



**ASSESSMENT OF SOCIAL DEMAND FOR
CONSERVATION AND DEVELOPMENT AREAS
IN DELTA TUMPAT, KELANTAN.**

by

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A report submitted in fulfilment of the requirements for the degree of
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DECLARATION

I declare that this thesis entitled “Assessment of Social Demand for Conservation and Development Areas in Delta Tumpat, Kelantan” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Assessment of Social Demand for Conservation and Development Areas in Delta Tumpat, Kelantan

ABSTRACT

Development is often a guideline for the standards living of the local population while conservation aspect cannot be underestimated because it plays a role for maintain the sustainability for economy and environment. Kelantan Delta plays an important role in terms of social, economic and environment. The society demand on development and conservation in Delta Kelantan is rarely known. The objective of this study is to determine the social demand for conservation and development areas of the Delta Tumpat. This study was conducted from September 2016 until October 2016. 120 sets of questionnaires were distributed to the local communities at different places such as Kok Majid, Bandar Tumpat, Pantai Sri Tujoh, and Teluk Renjuna. The study revealed that 37% of respondents agreed to conserve the delta area and 9% of respondents were strongly agreed to develop Delta Tumpat. Meanwhile, 52% of respondents chose both conserve and develop the delta area.

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Assessment of Social Demand for Conservation and Development Areas in Delta Tumpat, Kelantan

ABSTRAK

Pembangunan sering menjadi garis panduan bagi taraf hidup penduduk tempatan manakala aspek pemuliharaan tidak boleh dipandang ringan kerana ia memainkan peranan untuk mengekalkan kemampanan ekonomi dan alam sekitar. Delta Kelantan memainkan peranan yang penting dari segi sosial, ekonomi dan alam sekitar. Permintaan masyarakat mengenai pembangunan dan pemuliharaan di Delta Kelantan jarang diketahui. Objektif kajian ini adalah untuk menentukan permintaan sosial bagi pemuliharaan dan pembangunan kawasan di Delta Tumpat. Kajian ini dijalankan dari September 2016 hingga Oktober 2016. 120 set soal selidik telah diedarkan kepada masyarakat tempatan di tempat-tempat yang berbeza seperti Kok Majid, Bandar Tumpat, Pantai Sri Tujoh, dan Teluk Renjuna. Kajian menunjukkan bahawa 37% daripada responden bersetuju untuk memulihara kawasan delta dan 9% daripada responden sangat bersetuju untuk membangunkan Delta Tumpat. Sementara itu, 52% daripada responden memilih kedua-dua memulihara dan membangunkan kawasan delta.

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LIST OF ABBREVIATIONS

MMFR	- Matang Mangrove Forest Reserve
NFP	- National Forestry Policy
PFR	- Permanent Reserved Forest
SPSS	- Statistical Package for the Social Sciences
WTP	- Willingness to Pay



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LIST OF SYMBOLS

%	- percentage
ha	- hectares
km	- kilometre
RM	- Ringgit Malaysia
N	- North
E	- East
°	- Degree



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CHAPTER 1

INTRODUCTION

1.1 Background Study

Mangrove forests are a unique ecosystem generally found along sheltered coasts where it grow abundantly in saline soil and brackish water subject to periodic fresh- and salt-water inundation that rich with flora and fauna. Malaysia's mangroves have declined over 45% from an estimated 1.1 million hectares to the current estimate of 564,970 hectares (Akashah *et al.*, 2014).

Kelantan Delta is the only delta in the state of Kelantan (Dony *et al.*, 2013) and it is located on the east coast of Peninsular Malaysia, and is exposed to strong wave action, especially during the monsoon season on November to February every year. This delta plays an important role in mangrove forest ecosystem and has its own contribution in terms of social, economic and environment.

Healthy mangrove forests, which are uniquely adapted to withstand the force of tides, may be able to absorb the energy of the waves. Thus, they have the ability to protect local communities and coastal resources by providing barriers to storm surges, cyclones, and other extreme weather events in the term protected from natural disaster. This situation shows the mangroves forest is very important to hold the north-east monsoon, which occurs in Kelantan on November until February every year (Kamal *et al.*, 1997).

Although many services and benefits provided by mangroves, coastal forests have long been undervalued and seen as wasteland and only act as a source of local economic short-term interests (Richard *et al.*, 2009). The use of direct value is the

value that is obtained directly from the use of natural resources around as recreation, tourism, harvesting of natural resources, hunting rich in natural resources, education and research. Only the direct use such as hunting and harvesting of natural resources are usually done by people in the area of mangrove forests.

On economy aspect, an international port will be built in Tumpat, Kelantan is expected to pave the way to attract more investment and foreign trade (Utusan Online, 2014). This situation will increase the economy of state and people around Tumpat.

1.2 Problem Statement

The fauna and flora of mangroves always threatened by the urbanization and industrialization although those in deceives give huge contribution to the socio-economics for local residents. Besides, excessive exploitation for the benefit of economy and development has disrupted the ecosystem of the mangrove forest. Conservation of mangrove forests is difficult to be taken without the cooperation by many agencies because it has no market price compared to economy aspect. Therefore, this study was conducted to determine the social demand at Delta Tumpat, Kelantan. Social demand preferred for conserve compare to develop the Delta Tumpat.

1.3 Research Objective

The objective of this study are :

1. To determine the social demand for conservation in Delta Tumpat, Kelantan.
2. To determine the social demand for development in Delta Tumpat, Kelantan.

1.4 Significant Study

This research is significant to determine the social demand for conservation and development in Delta Tumpat, Kelantan.

CHAPTER 2

LITERATURE REVIEW

2.1 Mangrove Area and Their Important

Mangroves are the only forests that located at the confluence of land and sea in the world's subtropics and tropics. Biomass of mangrove forests very related to rainfall, tides, waves and rivers (Daniel, 2002).

Delta Kelantan covered approximately 1,200 ha from 96915 ha in Peninsular Malaysia and it range area is from the estuary of the Kelantan Delta until the Seri Tujuh beach in Tumpat (Dony *et al.*, 2013).

Tumpat Delta only covers an area of 339.6 ha (Behara *et al.*, 2011). Previous study by Mohd (2008) estimated that the area was occupied nearly 354.1 ha in the year 2000. This shows that the mangrove area was decreasing around 14.5 ha in 6 years period (Behara *et al.*, 2011).

Mangrove forests are considered as one of the most productive ecosystems in the world and have a well-established ecological, economic and cultural importance (Dony *et al.*, 2013). Mangroves forests can truly be considered as evolutionary hotspots that suitable for terrestrial species have re-adapted to marine life, and marine species have undergone the transition to terrestrial species which consist of clash fresh water and sea water (Cannicci *et al.*, 2012).

Mangrove area also considered great ecological importance in shoreline stabilization, reduction of coastal erosion, nutrient retention, storm protection, flood, and water quality (Dahdouh-Guebas *et al.*, 2005).

In Tumpat, *Sonneratia caseolaris* and *Nypa frutican* can be found widely (Behara *et al.*, 2010). According to Behara (2011), *S. caseolaris* trees were death due to sand deposition over muddy substratum and also because of coastal erosion and uprooted. Mangroves are the border facing the South China Sea and are submitted to high-impact of waves and sand deposition will cause the death of several mature trees (Behara, 2011).

The mitigating effect of mangroves depends on two physical processes of tsunami namely wave attack and towing flow (Kathiresan, 2012). The mangroves have characteristics of density, height, species composition, density of forest, diameter of mangrove roots and trunks, and elevation of habitats have response to towing flow relies on “drag force”, resulting in prevention of coastal from erosion (Kathiresan, 2012).

2.2 Conservation and Policy

Mangrove forest is the habitat of rich biodiversity of flora and fauna. The major mangroves species are *Sonneratia caseolaris*, *Rhizophora mucronata*, and *Rhizophora apiculata*. The mangroves tree has become a sanctuary and breeding of small animals such as fish, crabs and bird. Besides the main mangroves plant, *Nypa fruticans* can be found widely along the Tumpat Delta in mangrove area (Behara *et al.*, 2010).

Ecotourism is one of the ways to conserve the mangrove area. Ecotourism is a sub-component of the field of sustainable tourism and contribute to the conservation of natural resources worldwide besides generate national income. For nature services, mangrove forest is a natural zone or a buffer zone (Patel *et al.*, 2014) to protect the coastline from the physical force of nature and protected from nature hazard.

Mangrove forest in Tumpat given artistic functions with a view and move the recreational or leisure activities and in 2000 until 2004, the Department of Forestry to implement a pilot project of conservation area and make it a program for sensitize and educate members of the public to appreciate its existence (Hapizah, 2009). A mangrove conservation building along with the jetty was built by the Forestry Department at Taman Tengku Mahkota in Tumpat and completed in 2008 with an allocation of RM1 million, act as the control center of mangroves and other species in the coastal Westport (Hapizah, 2009).

The mangrove area in Tumpat was decreasing around 14.5 ha in 6 years from 2000 until 2006 (Behara *et al.*, 2011). Loss of mangroves in Asia is a continuing problem, and awareness of their importance is on the rise encourage Asian countries

planting mangrove as protected against natural hazards especially after the tsunami. Mangrove forests will continue to be exploited, unless they are managed on a sustainable basis (Daniel, 2002). The initiative from governments (Astrid, 2012) and NGOs to conserve the mangrove area, indirectly give the motivation to the local resident to protect the coastal area (Rafael *et al.*, 2010) and do not only exploitation for resources.

Tsunami that occurred on 26th December 2004 has shown the importance of mangrove forests as a natural zone or a buffer zone to protect the coastline from the physical force of nature (Sachithanandam *et al.*, 2014). This has encouraged the various agencies have taken measures to conserve and protect the mangrove area such as gazetted as forest reserves or protected areas and planting mangrove trees in coastal area. However, conservation and preserve the mangrove forest without excessive exploitation activities are not easy because it has no market value compare to the economic sector in view of its favorable market value.

There are two categories of mangroves found in the various states in Peninsular Malaysia namely mangrove forest reserves and stateland mangrove forests (Sulong, 2016). Mangrove forest reserves are gazetted as permanent reserved forest (PFR) under the National Forestry Act and managed by Forestry Department for sustainable forestry production. State land mangrove forests on the East Coast, which are small and fragmented in size have not been fully studied are located around rivers and estuaries in the state of Pahang, Terengganu and Kelantan (Sulong, 2016).

The detail preliminary survey showed that more stateland mangrove forests are present in state of Kelantan especially along the Tumpat Delta and these stateland are

under the jurisdiction of State Government and not managed by the Forestry Department (Sulong, 2016).

National Forestry Policy 1978 (NFP) (revised 1992) has enshrined and mangrove also included and this policy provides guidelines and strong emphasis on the necessity for sound management, conservation, utilization, development and protection of the forests. The total area of mangrove forests in Peninsular Malaysia at the end of 2006 is estimated at 107802 ha, of which 82091 ha has been gazetted as Permanent Reserved Forests (PRFs) (Kamaruzaman, 2008). Proper mangrove forest management started in 1902. Mangrove Forests in Matang in 1904 is the first gazettelement of mangrove forest reserve and first working plan.

Conservation of mangrove forest as the ecotourism has given a significant role in the economy of the country possessing. For examples, Matang Mangrove Forest Reserve (MMFR) under concerted scientific management since the beginning of the 20th century and it still considered as the best managed mangrove forest in the world (Anisul *et al.*, 2015).

Awareness of the importance of the mangrove forest can reduce the impact of tsunami have made overseeing mangrove replanting projects following the tsunami. Important to preserve mangroves through education and involve the local community in the projects and must start from young generation in school (Lau, 2005).

Replanting the mangrove is one of the ways to conserve the mangrove area in Malaysia. Kelantan Forestry Department has started the planting activities at the edge of the beach area and 90% of mangrove plants were planted around Tanjung Dat Beach near Westport, covering an area of 27 km at a cost of about RM250000. The planted mangrove is important to break wave and erosion barrier on the

waterfront, maintaining habitat for many species of fish as well as developing a buffer zone (Abuhafizd, 2006).

2.3 Economy and Development Aspect

Economic valuation can be defined as the attempt to assign quantitative and monetary values to goods and services provided by ecosystem or natural resources, whether or not market prices are available (Mohd, 2014).

Commercial action is being increasingly adopted in developing nations due to strong pressure to increase living standards of people living in coastal areas (Daniel *et al.*, 2002) and mangrove area. Commercial exploitation was happen in larger scales due to demand from outside the local community and decreasing the forests can sustain.

Timber is also widely used to produce charcoal, furniture, poles for fish cages and traps, medicines, boats and many other products (Kathiresan *et al.*, 2001). The mangrove wood with high content of tannin is used as timber for its durability (Kathiresan, 2012). Rising demand for firewood and poles from the mining industries in the 1930 (Weng-Chuen *et al.*, 2002), make the demand for raw material increase and decreasing the forest area. Mangrove forest in Tumpat providing high quality wood charcoal and cymbals for construction (Hapizah, 2009) make the mangrove area decreasing.

Human activities in wetlands may cause alterations of wetlands and it affected ecosystem processes that are connected with each other (Abraham 2015). This is because mangrove provides a variety of ecological services and function as habitats for diverse flora and fauna (Tibor, 2014). If this area was disturbed, the possibility of

severe flooding during monsoon and extinction of species can occur. At the same time this will affect future tourism sector.

Besides, exploitation for short term benefits such as timber harvesting and marine resources without sustainable, the mangrove forest also give income or value if it was manage as recreational area (Ahmad, 2009). The mangrove forest of Larut Matang, Perak is the recreational area that famous with fishing activity and migratory birds from colder regions of China and Russia during month July to April (Ahmad, 2009). Benefits from the recreation is less because has no market price but the willingness to pay (WTP) is the one of the ways to collect income to conserver the protected area (Ahmad, 2009).

The increase resident in the mangrove forest have increased the demand for marine catches and also logging for port construction. This demand has led to mangrove forests become reduced and at the same time biodiversity in mangrove areas (Behara *et al.*, 2011) will also be affected due to human activity. This situation happen at West African and the Nigerian mangrove forest is the most threatened by fragmentation, isolation and surface drainage alteration that could be traced to indiscriminate logging, urbanization and recent oil and gas activities in the Niger Delta (Oyebade, 2010).

Social demand is different from the use of natural resources for daily life example catching marine life but more to demand for development mangrove area to more facilities and better life example port and residential housing. Human demand is to make clear of mangrove area for fish pond and residential housing given effect to the water quality because mangrove forest is buffer zone (Bradley, 2004).

The loss of mangroves forest for aquaculture is one of the largest threats to mangrove forests worldwide. Cultivation of grouper and sea bass in floating cages offers an inherently less destructive form of fisheries exploitation but impact depends upon proper planning and management (Daniel *et al.*, 2002) is not easy to manage. The aquaculture has given impact to the water quality and ecosystem is still noticeable (Saremi *et al.*, 2012).

The disturbance in the mangroves will disrupt the growth and natural succession of mangrove forests. Predict that losses of crabs as a result of pollution will affect the mangrove forest because it retain litter and recycle nutrients within forest soils, bioturbated the forest floor to stimulate microbial decomposition prey on propagules to influence the distribution, abundance and succession of tree species (Smith *et al.*, 1991).

Mangroves ecosystems are important for the maintenance of the local coastal fishery industry in Malaysia for harvested include many shrimp species, edible mud crab (*Scylla serrata*) and gastropods (*Cerithidea spp.*) are common in the mangroves while cockles (*Anadara granosa*) are abundant in mud flats (Abdul *et al.*, 2004). These harvested provide an important commercial food source and local economy.

Detritus and nutrients exported out of the ecosystem form the food base for marine micro-organisms and support the valuable estuarine and near shore fisheries (Abdul, 2004). Mangrove environment important in spawning and nursery ground for many marine shrimps and fishes that will contribute for fisheries (Abdul, 2004).

CHAPTER 3

MATERIALS AND METHODS

3.1 Study Area

The study was conducted at Delta Tumpat, Kelantan. The delta is located between latitudes of 06° 11N and 06° 13N and longitude of 102° 10E and 102° 14E with the total area is approximately 339.6 ha (Behara *et al.*, 2011).

The total area of the Tumpat District is 2372.5 ha and the population is 147179 people (Majlis Daerah Tumpat, 2016). This survey was conducted among the local people at Tumpat where focus to the people at Kok Majid (Sungai Pinang), Bandar Tumpat, Sri Tujoh, and Telok Renjuna area as shown in Figure 3.1. The total population of these four study area are 16677 according to population statistics 2010.

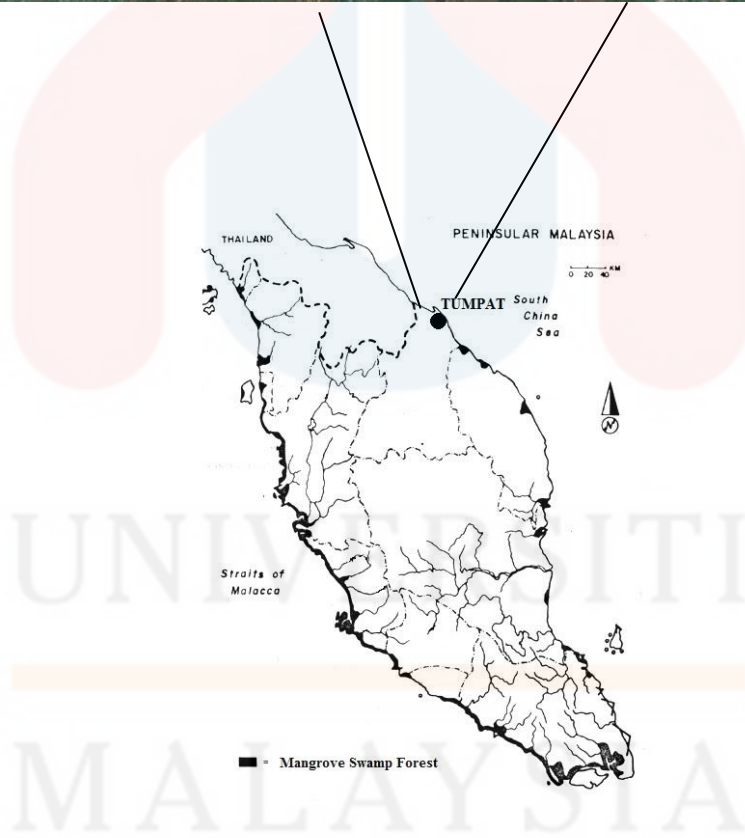


Figure 3.1: Study area in Tumpat, Kelantan.

3.2 Method

The local people in the study areas were chosen randomly and the targeted population was 120 respondents from local residents.

This study used questionnaires to obtain respondent information and perspective concerning social demand of mangrove area for conservation or development areas. The questions were focus on social demand for conservation and development area in Delta Tumpat, Kelantan. The survey using questionnaire have been proven effective by Ahmad, 2009 in survey recreational values of mangrove forest in Larut Matang, Perak

120 sets of questionnaires were distributed to the local people at Tumpat where focus to the people at Kok Majid, Bandar Tumpat, Sri Tujoh and Telok Renjuna. The questionnaire discovered about social demand for conservation and development areas in Tumpat Delta.

The questionnaire was divided into three parts. Part one is contained questions related to demographic backgrounds or demographic characteristics such as gender, education and other). Part two is related to the awareness about mangrove forest in Delta Tumpat. In this part, the question majorly concern on the importance and benefits of mangrove area in Delta Tumpat. The final part is about the conservation and development demand.

Before the questionnaires were distributed, the pilot study was conducted for 22 sets of sample to test the reliability and acceptability of the questionnaires.



Figure 3.2: Questionnaire session

3.3 Data Analysis

A Likert scale was used in this study to determine the social demand by scale “Strongly disagree (1), Disagree (2), Not sure (3), Agree (4), Strongly agree (5)”. A Likert scale is an ordered scale from which respondents choose one option that best aligns with their view. It is often used to measure respondents’ attitudes by asking the extent to which they agree or disagree with a particular question or statement.

The collected data from questionnaires were analysis by using Statistical Package for the Social Sciences (SPSS) software version 20.1 and Microsoft Office Excel 2010.

The result for the pilot study to test the reliability and acceptability of the questionnaire was 0.846 (refer table B1) and it was greater than 0.7. The value greater than 0.7 is the value acceptable for the questionnaire set.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

The demographic data includes gender, race, age, education and occupation of the respondents.

The total of 120 respondents had answered this survey. There were 79 males and 41 females with 118 Malay, one Indian and one Chinese respondent. 37% of the respondents were from the age group 31 to 40 while 30% were from the age group 41 to 50.

35% of the respondents were from SPM/STPM education level, 28% were from PMR/ PT3 and 28% were from Diploma/Degree/ Phd.

4.2 The Level of Awareness about Mangrove Area.

This part is to know the level of respondent awareness about the function of mangrove areas to the environment.

4.2.1 Aware about Existence of Mangrove Area.

Figure 4.1 showed that 72% of the respondents were aware about existence of mangroves in Tumpat and the remaining 28% does not aware about existence of mangroves in Tumpat. There are a few of respondents were totally do not recognize the mangrove tree.

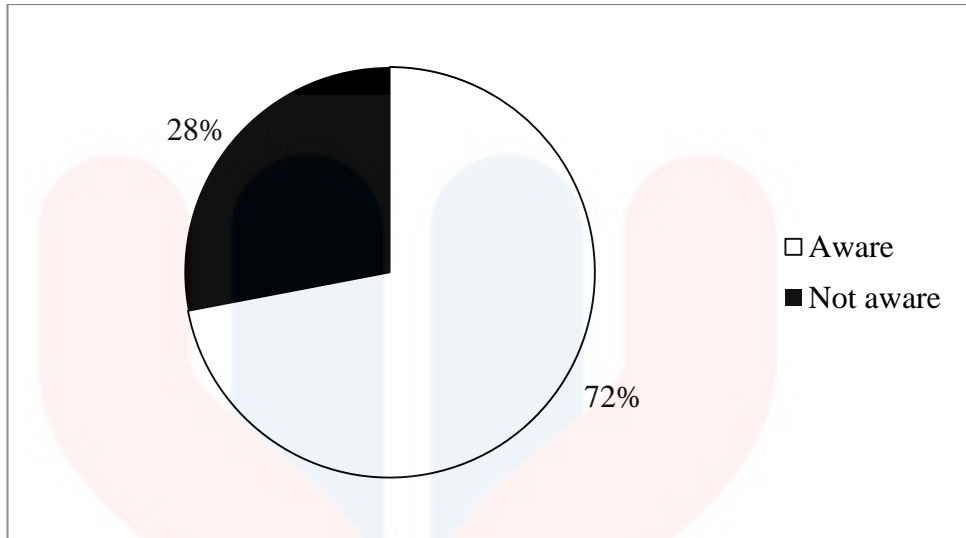


Figure 4.1: Percentage of respondents who aware about existence of mangrove area in Tumpat

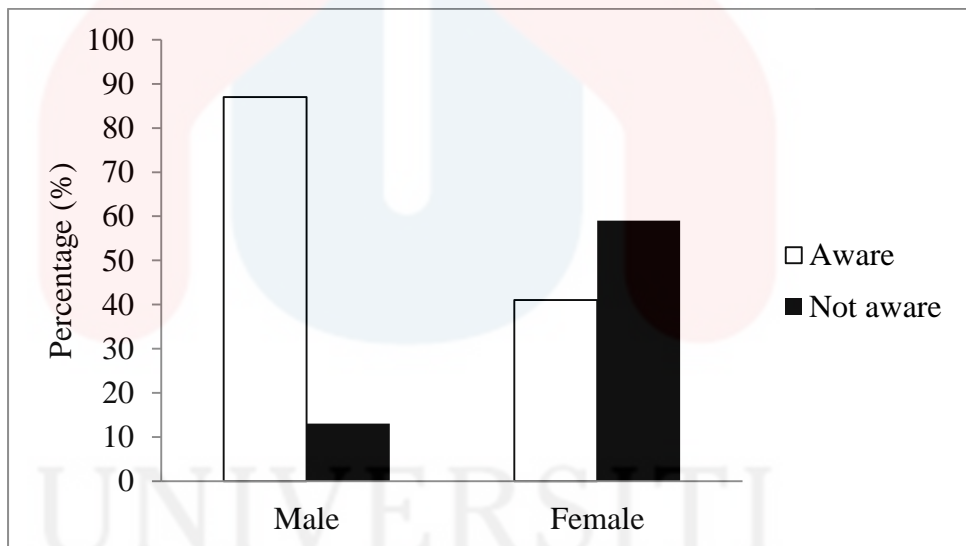


Figure 4.2: Graph respondent's gender against the percentage of respondents who aware about existence of mangrove area in Tumpat.

From this survey, it showed that 87% of male respondents are aware know of existence of mangrove area in Tumpat. Where, only 41% of the female respondents know about the mangrove area. The percentage of the female respondents who does not know about existence of mangrove in Tumpat was higher, 59% compared to respondents who know about it, 41%.

4.2.2 Importance of Mangroves to the Environment.

Mangrove is important in term of income for the local people such as fishery, recreation area and timber. Besides, it also important for protected coastal area from erosion and flood. Figure 4.3 showed that 59% respondents were known about the importance of mangroves to the environment while the rest is not.

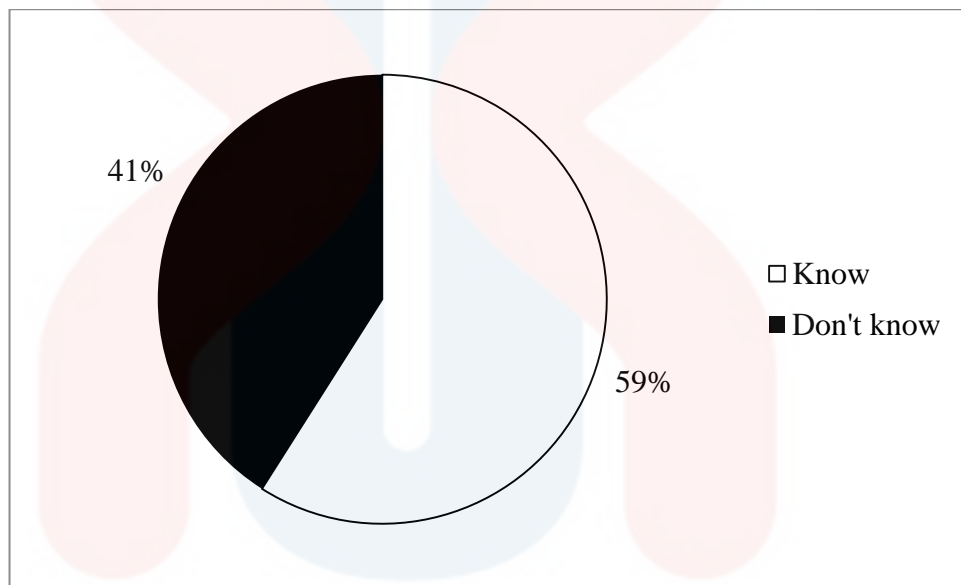


Figure 4.3: Percentage of respondents who know about importance of mangrove to the environment

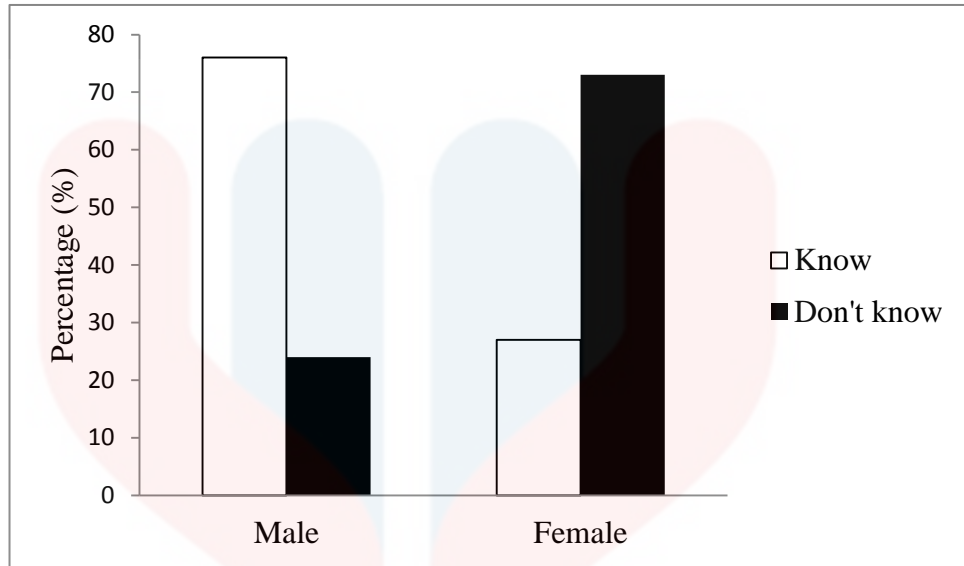


Figure 4.4: Graph respondent's gender against the percentage of respondents who know about importance of mangrove to the environment.

From Figure 4.4, 76% of male respondents know about importance of mangrove to the environment compared female respondents, 27%. 73% of the female respondents who does not know about importance of mangrove to the environment were higher compared 27 % who know about it.

4.3 Social Demand

4.3.1 Types of Conservation Demand

Table 4.1: Types of conservation demand

Types	Percentages agree (%)
Penalty imposed	95
Community activity	90
Planting mangrove trees	76
Reduce logging activity	76
Limited the exploitation	51

Majority of the respondents (95%) agree to penalize imposed on individual that throw rubbish or make damage the facilities that have provided in the Tumpat coastal area. The percentage for limited the exploitation of the sea and forest products is the least compared to other because majority of the respondents economy totally dependent on natural resources such as pick up *Nypa frutican* leaves, catch mollusca species and fishing.

The respondents agree that mangrove area in Delta Tumpat is important for environmental stability, prevent erosion and flood, and breeding area for marine life. Mangrove trees have plays the important role in environment and economy local community.

4.3.2 Types of Development Demand.

Table 4.2: Types of development demand

Development activities	Percentages agree (%)
Broadband system (internet)	94
Road enlarge	91
Increase boats for tourists	87
Increase homestay	84
Port construction	83
Drainage system and water flow	80
Housing structured	38
Fishing boats renovate	33

94% of the respondents agree to improve the broadband system /internet and 91% was agreed to enlarge the road for the convenience of residents. While majority respondents do not agree for housing should be structured in a more strategic and systematic which is 62% and 67% of respondents does not agree to renovate the fishing boats. This is because most of houses were built in private land and it was very difficult to structure and take a lot of work. Respondents also do not agree to renovate the fishing boat because it required large capital.

Respondents also demand for other development for easily the daily life and increase the economy such as demand for drainage system and water flow, 80% and increase the number of homestay for tourist in addition it will

increase the income for the passenger boat owners, restaurant on the island and seller.

4.3.3 Social Demand for Conservation and Development Areas

Table 4.3: Social demand for conservation and development areas in Delta Tumpat

Preference	Percentage (%)
Conservation and development	52
Conservation only	37
Development only	9
Neither to conservation/development	2

Table 4.3 showed the percentage of social demand for conservation and development areas in Delta Tumpat, Kelantan. There are 37% of respondents that are totally agree to conserve and 9% of respondents totally agree to develop Delta Tumpat while 52% of the respondents chose both to conserve and develop it. It means majority of the respondents chose to conserve the Delta Tumpat because this Delta plays an important role for environment and economy for the local community.

Besides conserve the Delta Tumpat, respondents also want the development to increase the income and daily activities but the developments that want to construct must does not give harm and negative effect toward environment.

Respondents agree to develop Delta Tumpat by improve the broadband system /internet, 94% especially for Telok Renjuna. In Telok Renjuna there are two islands that have more develop compared to other

island namely Pulau Beluru and Pulau Suri. Sekolah Kebangsaan Pulau Beluru located at Pulau Beluru has become one of the choose school for the local residents and there also have clinic for the convenience of residents.

The teachers and students, who live at Tumpat mainland, they need to ride the boat every day to school. Increasing the number of boat was needed for easily of daily activities. Besides, Pulau Suri has become one of the tourist's attractions when it became the first floating bazaar in Kelantan. Development also needed to other island in Delta Tumpat to increase the local residents economy.

However, the geographical condition of Delta Tumpat is also one of the barriers to develop it. For example, the construction of port cannot be constructed because the coastal area is too shallow and fisherman also has to face this difficult when the marine estuary is to tide.

Thus, the respondents preferred to conserve the Delta Tumpat compared to develop it although at the same time they also wants development. This is because they think environmental stability is important and mangrove areas need to preserve for future generation benefit. Besides, density of extreme development would disrupt the daily life of the local community and finally will give negative feedback to the local community and also to environment.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Development is often a guideline for advancement and standards living of the local population, yet environmental is always become a victim. Residents of Delta Tumpat were required more development to convenience the daily life but they more preferred and want to maintain Delta Tumpat and mangrove areas for environmental stability. The development would be carried out to protect and sustainable toward environment.

37% of respondents agreed to conserve the delta meanwhile, 52% of respondents chose both conserve and develop the delta area. Mangrove area is important for the environment especially for nature protected from hazard. Majority of the respondents were aware about the existing of the mangrove area in Tumpat, 72% and 59% of the respondents know about it function/importance to the environment.

5.2 Recommendation

The programme to introduce mangroves to the local residents should be done because mostly of them except fishermen and the person who have connected to the mangrove, they did not recognize mangrove trees and totally do not know about the importance of mangrove area towards environment. Through this program they will be able to gain knowledge and have awareness about the mangrove area. School students should also be exposed to the mangroves and their importance to the

environment thus can nurture a love for the natural beauty and cooperate in maintaining the beauty this delta.

The total questionnaires were set only 120 sets because the total of questionnaire sets based on Krejcie & Morgan, 1970 was large, 375 sets. The total population at study areas were 16677 (Majlis Daerah Tumpat, 2010) and it give large number of sets questionnaires. So that, further study should be done to know more detail about social demand for conservation and development in Delta Tumpat.

Besides, the quality of the questionnaires needs to be improved to get more detail about the social demand in Delta Tumpat. The question must relevant and have strongly related to the respondents so that the study will be done successfully. Future study also need to divide the total questionnaire equally amount for each categories so that the difference opinion between the categories is known.

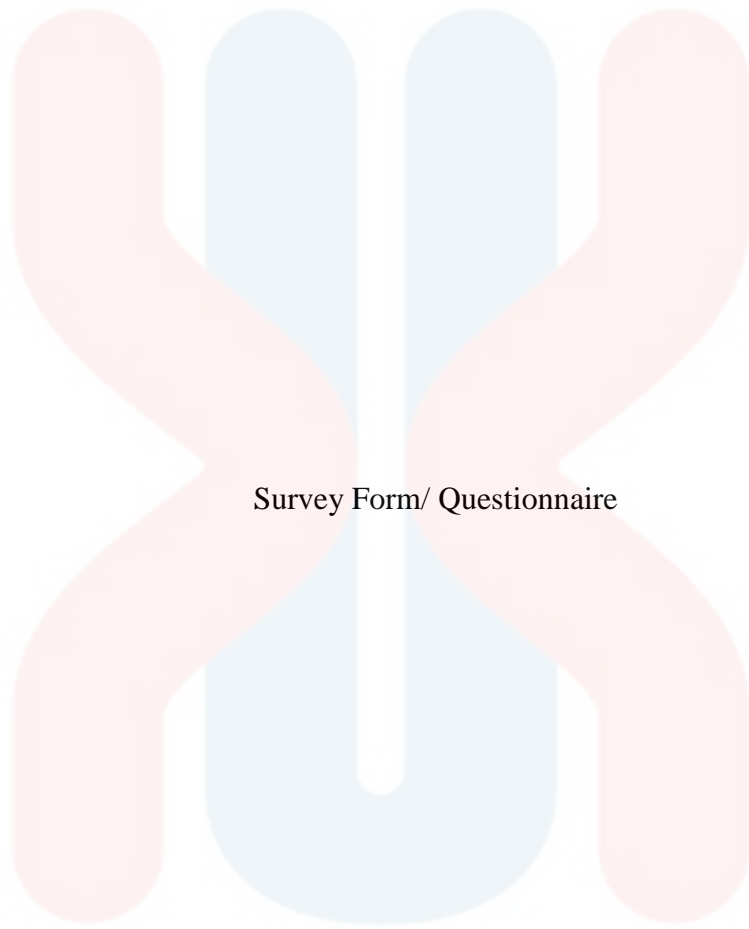
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APPENDIX A



Survey Form/ Questionnaire

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Penilaian Permintaan Sosial untuk Pemuliharaan dan Pembangunan Kawasan di Delta Tumpat, Kelantan.

*(Assessment of Social Demand for Conservation and Development Areas in Tumpat
Delta, Kelantan.)*

Borang soal selidik

Soalan-soalan berikut adalah berkaitan dengan menentukan permintaan sosial untuk pemuliharaan dan pembangunan di Delta Tumpat. Saya akan meminta beberapa minit masa anda untuk mengisi borang penyiasatan ini. Jawapan anda hanya akan digunakan untuk tujuan kajian ini dan akan dirahsiakan. Maklumat penyelidikan digunakan sebagai sebahagian daripada Projek Tahun Akhir (FYP). Terima kasih.

Questionnaire

The following questions are related to the social demand for conservation and development in Delta Tumpat. I will ask a few minutes of your time to fill out this survey. Your answers will only be used for the purposes of the Final Year Project (FYP) and will be kept confidential. Thank you.

Bahagian A : Latarbelakang responden/ Respondents background.

Sila tandakan (✓) pada kotak yang disediakan. *Please tick (✓) to the box provided.*

1. Jantina/*Gender*:
 Lelaki/ *Male* Perempuan/ *Female*
2. Keturunan/ *Race*:
 Melayu/ *Malay* Cina/ *Chinese*
 India/ *Indian* Lain-lain/ *Other*:
3. Peringkat umur/ *Age group*:
 ≤ 20 51 - 60
 21 - 30 61 - 70
 31 - 40 ≥ 71
 41 - 50
4. Latar belakang pendidikan/ *Education*:
 Tiada/ *None* SPM/ STPM
 UPSR Diploma/Degree/ Phd
 PMR/PT3 Lain- lain/ *Other* :
5. Pekerjaan/ *Occupation*:
 Swasta/ *Private*
 Kerajaan/ *Government*
 Bekerja Sendiri/ *Self-employed*
 Pelajar/ *Student*
 Tidak bekerja/ *Unemployed*

Tandakan (√) pada jawapan yang sesuai pada bahagian C dan D.

Tick (√) to the appropriate answer for sections B, C and D.

Bahagian B: Tahap kesedaran tentang pokok paya bakau.

Part B: The level of awareness about mangrove trees.

Bil	Perkara/Item	(Yes)	(No)
i	Adakah anda sedar tentang kewujudan paya bakau di Tumpat? <i>Are you aware about existence of mangroves in Tumpat?</i>		
ii	Adakah anda mengetahui tentang kepentingan hutan paya bakau kepada alam sekitar? <i>Do you know about the importance of mangroves to the environment?</i>		



Skor/ score	(1) Sangat tidak setuju/ <i>Strongly disagree</i>	(2) Tidak setuju/ <i>Disagree</i>	(3) Tidak pasti/ <i>Not sure</i>	(4) Setuju/ <i>Agree</i>	(5) Sangat setuju/ <i>Strongly agree</i>
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Bahagian C : Permintaan sosial untuk pembangunan di kawasan hutan paya bakau di Tumpat.

Part C: Social demand for the development in the area of mangrove forests in Tumpat.

Bil	Perkara/ Item	(1)	(2)	(3)	(4)	(5)
i.	Adakah anda bersetuju sekiranya kawasan persisiran pantai Tumpat akan dibina perlabuhan untuk tujuan perikanan? <i>Do you agree if the coastal areas in Tumpat will be constructed a port for fishery purposes?</i>					
ii.	Pasar basah dan kemudahan lain di Tumpat perlu diperbesarkan untuk kegunaan orang awam. <i>Wet market and other facilities need to be enlarged in Tumpat for public uses.</i>					
iii.	Kilang memproses ikan yang sedia ada tidak mencukupi. <i>Existing fish processing factory is insufficient.</i>					
iv.	Jalan raya perlu dibesarkan/ dibaik pulih di kawasan Tumpat untuk kemudahan ramai. <i>The road should be enlarged / repaired in Tumpat area for public convenience.</i>					
v.	Bilangan rumah tumpangan perlu diperbanyakkan untuk menarik lebih ramai pelancong. <i>The number of homestay / guest house should be increased to attract more tourists.</i>					
vi.	Bilangan bot perlu diperbanyakkan dan mempunyai ciri-ciri keselamatan untuk meningkatkan bilangan pelancong. <i>The number of boats needs to be increased and have safety features to increase the number of tourists.</i>					
vii.	Sistem perparitan dan aliran air perlu dipertingkatkan untuk memudahkan kegiatan harian penduduk. <i>Drainage system and water flow should be enhanced to facilitate the daily activities of the population.</i>					
viii.	Sistem jalur lebar (internet) perlu dipertingkatkan di kawasan Tumpat untuk kemudahan komunikasi.					

	<i>Broadband system (internet) should be enhanced in the Tumpat area for ease of communication.</i>					
ix.	Perumahan perlu distrukturkan dengan lebih strategik dan sistematik. <i>Housing should be structured in a more strategic and systematic.</i>					
x.	Bot nelayan perlu diubah suai dan dibaik pulih untuk meningkatkan hasil tangkapan. <i>Fishing boats need to renovated and refurbished to improve the catch.</i>					
xi.	Pembangunan di kawasan paya bakau Tumpat membantu meningkatkan ekonomi penduduk. <i>Development in Tumpat mangrove swamps helps improve the economy of the people.</i>					
xii.	Saya lebih suka kawasan Tumpat dibangunkan berbanding dipelihara. <i>I prefer the Tumpat area was developed compared than preserved.</i>					



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Bahagian D: Permintaan untuk pemuliharaan kawasan hutan paya bakau di Tumpat.

Part D: Social demand for conservation of mangrove forests in Tumpat.

Bil	Perkara/ Item	(1)	(2)	(3)	(4)	(5)
i	Ekosistem hutan paya bakau penting untuk menjaga kestabilkan alam sekitar. <i>Mangrove ecosystem is important to maintain environmental stability.</i>					
ii	Aktiviti penanaman pokok bakau adalah perlu untuk memelihara kehijauan Tumpat. <i>Activity planting of mangrove trees is necessary to preserve the greenness of Tumpat.</i>					
iii	Tanaman spesies bakau penting untuk menghalang hakisan kawasan pantai dan mencegah banjir besar. <i>Mangrove species is important to prevent erosion of coastal areas and prevent flood.</i>					
iv	Pemeliharaan dan pemuliharaan hutan paya bakau boleh meningkatkan bilangan pelancong di Tumpat. <i>Preservation and conservation of mangrove forests can increase the number of tourists in Tumpat.</i>					
v	Aktiviti pembalakan di kawasan paya bakau perlu dikurangkan bagi menjaga ekosistem hutan. <i>Logging activity at mangrove areas must be reduced to maintain forest ecosystems.</i>					
vi	Aktiviti pemuliharaan kawasan persisiran pantai Tumpat perlu diperbanyakkan untuk kesejahteraan masyarakat. <i>Conservation activities in Tumpat coastal area should be increased for community welfare.</i>					
vii	Denda akan dikenakan kepada individu yang membuang sampah atau merosakkan kemudahan yang disediakan di kawasan pantai Tumpat. <i>Penalty will be imposed on individuals who throw rubbish or damage the facilities that have been provided in the Tumpat coastal areas.</i>					
viii	Aktiviti kemasyarakatan seperti gotong-royong perlu dijalankan untuk menjamin kecantikan kawasan paya bakau. <i>Community activities such as gotong-royong should be carried out to ensure the nature beauty of mangrove swamps.</i>					
ix	Eksplotasi hasil laut dan hasil hutan perlu dihadkan bagi mengelakkan kekurangan sumber di masa hadapan.					

	<i>Exploitation of the sea and forest products should be limited in order to avoid a lack of resources in the future.</i>					
x	Kawasan paya bakau penting untuk pembiakan hidupan laut untuk pendapatan nelayan. <i>Mangrove areas are important for breeding of marine life to the income of fishermen.</i>					
xi	Hutan paya bakau perlu dijaga supaya generasi akan datang dapat mengenali dan mengetahui kepentingannya kepada alam sekitar. <i>Mangrove forests should be preserved so that future generations are able to recognize and knows the importance of mangrove trees to the environment.</i>					
xii	Saya lebih suka kawasan paya bakau di Tumpat dipelihara berbanding dibangunkan. <i>I prefer the mangrove swamp in Tumpat are preserved than developed.</i>					



End of the question.

Thank You.

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APPENDIX B

Pilot Study

Table B1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.733	.846	31