Article:
Barau, AS and Stringer, LC (2015) Access to and allocation of ecosystem services in Malaysia's Pulau Kukup Ramsar Site. Ecosystem Services, 16. pp. 167-173. ISSN 2212-0416

https://doi.org/10.1016/j.ecoser.2015.10.021

Access to and Allocation of Ecosystem Services in Malaysia's Pulau Kukup Ramsar Site

Aliyu Salisu Barau
Department of Urban and Regional Planning,
Faculty of Earth and Environmental Science,
Bayero University Kano, Nigeria
aliyubarau1@yahoo.co.uk

Lindsay C. Stringer
Sustainability Research Institute
School of Earth and Environment
University of Leeds
Woodhouse Lane, Leeds, LS2 9JT, UK
l.stringer@leeds.ac.uk

Abstract

This paper explores how the Ramsar Convention, a key multilateral environmental agreement for the world's wetlands, influences the allocation and use of ecosystem goods and services. Focusing on the world's second largest uninhabited mangrove island, Pulau Kukup, this study illustrates the social and ecological risks and opportunities surrounding protected wetlands. Interviews with, and observations of, nearby communities reveal that Pulau Kukup has continued to render regulatory, cultural, provisioning and supporting ecosystem services under different governance regimes and institutional arrangements. Under the current governance regime, national conservation agencies focus largely on conservation and have struggled to implement the principles of wise use as specified by the Ramsar Convention. Nevertheless, such strict local (formal) conservation rules restricting public access have improved the ecological integrity of the mangrove island, with little negative impact on the locals. While restrictions in access may be seen as a trade-off for local communities wishing to pursue cultural activities, tourism linked to the island's Ramsar designation has boosted the local economy. Despite these benefits, changes in property rights and growing influxes of tourists visiting the protected wetland may affect the long-term ecological integrity and the balance between wetlands, communities, livelihood options, and sustainability. Such challenges demand governance that recognises and responds to these emerging issues.

Keywords: Wetlands, local community, resource regimes, intergovernmental, trade-offs

1. Introduction

Resource governance (including the governance of ecosystem services) encompasses a range of different approaches, both at and across different levels. Governance can include centralised and decentralised policy-making, non-hierarchical decision-making, involvement of public and private actors, and engagement of formal and informal rules (Biermann, 2012; 2013; Jax et al. 2013; Paavola

and Hubacek 2013; Schroeder, 2014). Resource governance institutions in any given society interact to determine patterns of access to and allocation of ecosystem services (Gómez-Baggethun et al. 2013). Recognition of the importance of access and allocation of resources and opportunities increased when it became one of five research themes of the Earth System Governance Project – the world's largest social science research network on governance and environmental change (Biermann et al. 2009; Biermann et al. 2010). Coupled with this, increasing pressure on vulnerable natural resources and the need to ensure social and environmental justice (Guzman Ruíz et al. 2011; Benerjee, 2013; Kantor, 2013) have resulted in greater policy focus on access and allocation of ecosystem services.

In resource governance, the interactions of multiple institutions, operating at and across different scales and levels, complicate patterns of access and allocation of ecosystem services for some types of ecosystems. Such governance complexity can be seen in wetland areas designated as Ramsar sites. Under the influence of traditional institutions, local communities had historical stewardship of wetlands, long before recent interventions by sub-national, national and international conservation institutions. Some scholars consider that in the current era of governance complexity, challenges of scale, science–policy gaps, weak scientific foundation and lack of rigour in evaluation have considerably weakened the effectiveness of (formal) ecosystem service governance mechanisms (Higgins et al. 2014; Guerry et al. 2015; Naeem et al. 2015). It therefore becomes essential to redefine and co-construct knowledge on access and allocation of ecosystem services if these challenges are to be addressed (Fletcher et al. 2011; Diaz et al. 2015) and if wetland governance is to be sufficiently responsive to emerging sustainability challenges.

Many protected wetlands are exposed to environmental hazards that threaten their ecological functioning and the quality of the ecosystem services they provide for communities. Recent studies have revealed that water quality degradation arising from urban and industrial uses is threatening livelihoods and ecosystems around Malaysia's Pulau Kukup Ramsar site (Jaafar et al. 2014; Lim et al. 2014). Similarly, pollution from aquaculture has threatened livelihoods dependent upon ecosystem services from Vietnam's mangrove systems (Orchard et al., in press 2015). The vulnerability of Ramsar sites to stressors such as rapid coastal urbanisation and climate change, and the implications of that for community access to ecosystem services have received little research attention. Similarly, researchers and policymakers understand little about the (direct and indirect) implications of Ramsar site designation for neighbouring communities.

It is imperative to understand both the negative and positive sides of community-Ramsar site interactions in order to gain more insights into ecosystem services governance, particularly with regard to questions of resource access and allocation. Against this backdrop, the research questions driving this study ask: how does designation of a wetland as a Ramsar site undermine communities' access to ecosystem services? How do communities exploit the benefits of labelling wetlands as Ramsar sites/conservation areas, and what are the socio-ecological benefits and threats this creates? Focusing on Malaysia's Pulau Kukup, this study contributes to the existing ecosystem services

78 governance literature by presenting a more nuanced understanding of wetland governance in the
79 context of the interests and aspirations of local communities.

80 **2. Governance of wetland ecosystem services**

81 Many scholars perceive ecosystem services governance as a loose and weak concept owing to
82 complexities in institutions, actors, and fragmentation of policy frameworks (Joshi, 2012; Kalfagianni
83 and Pattberg, 2013). Nonetheless, the need for governance of ecosystem services in wetlands
84 requires these ecosystems to be clearly defined. According to the Ramsar Convention (1971),
85 wetlands are "areas of marsh, fen, peatland or water whether natural or artificial, permanent or
86 seasonal with water that is static or flowing, fresh, brackish or salty, including areas of marine water
87 the depth of which at low tide does not exceed six metres." What is unique about wetlands is that
88 they are saturated, inundated, for an extended period, have unique soils and vegetation, and their
89 distinctive terrestrial, hydrological and climatic conditions support unique biodiversity (Aber et al.
90 2012). Compared to other ecosystems, wetlands provide the highest and most diverse range of
91 ecosystem services (Barbier, 2011; ten Brink et al. 2013). Just over a decade ago, the global
92 estimation of annual wetland ecosystem service monetary values placed Asian wetlands the highest,
93 with a value of US$ 1,818,534 billion out of the global total of US$3,444,682 (Schuyt and Brander,
94 2004). The unique and immense socio-ecological functions of wetlands create a need for innovative
95 policy and governance systems capable of responding to the challenges these systems face.

96 Currently, there are over 700 sites that the intergovernmental Ramsar convention designates as
97 wetlands for conservation and wise use by citizens (Ramsar Convention, 2008; Griffin, 2012). In
98 principle, implementation of Ramsar Convention falls under the responsibility of governments
99 through their conservation agencies. Therefore, the extent to which ecosystem services are allocated
100 to people is defined by the decisions of conservation authorities. However, ambiguities in strategies
101 and approaches for implementing the Ramsar Convention, particularly in respect of conservation
102 versus wise use, have remained critical challenges for communities' abilities to access ecosystem
103 goods and services (Fletcher et al. 2011; Horowitz, 2013). Indeed, the experience of some places has
104 shown that the transformation of institutions governing resource regimes dictates communities'
105 opportunities for accessing ecosystem services (Gómez-Baggethun et al. 2013).

106 Unravelling the history of resource regimes operating in wetlands is essential for understanding and
107 analysing the dynamics of access to and allocation of ecosystem services. Historical analyses of many
108 south Asian and Australian societies have revealed the role played by customary laws in establishing
109 intergenerational wise use and private ownership of wetlands designated as Ramsar sites (Farrier and
110 Tucker, 2000; Moore et al. 2013). However, today's multiplicity of stakeholders and institutions
111 governing wetlands resource regimes remain fragmented (Kalfagianni and Pattberg, 2013), despite
112 that their interactions lead to specific outcomes for communities. As such, it is critical to shift
113 attention towards understanding how people living around protected ecosystems and Ramsar sites
114 are affected by, and respond to, the different governance regimes that shape their access to and
115 allocation of ecosystem services.

2.1 Governance of wetland ecosystem services in Malaysia

As a humid tropical country, Malaysia has an abundance of wetlands whose biodiversity and ecosystem services potentials are ranked among the most valuable in the world (Schuyt and Brander, 2004). It is important to stress that wetlands, and mangrove forests in particular, are critical to the survival of the Malaysian fishing industry and other sources of local livelihood. According to Yahaya (2003), the richest commercial fishing grounds in Malaysia are found very close to mangroves. These mangrove forests are important sources of wood-fuel for charcoal production, poles and building materials for local communities living in their fringes (Juliana et al. 2014; Lantiff and Farida-Hanum, 2014).

Malaysia's integrated wetland governance is spelled out under the National Wetlands Policy of 2004, which according to Ministry of Natural Resources and Environment (2014) aims to fulfil Malaysia's obligations under the Ramsar Convention and Convention on Biological Diversity (CBD). The four objectives of this policy are as follows: 1) protection and conservation of different types of wetlands; 2) integration of wetland conservation interests into overall natural resource planning; 3) increase scientific and technical knowledge 4) increase public appreciation of wetland functions or benefits and the restoration of degraded wetlands. These objectives tend to emphasise conservation and protection of ecosystems and do not explicitly recognise public rights to access wetland areas. This situation also extends to sub-national level where, for instance, Maniam and Singravelloo (2015) observed disconnections between conservation projects, policies, and local communities in the southern Malaysia's Johor State. Researchers also tend to pay attention to the potentials of wetlands to the formal economy, in lieu of the local economy, around Ramsar sites (Aminu et al. 2014).

3 Methods and study area

This study depended largely on primary data acquired through fieldwork, as well as detailed literature review. The purpose of the fieldwork was to understand and analyse how the designation of Pulau Kukup as a Ramsar site has affected communities' access to ecosystem services. Data collection used group interviews and direct observations of people's interactions with resources, including observation of socio-economic and ecological opportunities. The approach followed scholarly views on the need to redirect ecological sciences towards policy-based responses and solving societally relevant problems (Barot et al. 2015; Courchamp et al. 2015), identifying from the bottom up, the who, what and how of ecosystem service access and allocation (Naeem et al. 2015). Fieldwork was conducted during weekends in April 2013. The weekends are the peak periods for tourists' arrival in the town and also peak periods for social activities and businesses. Choice of this time aimed to maximise observations of people's interactions with this environment. Field observations and interviews were conducted at three locations: Pulau Kukup Ramsar site, Kukup fishing village, and *kelong* sites (floating fish farms) located on the water that separates the Ramsar site and Kukup village.

Some studies use semi-structured group interviews to scrutinise respondents' direct experiences of community access to ecosystem services (Gómez-Baggethun et al. 2013). In framing the interview questions set for this study, note was taken of the experiences of Iarossi (2006), who suggested that respondents from countries including Malaysia dislike lengthy interview questions. Hence, short questions focused on ecosystem services, livelihoods, and land tenure as critical issues that underpin the principle of wise use of wetlands (Ramsar Convention, 1971) and fair and equitable use, as specified by CBD Article 1 (CBD, 2006). Questions asked included: what are the benefits of Pulau Kukup for this community? Does restriction in accessing Pulau Kukup worry the community? What role does land tenure security play in changing this community? What are the most important livelihood options for this community? How does tourism industry benefit people? Do you consider the use of tidal wave waste cleaning appropriate?

In framing the study questions and observations, the principles of knowledge co-design and co-production in landscape studies were considered (Ayre and Nettle, 2015). As such, the field assistance of a Malaysian Chinese university Associate Professor who had worked in the study area for more than twenty years was sought. She played an important role in simplifying the terms and concepts used for the interviews into a common language that she interpreted into the languages spoken by the respondents (Malay and Chinese). Based on the study research questions, we focussed on waste disposal, flood control, provisioning services (underpinning fishing/*kelong* businesses, ecotourism, local businesses), cultural history and the functions of Pulau Kukup. Participants in the first three interviews were drawn using snowball sampling. The research assistant contacted a respected businesswoman who identified other participants she believed had sufficient knowledge, stake and community experience.

Table 1 summarises the group interview sample. The first group interview was conducted at a home-stay (tourist accommodation) on a Saturday during the dinner time. This involved four participants (coded 1A-4A). The second interview with three fishermen/*kelong* operators (coded 5B-7B) was held on a Sunday afternoon at one of the *kelong* sites directly located between Kukup village and the Kukup Ramsar site. The third group interview with two staff of Johor Park (coded 8C-9C) was held at Pulau Kukup Ramsar site office reception on a Sunday. The fourth group interview was held inside the Sea Dragon Temple at Kukup fishing village. The three participants for the Sea Dragon Temple interview (coded 10D-12D) were sampled through convenience sampling method. The author and field assistant jointly selected the site because it is located away from the coastline and provides the chance of meeting other community members who belong to other occupational groups. In every interview, each participant was given a chance to respond to all the questions. Responses were noted down following interpretation by the field assistant. The field assistant advised against using recording devices because the respondents might not like their responses to be recorded electronically. Some respondents skipped some questions or simply agreed with the views expressed by their co-interviewees.

Table 1: Profile of the 12 interviewees held at Pulau Kukup and surroundings

Respondents	Gender	Age	Ethnicity	Length of Stay	Major occupation
1A	Female	>60	Chinese	>30 years	Homestay owner
2A	Female	57	Chinese	>20 years	Homestay owner
3A	Male	49	Chinese	>15 years	Homestay caretaker
4A	Female	51	Chinese	>10 years	Homestay caretaker
5B	Male	24	Chinese	6	Fish farmer
6B	Male	28	Chinese	10	Fish farmer
7B	Male	43	Chinese	35	Fish farmer
8C	Female	29	Malay*	1	Conservation officer
9C	Male	33	Malay*	2	Conservation officer
10D	Male	32	Chinese	8 years	Seafood seller
11D	Male	35	Chinese	5 years	Grocery shopkeeper
12D	Male	39	Chinese	20	Fish farmer

Source: Fieldwork 2013; *questions asked in English

In addition to the group interviews, passive direct observations were undertaken, where the observer plays a role of bystander and does not directly engage with study population (DeWalt et al. 1988). This method is also called covert observation because the study population is often unaware that they are being observed (Gajendragadkar et al. 2013). In this case, the purpose of field-based observations was to achieve what Patton (2002) called direct contact with physical environment and people and to understand realities. As such, attention was paid to tourists' movements, time spent in different locations and types of activities undertaken. Photographs were taken in order to document sites and provide a record of activities of tourists and community members.

3.1 Pulau Kukup and its surroundings

Pulau Kukup (Kukup Island) is located between 01°19'N and 103°25'E on the shores of Southern Peninsular Malaysia's Johor State. The total area of this mangrove island is 6.47 km^2. Pulau Kukup offers physical protection of shoreline and acts a barrier against strong winds and tides for the low-density coastal settlement. According Cheang (2003), Pulau Kukup is the world's second largest

mangrove island. Its mangrove tidal forest trees grow up to 30 m and its mudflats are exclusive habitats for 12 vertebrate species and 23 bird species. Birdlife International (2007) reported that species covering a range of IUCN conservation categories are found in Pulau Kukup. These include: the Lesser Adjutant stork (*Leptoptilos javanicus* - threatened), Milky Stork (*Mycteria cinerea* - endangered), Chinese *Egret (Egretta eulophotes* - vulnerable), Common Redshank (*Tringa tetanus* - least concerned), White-winged (*Tern Chlidonias leucopterus* - least concerned), and the Straw-headed Bulbul (*Pycnonotus zeylanicus* - vulnerable).

Although Pulau Kukup is uninhabited by humans, merely 1 km separates it from Kukup village, which comprises three major settlements: Kukup, Kampung Sungai and Kampung Air Masin (Hampton, 2010). Kukup village is a type of settlement called a parallel water village and it is located on swamps. Its houses are connected by pedestrian walk ways (Hassan, 2010). The area has been settled by people of various ethnic backgrounds since before the 1870s (Tachimoto, 1994). Recently, Pulau Kukup has become an important ecotourism hub, receiving 90,229 local and international tourists during the period 2010-2012 (Sanmargaraja and Wee, 2013). According to Hampton (2010), the mainstay of Kukup village economy is gastronomy tourism, focused on high-quality seafood eateries. The author estimates the settled population of the Kukup fishing village at around 1000, with most inhabitants being Hokkien Chinese.

The island was designated as Ramsar Site No. 1287 under the Ramsar Convention on 31st January, 2003 (Giesen et al. 2007). According to Michel and Zahler, (2015), the earliest people that inhabited the surroundings of Pulau Kukup were nomadic fishermen. Therefore, fishing became an enduring economic activity that has become part of the culture, history, food security, and landscape systems of the area. In the pre-colonial days, most parts of Malaysia, including Kukup, enjoyed a customary land tenure system, known as *adat,* which determined the nature of resource use regimes. According to Ngidang (2005:50), the *adat* system is "instrumental for maintaining law and order and provides a state of balance between individuals, between individuals and community, and between community and the environment, both physical and spiritual". The *adat* system also provides for rules of access and land ownership rights through inheritance, access to public goods, protection of the commons, and inter-generational transfers. However, until recently, the subsequent colonial and post-colonial laws of Malaysia failed to guarantee and or establish the rights of communities to own the lands they have occupied for generations (Xanthaki, 2003).

Neglect of the rights of local people by the colonial and post-colonial land tenure systems influenced the top down conservation policies on this ecosystem. Historically, local people inhabiting the surroundings of Pulau Kukup freely exploited its mangroves for the production of poles and charcoal, until 1923, when it was designated as a forest reserve (Jusoff, 2008). Several mechanisms were introduced to regulate local access to ecosystem goods and services which included the need for permission to be gained for the local commercial production of firewood in 1947. Subsequently, regulated pole production was permitted between 1950s and 1960s. Then, an integrated approach for local production, conservation and protection of coastal areas was introduced in 1972. In 1997

the government of Johor State gazetted Pulau Kukup as a state park for tourism and conservation purposes (Wetlands International, 2007). Jusoff (2008) reported that between 2000 and 2009, Pulau Kukup became a subject of intergovernmental conservation and development interest through a collaboration project between the Johor Forestry Department and the Danish Cooperation for Environment and Development. The collaboration was responsible for launching long-term management, conservation and protection activities, as well as rehabilitating degraded areas in the Kukup Ramsar site. According to the Asian Development Bank report *State of the Coral Triangle: Malaysia* (2014), several laws in Malaysia such as the Fisheries Act 1985, the Environment Quality Act 1974, the National Forestry Act 1984, the Wildlife Protection Act 2010, the National Parks Act 1980 support today's wetland governance. Indeed, the interplay of restrictions focusing on conservation are considered to have improved the area's ecological integrity. Azlan and Othman, (2009) found that the areal size of Pulau Kukup Ramsar has increased by more than 10 ha in a decade and this is most probably due to the existing conservation measures which include the area's designation as a Ramsar site.

4. Results and Discussion

This section directly addresses the study's research questions: how does designation of a wetland as a Ramsar site undermine communities' access to ecosystem services? How do communities exploit the benefits of labelling ecosystems as Ramsar sites/conservation areas and what are the socio-ecological benefits and threats? It sets out the findings in the context of the literature and shines light on the implications for access to resource use and related opportunities. It also highlights the need for governance to respond to emerging challenges.

4.1 Ecosystem services in Pulau Kukup Ramsar site

Pulau Kukup provides a wide range of ecosystem services, such as soil formation in its mudflats, nutrient cycling, refugia functions for migratory birds, conservation of genetic flora and fauna species, ecotourism, fish habitat, and so on (Giesen et al. 2007; Lim et al. 2012). Collectively, these functions represent provisioning, regulating, supporting, and cultural ecosystem services. In answering the first research question, "how does designation of a wetland as a Ramsar site undermine community's access to ecosystem services?" Respondent 2A noted that "a few years ago fishermen used to make offerings to the god of the sea to seek for his protection. This ritual was forced to stop after Kukup was designated as a conservation area." This opinion demonstrates a mismatch between national and international conservation institutions, showing how access to certain areas can be restricted, prioritising the protection of certain ecosystem services. The blocking of fishermen from accessing Pulau Kukup for rituals is in line with the existing Johor State conservation laws set for the park (Jusoff, 2008). However, this contradicts the principles of wise and equitable use supported by the Ramsar Convention and CBD (Ramsar Convention, 2008; CBD,

2006). Such discrepancies in the implementation of international environmental conventions for ecosystems need to be addressed in the interest local people and environmental justice.

The second research question asked: how do communities exploit the benefits of labelling wetlands as Ramsar sites/conservation areas and what are the socio-ecological benefits and threats? According to Respondent 7B, "the designation of Pulau Kukup as a Ramsar site has made it one of the best-known sites for ecotourism in Malaysia." Eight other respondents held the same positive view on the role of labelling Pulau Kukup as a Ramsar site. The influx of nearly 100,000 local and international tourists into the area within two years (2010-2012) illustrates its rising popularity as a tourist site (Sanmargaraja and Wee, 2013). The community has demonstrated a good understanding that the survival of this mangrove island is crucial for the local economy. For example, Respondent 1A noted that "if Pulau Kukup disappeared, businesses in Kukup village will also decline considerably." It seems that the local people are supportive of the strict implementation of the restricted use of the wetland in spite of its drawbacks in the way of access.

In some ways, the restricted access maps neatly onto local beliefs and perspectives. According to Respondent 8C "the Malays believe that Pulau Kukup is an abode of spirits and that is why it is uninhabitable". Respondents 5B and 6B suggested that conservation of Pulau Kukup "is for the permanent good of the locals". While local cultural and historical values of wetlands are neglected in the current governance regime, communities nevertheless understand that the access restrictions provide longer-term benefits. At the same time, local people have benefitted from improved land tenure security.

4.2 Land tenure change and vulnerability of wetlands

Historically, the *adat* system has been instrumental in maintaining a balance between communities and ecosystems through communal ownership (Ngidang, 2005). In the past, customary tenure systems determined how people utilised a wide range of environmental resources in and around the shores of Kukup village without pushing Pulau Kukup into extinction. Indeed, previous studies have observed the predominance of wooden houses standing on stilts (Hampton, 2010; Hassan, 2010). Contrastingly, findings from the current study's fieldwork reveal a rather dramatic change in the morphology of the settlement. Currently, most of the residential structures were built with permanent structures that appeared quite new, while some were still under construction during the fieldwork. According to Respondent 2B, the Johor State Government offered people permanent land titles in 2012 and this came "after nearly 100 years that many family generations kept holding temporary land titles". The same respondent claimed that "over 300 people have benefited" from this land tenure security initiative of the Johor State Government. She added that "this delayed action has now brought more development to the area and has improved human well-being."

In addition, the field-based observations provided insight into understanding how the recent changes in land tenure regimes pose risks to the sustainability of Pulau Kukup Ramsar site. The previous temporary land tenure arrangements discouraged pressure on the coastal areas, as most of

the buildings were made from locally-sourced materials. The acquisition of permanent land titles has spurred a massive transformation of the Kukup village, particularly along its low-elevation coastal areas. New concrete buildings overlooking the Pulau Kukup Ramsar site have been developed. Invariably, this has added more pressure on the swamps and stamped out the traditional and environmentally-friendly morphology of the area. At the same time, the change in land tenure security has created multiple opportunities for people, particularly through the ways it boosts the local tourism industry. According to Respondent 1A "tenure security has boosted the confidence of the local community that companies will not take over the land." The respondent added that "previously, some people moved out of this community in spite of opportunities, simply due to this uncertainty."

4.3 Sustainability of local fish farming (*kelong*)

The fishing industry has flourished in Kukup village and its surroundings for centuries and it has become one of the bold features of its cultural landscapes (Tachimoto, 1994; Hassan 2010; Michel and Zahler, 2015). It is evident that local people have been able to maintain some aspects of their indigenous knowledge and livelihood options. The relatively small-sized fish farms located between Kukup village and Pulau Kukup were constructed using wood, nets and ropes that are sourced locally. Although, the *kelongs* cover only a few square meters, the fish and seafood cultivated for local sale and exports are good sources of income for the local people. Respondents 9C, 11D, and 12D believed that "water is a natural gift" for their business. According to Respondent 10D, the *kelong* business became more popular when the fish stocks in the waters of Straits of Malacca started depleting progressively a few decades ago. However, Respondent 9C opined that, "demand for some uncommon fish species and seafood has also boosted the *kelong* business". *Kelong* therefore helps in preserving the diversity of aquatic species.

Field observations showed that the anglers sell many types of fish and seafood to chains of restaurants in and around Kukup. They also export their products to Singapore, Hong Kong, and Taiwan among others. The floating farms may also benefit from ecological functions of Pulau Kukup. The concentration of fishing activity around Pulau Kukup is because mangrove swamps are naturally rich areas for fishing (Yahaya, 2003; Juliana et al. 2014; Latiff and Farida-Hanum, 2014).

4.4 Tourism and recreation in Pulau Kukup Ramsar site

The tourism industry is a major beneficiary of wetlands as half of all international tourists visit wetland areas (Secretariat of the Ramsar Convention on Wetlands and World Tourism Organisation, 2012). Tourism in Pulau Kukup can be broadly categorised into ecotourism and holidaymaking. The former involves visits to Pulau Kukup Ramsar site and the latter involves visiting sea food restaurants (gastronomy tourism), leisure activities, and night time recreational activities. Visits to *kelong* platforms have also become part of the major sites that tourists visit before or after going to Pulau Kukup. Some 20 or more tourists can visit one *kelong* at a time. Most of the *kelongs* also host

shops that sell seafood, herbs, and souvenirs. This section considers the different types of tourist activities and their implications for the Ramsar site.

Being the world's second largest uninhabited mangrove swamp island, Pulau Kukup is a good site for watching nature. In response to the question relating to the functions of the Ramsar site, Respondent 7B stated that Pulau Kukup served as a "good spot for researchers from within Malaysia and beyond." Going by the number of different fish and aquatic species seen at *kelong* sites, it is possible that tourist visits to *kelongs* can be considered as another form of ecotourism as it involves displays of different fish species that tourists can feed for fun. These activities are important for the local economy, as it was observed that some tourists spend only a few hours in Pulau Kukup.

Although ecotourism is the mainstay of Kukup Laut, Hampton (2010) identified gastronomy tourism as one of the key activities in the area. Chains of restaurants offer a variety of seafood for holidaymakers from morning until late evening during the weekends. Home-stays are another flourishing business, whereby tourists are accommodated in purpose-built, well-furnished homes. A typical home-stay facility in Kukup can accommodate fifteen people or more at a time. According to the respondents, most of the residents of Kukup were elderly people as most of people of working age stay in cities and other bigger towns and only visit Kukup occasionally. According to Respondent 11D, "some absentee homeowners consider home-stay facilities as investments." Observations showed that many tourists took their dinner in their home-stay facilities as part of their tour package. Thus, in the evenings, most of the backyards were busy with tourists who spent time enjoying chicken, seafood or barbecued fish.

It was observed that after taking dinner some tourists engage in recreational activities. For instance, some of them watched or lit fireworks at night. Nevertheless, the most common recreational activity observed was karaoke, which is usually performed indoors. Some tourists also engaged themselves in walking around the interconnecting paved walkways of the village. In general, people felt the tourism industry has improved the lives of the community members. This was confirmed by Respondent 4A who noted that "20 - 30 years ago, many people in this community were very poor. Now things have improved for the people through the tourism industry." In other words, the tourism industry, which depends on the conserved ecosystem, contributes substantially to poverty alleviation. Conservation has helped the local economy to grow substantially.

4.5 Community Induced Threats to Ramsar sites

Based on observations from the sites in this study, it is critical for conservation authorities to establish measurable thresholds between community use of ecosystem services and vulnerability of wetlands. In the case of Kukup village and its surroundings, the residential areas standing on the shallow waters have continued to rely on rising and receding water tides for household toilet waste disposal. As homes depend on this natural cleaning method, Respondents 2A and 4A mentioned that "this practice has been the tradition in this locality for ages". However, Respondent 3A noted

that, "the faecal material serves as food for aquatic life", while Respondent 2A added that, "apart from toilet waste, the residents do not throw any domestic waste such as plastic and metals into the swamps." Nevertheless, the increasing development and influx of tourists, could, over time, negatively affect water quality and the sustainability of the marshes. Indeed, indications are that negative effects are already being experienced. The fishing areas around Kukup have recently experienced the massive decimation of fish stocks due to infections from microbial organisms (Jaafar et al. 2014). Prior to this, Diego-McGlone and Dupra (2005) observed that untreated sewage is responsible for eutrophication which is one of the major threats to seas and wetlands in Southeast Asian countries. Thus, it is imperative for the local community and the authorities to give top priority to sanitation. As Hampton (2010) observed, poor sanitation undermines the prosperity of Kukup tourism industry. Pollution of swamps may also affect some species such as mudskipper (*gobiidae*) swamp snakes, and lobsters (*Procambarus clarkii*) that are found abundantly below the houses. Hence, it is imperative to integrate social and ecological dimensions in developing governance mechanisms that can allow people to more sustainably exploit the opportunities of being close to Ramsar sites.

5. Conclusion

By scrutinising access and allocation of ecosystem services in one of the unique Ramsar sites, this study sheds light on the complexity of governance of ecosystem services. This study has shown that national institutions for governing biodiversity and ecosystem services do not implement some of the principles of wise use, as ordained by the Ramsar Convention. This failure to fully implement international multilateral agreements such as the Ramsar Convention is a potential area to explore in further studies on the effectiveness of local governance arrangements to support multilateral environmental agreements (MEAs). Our study has also shown that in order to understand the current state of access and allocation of ecosystem services, it is imperative to consider the historical evolution of wetlands and local people's interactions. Without understanding the dynamics of the local community and ecosystem relations, it will be difficult to understand and evaluate the current state of this relationship and the new and emerging risks to sustainability that such changes may bring. Another critical conclusion is that the mere designation of an ecosystem as a Ramsar site can improve and diversify economic opportunities for local communities, particularly through the tourism industry. The study also illustrated a positive side to the top down approach to ecosystem service governance used in the area, where it is shown to have improved the ecological integrity of ecosystem. Despite the trade-off created between strict conservation rules and the direct and indirect benefits that people draw from tourism activities, the respondents in this study were found to be comfortable with more top down governance approaches. Such public acceptance and confidence in international, national conservations institutions and policies seems highly dependent upon the level of the overall prosperity of national economy and public wellbeing. Looking to the future, for positive relations between people and environment to continue in the area, it will be imperative for governance systems to take proactive measures in order to address challenges of sanitation, which this study has identified as a key threat to the sustainability of the wetland ecosystem.

Acknowledgements

Special thanks to Associate Professor Dr Lee, Universiti Teknologi Malaysia, Johor

Reference

Aber, J.S., Pavri, F., Aber, S.W. (2012). *Wetland environments: A global perspective*. Wiley Black, Chichester

Aminu, M., Ludin, A.N.M., Matori, M., Yusof, K.M., Dano, L.U. and Chandio, I.A. (2013) A spatial decision support system (SDSS) for sustainable tourism planning in Johor Ramsar sites, Malaysia. *Environmental Earth Sciences*, 70(3) 1113-1124.

Asian Development Bank (2014) State of the Coral Triangle: Malaysia, ADB, Manila

Azlan, N. and Othman, R. (2009) Monitoring of Mangrove Areas Using Remote Sensing toward Shoreline Protection. Proceedings of GIS Osrava, Malaysia.

Barbier E. B. (2011). Wetlands as natural assets. *Hydrological Sciences Journal*, 56(8), 1360-1373

Barrot, S. et al. (2015) Evolving away from the linear model of research: a response to Courchamp et al. Trends in Ecology and Evolution. 30

Benerjee, S. (2013) The march of the mega-city: Governance in West Bengal and the wetlands to the East of Kolkata. Südasien-Chronik - South Asia Chronicle 93-118 Südasien-Seminar der Humboldt-Universität zu Berlin

Biermann,F.,Betsill,M.,Gupta,J.,Kanie,N.,Lebel,L.,Liverman,D.,Schroeder,H.,Siebenhuener,B., and Zondervan, R.,(2010) Earth system governance: a research framework. *Int Environ Agreements*, 10:277–298.

Biermann, F., Davies, O and Grijp, N. (2009) Environmental policy integration and the architecture of global environmental governance. *Int Environ Agreements*. 9:351–369.

BirdLife International (2014) Important Bird Areas factsheet: South-west Johor coast. Downloaded from http://www.birdlife.org on 05/04/2014

Braat, L.C. and de Groot, R. (2012) The ecosystem services agenda: bridging the worlds of natural science and economics, conservation and development, and public and private policy. *Ecosystem Services*, 1(1), 4-15

Cheang, M. (2003) Protecting mangrove sites. The Star Online. Star Publications (Malaysia) Bhd

http://www.ecologyasia.com/news-archives/2003/may-03/thestar_20030513_2.htm

461 Convention on Biological Diversity (2006) Global Biodiversity Outlook 2. Secretariat of the
462 Convention on Biological Diversity, Montreal.

463 Courchamp, F., Dunne, J.A., Maho, Y.L., May, R.M., Thébaud, C., and Hochberg, M.E. (2015) Back
464 to the fundamentals: a reply to Barot et al. Trends in Ecology and Evolution 30(7), 370–371.

465 DeWalt, K. M., DeWalt, B. R., and Wayland, C. B. (1998). Participant Observation. In H. R. Bernard
466 (eds.), *Handbook of methods in cultural anthropology*. AltaMira Press, California
467
468 Diego—McGlone, M.L.S and Dupra, V. (2005). Anthropogenic drivers for nitrogen and phsporous
469 in southeast Asia. In: Crossland, C.J.; Kremer, H.H.; Lindeboom, H.J.; Marshall Crossland, J.I.; Le
470 Tissier, M.D.A. (Eds.) *Coastal Fluxes in the Anthropocene.* IGBP/Springer, New York
471
472 Farrier, D. and Tucker, L. (2000) Wise use of wetlands under the Ramsar Convention: a challenge
473 for meaningful implementation of international law. Journal of Environmental Law12 (1): 21-42.
474
475 Fletcher, S., Kawabe, M. and Rewhorn, S. (2011) Wetland conservation and sustainable coastal
476 governance in Japan and England. *Mar Pollut Bull.* 62(5):956-62.

477 Giesen, W., Wulffraat, S., Zieren, M. and Scholten, L. (2007) *Mangrove Guidebook for Southeast Asia*.
478 FAO and Wetlands International

479 Gómez-Baggethun, E. and Barton, D.N. (2013) Classifying and valuing ecosystem services for urban
480 planning. *Ecological Economics*, 86 235-245

481 Gajendragadkar, P. R et al. (2013) The survival time of chocolates on hospital wards: covert
482 observational study. *BMJ* 347, 7198.

483 Guerry, A.D., Polasky, S., Lubchenco, J., Chaplin-Kramer, R., Daily, G.C. and Griffin, R. (2015)
484 Natural capital and ecosystem services informing decisions: From promise to practice. Proc Natl
485 Acad Sci U S A. 2015 Jun 16; 112(24): 7348–7355.

486 Gupta, J. and Lebel, L. (2010). Access and allocation in earth system governance: Water and climate
487 change compared. *International Environmental Agreements: Politics, Law and Economics,* 10(4)

488 Guzman Ruíz, A, Hes E and Schwartz K, (2011) Shifting governance modes in wetland
489 management: a case study of two wetlands in Bogotá, Colombia. *Environment and Planning C:*
490 *Government and Policy* 29(6), 990 – 1003.

491 Jaafar, S.A, Lati,f M.T., Chian, C.W., Han W.S., Wahid, N.B., Razak I.S., Khan, M.F. and Tahir,
492 N.M. (2014) Surfactants in the sea-surface microlayer and atmospheric aerosol around the southern
493 region of Peninsular Malaysia. Marine Pollution Bulletin, 84, 35–43

494 Jax, K., Barton, D.N., Chan, K.M.A et al. (2013). Ecosystem services and ethics. *Ecological Economics*,
495 93, 260-268.

Jusoff, K. (2008) Managing Sustainable Mangrove Forests in Peninsular Malaysia. Journal of Sustainable Development, 1, (1)88-96.

Lim, H.C., Leaw, C.P., Tan, T,H., Kon, N.F., Yek, L.H., Hii, K.S., Teng, S.T. (2014) A bloom of Karlodinium australe (Gymnodiniales, Dinophyceae) associated with mass mortality of cage-cultured fishes in West Johor Strait, Malaysia, Harmful Algae, 40, 51-62,

Ramsar: The Convention on wetlands. The introductory Ramsar brochure, Third Edition. http://www.ramsar.org/cda/en/ramsar-about-introductory-ramsar/main/ramsar/1-36%5E16849_4000_0__

Griffin, P. (2012) The Ramsar Convention: A new window for environmental diplomacy? Research Paper Series. Institute of Environmental Diplomacy and Security, University of Vermont

Gómez-Baggethun, E., Kelemen, E., Martín-López, B., Palomoc, I. and Montes, C (2013) Scale Misfit in Ecosystem Service Governance as a Source of Environmental Conflict. Society & Natural Resources: An International Journal 26(10),1202-1216

Hampton, M.P. (2010) Enclaves and ethnic ties: The local impacts of Singaporean cross-border tourism in Malaysia and Indonesia. *Singapore Journal of Tropical Geography* 31(2), 239-253.

Hassan, A.S. (2010) Fishing Villages: Resemblance to the pre-colonial city landscape at the Straits of Malacca in Peninsular Malaysia. *The Arab World Geographer*, 13(2) 93-107

Higgins, V., Dibden, J., Potter, C., Moon, K. and Cocklin, C. (2014) Payments for Ecosystem Services, neoliberalisation, and the hybrid governance of land management in Australia. Journal of Rural Studies, 36, 463-474.

Horowitz, L.S. (2013) Toward empathic agonism: conflicting vulnerabilities in urban wetland governance. *Environment and Planning A*, 45, 2344 – 2361.

Iarossi, G. (2006). The Power of Survey Design: A User's Guide for Managing Surveys, Interpreting Results, and Influencing Respondents. The World Bank, Washington D.C.

Juliana, W.A.W., Razali, M.S. and Latiff, A. (2014). Distribution and rarity of Rhizophoraceae in Peninsular Malaysia. In Faridah-Hanun, Latif, A., Hakeem, K.R. and Ozturk, M. (eds.) Mangrove Ecosystems in Asia: Status, Challenges, and Management Strategies. Springer, New York.

Kalfagianni, A. and Pattberg, P. (2013) Fishing in muddy waters: Exploring the conditions for effective governance of fisheries and aquaculture, *Marine Policy*, 38, 124-132

Kantor, M. (2013) Banking on the Impossible: The Political Life of Wetlands in Southern Louisiana. Thesis Submitted in partial fulfilment of the requirements for the degree of Master of Arts in Geography. Syracuse University Geography

528 Latiff, A. and Faridah-Hanum, I. (2014) Mangrove ecosystem of Malaysia. Status, Chalen ges and
529 management Strategies. In: Faridah-Hanum, Latif, A., Hakeem, K.R. and Ozturk, M. (2014) *Mangrove*
530 *Ecosystems in Asia: Status, Challenges, and Management Strategies*. Springer, New York

531 Lim, K.S., Ding, L. Y., Lum, W.W. and Lim, K.C (2012) Birding the tip of the Malay peninsula: bird
532 diversity and birding sites in Johor. BirdingASIA 17, 81–93
533
534 Maes, J., Egoh, B., Willemen, L., Liquete, C., Vihervaara, P., Schägner, J.P., Grizzetti, B., Drakou,
535 E.G., Notte, A.L., Zulian, G., Bouraoui, F., Paracchini, M.L., Braat, B., and Bidoglio, G.(2012)
536 Mapping ecosystem services for policy support and decision making in the European Union.
537 *Ecosystem Services,* 1 (1), 31-39

538 Maniam, A. and Singaravelloo, K. (2015) Impediments to Linking Forest Islands to Central Forest
539 Spine in Johor, Malaysia. *International Journal of Social Science and Humanity*, 5(1)22-28.
540

541 Michel, S. and Zahler, A-K (2015) Cultivated Sea – Fishing and Aquaculture in the Metropilitan
542 Reegion. ETH Zurich.

543 Ministry of Natural Resources and Environment (2014) 5th Report to Convention on Biological
544 Diversity. MNRE, Putrajaya

545 Moore, P., Pholsena, M., Phommachanh, K. and Glémet, R. (2013) *Review of statutory and customary law*
546 *in the Xe Champhone Ramsar site, Lao.* International Union for Conservation of Nature and Natural
547 Resources, Gland

548 Naeem, S., Ingram, J.C., Varga, A., Agardy, T., Barten, P. and Bennett, G. (2015) Get the science
549 right when paying for nature's services. Science, 34 , 1206–1207.

550 Ngidang, D. (2005) Deconstruction and Reconstruction of Native Customary Land Tenure in
551 Sarawak. Southeast Asian Studies, 43, 47-75.

552 Orchard SE, Stringer LC, Quinn CH (in press 2015) Mangrove system dynamics in Southeast Asia: linking
553 livelihoods and ecosystem services in Vietnam, *Regional Environmental Change*. doi: 10.1007/s10113-
554 015-0802-5

555 Ramsar Convention (1971). *Ramsar Convention on Wetlands of International Importance*. Gland Ramsar
556 Convention Secretariat.

557 Sanmargaraja, S. and Wee, S.T. (2013) Constraints of alternative tourism in Malaysia. *International*
558 *Journal of Advances in Management, Technology and Engineering Sciences* 2(12)9-12

559 Schuyt, K and Brander, L. (2004) *The economic values of the world's wetlands*. WWF Gland/Living Waters,
560 Zeist

561 Paavola, J. and Hubacek, K. (2013). Ecosystem services, governance, and stakeholder participation:
562 an introduction. *Ecology and Society* 18(4),42.

563 Secretariat of the Ramsar Convention on Wetlands, Gland, Switzerland, World Tourism
564 Organization (2012) Destination wetlands: supporting sustainable tourism. UNWTO Madrid, Spain

565 Patton, M.Q. (2002). *Qualitative research and evaluation methods*. Sage, Thousand Oaks, California.

566 Tachimoto, N.M. (1994) Coping with the Currents of Change: A Frontier Bugis Settlement in Johor,
567 Malaysia. *Southeast Asian Studies* 32,(2)197-230

568 ten Brink P., Russi D., Farmer A., Badura T., Coates D., Förster J., Kumar R. and Davidson N.
569 (2013). *The Economics of Ecosystems and Biodiversity for Water and Wetlands*. The Institute for European
570 Environmental Policy, London /The Ramsar Convention

571 Wetlands International (2007) Ramsar Sites in Malaysia.
572 http://malaysia.wetlands.org/WHATWEDO/Allourprojects/tabid/513/ArticleType/ArticleView/
573 ArticleId/128/Ramsar-sites-in-Malaysia.aspx

574 Xanthaki, A. (2003) Land Rights of Indigenous Peoples in South-east Asia [online]. Melbourne
575 Journal of International Law, 4, 2, 467-496.

576 Yahaya, J. (2003) Coastal resource development in Malaysia: Is there a need for sustainable
577 mangrove forest management? Faculty of Economics and Administration Working Paper No. 2003-
578 2.

579

580

581

582 Ayre, M. and R. Nettle (2015). "Doing integration in catchment management research: Insights into
583 a dynamic learning process." Environmental Science & Policy 47: 18-31.

584 Biermann, F. (2012). Planetary boundaries and earth system governance: Exploring the links.
585 Ecological Economics, 81, 4-9.

586 Biermann, F. (2013) What is Earth systemgovernance? Interview with Jon Turney.

587 http://www.futureearth.info/2013-jul-15/whatearth-system-governance (viewed on July 17, 2013)

588 **Diaz et al. 2015** The IPBES Conceptual Framework — connecting
589 nature and people. Current Opinion in Environmental
590 Sustainability, 14, 1-16.

Joshi, G. (2012). Quantification and valuation of some selected forest ecosystem services in the Western Himalayan region. Ph.D. Thesis, Kumaun University, Nainital.

Joshi

Schroeder, H. (2014) Governing access and allocation in the Anthropocene. Global Environmental Change, 26, A1-A3.