the community knowledge, awareness, and willingness to participate even though there is a need to highlight other issues such as threat which normally become conflicts between community and wildlife. Besides, to have a sustainable conservation programme, information needs to be delivered correctly to the targeted community in order to build good knowledge and awareness among them.

Basically this research attempts to study community perception towards conservation of river terrapin at Bota Kanan, Perak based on their knowledge, awareness and threat particularly. Moreover, this study also attempts to access the effectiveness of river terrapin Conservation Centre and method of receiving information among community towards river terrapin in Perak, Malaysia to strengthen the factors of their involvement in the conservation program.

With the good training and knowledge transfer between researchers and community, they are able to conduct and develop their own conservation program. The local communities must be trained to be stewards of their natural resources (Horwich & Lyon 2007). One of the most successful terrapin conservation program with the involvement of community happened in Kemaman, Terangganu which the formation of a group of "Terrapin Guardians". Although they are not very highly educated, through effective knowledge transfer, they were able to follow instructions and perform scientific tasks in the absence of a researcher. This supports the assumption that the local community can be trained to be responsible over their own natural resources which his case of study become the main reference to develop B. affinis conservation projects in Perak.

1.6 Significance of study

Human-wildlife conflicts have many complex causes rooted in social, economic, cultural, and political structures. A solution is needed to address these factors by understanding the people who lives in the population circumstances. This research provides an overview on the knowledge and awareness of community in Bota Kanan, Perak as a base understanding regarding conservation of river terrapin. Good knowledge and awareness of the community normally results in the good attitude of participating in the conservation program. It is hoped that this new way of conservation approach can be applied in Perak as the recent growth in human-animal conflicts primarily driven by poor understanding of the local community and solutions that seek to reduce the conflicts are critical to solve the problem.

Besides knowledge and awareness, factors that threaten river terrapin need to be understood comprehensively. Data from this study will expose the threat at the very basic level. Besides, it will also help in clarifying the typical threat among chelonian species faced by river terrapin at Perak. Typical threat as being eaten by community,

traded as pet and killed by farmers and fisherman will be exposed in this study thus a supreme conservation measure can be made to build a sustainable conservation program.

Hence, it is essential to apply community-based participation approach in the river terrapin conservation program in which valuable data and information gathered from the local communities who live along the river can be used to review current status and will also benefit them socially and economically. The main challenge in conservation programme with the involvement of local community is that it is lacking in compliance from other parties thus it is crucial to look forward to the point of views from the community. Demographic variables like age, gender, and socio-economic factors such as education, occupation, income, environmental wellbeing, awareness, and social issues have positive significant impact on attitudes towards environmental conservation behaviour (Masud and Kari, 2015).

1.7 Thesis organisation

Overall, this thesis consists of five chapters to assist in understanding and to follow with ease, the organisation of the writing process. The chapters in this thesis have been organize as follows.

Chapter 2 is about the literature review concerning research conducting critical review of the scientific literature review on the various aspects on conservation of turtle and tortoise all over the world. An overview of opportunities to applying the technique and method of conservation for Malaysian species, how to overcome the challenge in the human-wildlife conflict especially for the conservation of river terrapin, participation of local community to make sure that the programme can maintain for a long period of time thus increase and maintaining the population and factors of the local community participation in the programme.

The following Chapter 3 describe the methodology of data collection and analytical framework in this research. Several aspect of the methodology would be highlighted and discuss in this chapter.

The Chapter 4 focus on the findings of research and its further detailed data analysis and discussion. In this chapter, the results of sampling would be discuss in further elaborations with the results of the application of methodology proposed in the previous chapter.

Chapter 5 summarize major findings and conclude the research followed by several recommendations for further research and implementations. This chapter concludes the major findings in a concise and clear manner.

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BIODATA OF STUDENT

Muhammad Farhan bin Abdul Rahman has his early education in Sekolah Kebangsaan Clifford, Kuala Lipis Pahang from 1997 to 2002, and continued his secondary education in Sekolah Menengah Sains Tengku Abdullah, Raub Pahang. He then further his studies to higher education at Pahang Matriculation College and pursue bachelor degree in Environmental Management at Universiti Putra Malaysia in 2014. He further his studies to master's degree at UPM specializing in social studies. His interest include wildlife management and social science.





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