

ORIGINAL ARTICLE

Assessing Natural Capitals for Sustainable Ecotourism in Tasik Chini Biosphere Reserve

¹A. Habibah, ²I. Mushrifah, ¹J. Hamzah, ¹M.E Toriman, ¹A Buang, ³K. Jusoff, ¹M.J. Mohd Fuad, ¹A.C. Er & ¹A.M. Azima, ²A Habibah

¹*School of Social, Development and Environmental Studies Faculty of Social Sciences and Humanities Universiti Kebangsaan Malaysia Bangi 43600*

²*Pusat Penyelidikan Tasik Chini Faculty of Science and Technology Universiti Kebangsaan Malaysia Bangi 43600*

³*Faculty of Forestry, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

A. Habibah, I. Mushrifah, J. Hamzah, M.E Toriman, A Buang, K. Jusoff, M.J. Mohd Fuad, A.C. Er & A.M. Azima, A Habibah: Assessing Natural Capitals for Sustainable Ecotourism in Tasik Chini Biosphere Reserve

ABSTRACT

Ecotourism is well accepted as the panacea for achieving sustainable development, especially in the protected areas including the Biosphere reserves. Being a resource based activity; ecotourism is highly dependent on the natural capitals available in the areas and to some extent, own and inherited by the locals. In fact, ecotourism sustainability does not only lie on the locals' responsibility, but must be appreciated by all stakeholders who rely on the natural capitals in offering the ecotourism experiences and businesses. Nevertheless how each of the stakeholders perceived the natural capital is still understudied especially in seeking for a balance perspective between conservation and ecotourism development. Based on this backdrop, this article aims to assess the stakeholders' perspectives of the natural capitals for sustainable ecotourism in Tasik Chini Biosphere Reserve. The findings reveal that every stakeholder has their own positive and negative opinions on the sustainability of natural capitals. Nevertheless, there seems an agreement of valuing natural capital as important resources though some assert on the decline of the natural capital was due to the encroachment of new development forces. It is imperative that a study on mapping the natural capital within the stakeholders' perspectives will contribute to a more holistic approach in managing and attempt to risks of natural capital in the near future.

Key words: ecotourism, natural capital, sustainability, Biosphere reserve, four tiers perspectives

Introduction

Ecotourism is one of the essential sectors often opted for by both public and private stakeholders of developing countries in responding to issues to sustainability of ecosystem, livelihood, cultural preservation, and biodiversity conservation (Lai & Nepal 2006, Gurung & Seeland 2008, Campbell 1999, Honey 2008, Reynolds *et al.* 2010). Being a sector which guarantees a pristine and serenity of natural attraction as well as low impact development (Goslings 1999, Blangy & Mehta 2006), ecotourism is a viable means for managing and sustaining natural resources for a designated area of a Biosphere Reserve (Lu *et al.* 2007, Xu. *et al.* 2006, Wallner *et al.* 2007). The central reason why ecotourism becomes an alternative in Biosphere Reserve is its similarity and close relationship of ecotourism functions with the Biosphere Reserve's function in valuing its natural capitals for conservation, development and learning. In fact, of the 546 Biosphere reserves around the world, many have witnessed the successful ecotourism practices and development (Kuřová *et al.* 2007, Bonheur & Lane 2002, Wallner *et al.* 2007). One of the critical success components is the natural capital, which clearly stresses on the synergy of mechanism and multi-stakeholders, to work, conserve and manage the natural capitals (De Groot *et al.* 2003, Reynolds *et al.* 2010). Simply put, the natural capital needs to be understood at all levels of users, actors and beneficiaries, most important the local community-tourist-tourism providers and the scientists community, working in ecotourism.

Although considerable knowledge pertaining to the planning, development and management exist in the literature of ecotourism (Goslings 1999, Stronza & Gordillo 2008, Honey 2008), research on ecotourism in the Biosphere reserve that utilised the knowledge of natural capitals derived from the four tiers' perspectives – local community, tourists, tourism providers and academia is still fragmented. The existing studies either took one or two perspectives to explore on the natural capitals in ecotourism. In fact, it was over-estimated in the economic or ecological perspective, often, from the eyes of the capitalists or outsiders compared to a more holistic perspective, especially from the eyes of the locals.

While ecotourism principles call for the parity in utilising and managing resources, many of the findings that neglect the integration of natural capitals from local perspectives, have resulted only limited benefits to those locals residing in the area (Masozera *et al.* 2007, Liu *et al.* 2010). In fact Liu *et al.* (2010) agreed to the fact that ignoring local people's interests and excluding them from the planning, management, and decision making for the protected areas are the main source of conflicts between local people and the designated areas. Vice versa, due consideration given to the local involvements had shown positive impacts including becoming the 'safeguard' or 'crusader' of the ecosystem (Vodouhê *et al.* 2010, Stronza & Gordillo 2008). Taking the example from three aboriginal communities, *sasi of Maluku island*, 'vanua' of Fiji; and *Netukulimk* of Prince Edward Island, Novacrek (2008) provides evidence on how rituals add values on ecological conservation practices, affirming the community's commitment toward respecting, protecting and conserving their own ecology.

More recently the natural capital (NC) had been receiving more recognition in terms of its values and applicability for devising and assessing sustainable development. Natural Capital (NC) is the natural environment from which emanates the goods and services that sustain life. Being the basis for human activity and well-being, NC can be broadly described as renewable or active NC and non-renewable or passive NC (Costanza & Daly 1992). In fact the current research had move beyond the ecological approach of natural capital to a more critical natural capital, and extend its locality to a wider regional measurement (Bailey *et al.* 2006, De Groot *et al.* 2003, Macdonald *et al.* 1999). More recent, studies showed that the locals have their own understanding on the meanings of natural capital, and given proper channels, their articulations has helped to generate more localised programme for natural resources conservation (Honey 2008, Stanza & Gordillo 2008, Bodin & Crona 2008). Therefore in assessing the state of natural capital for the purpose of achieving sustainable ecotourism, qualitative interpretation of those involved in the production should be considerably attempted.

Like other Biosphere Reserves, Tasik Chini, being accorded as the first Biosphere Reserve in Malaysia in 2009, is also aiming at enhancing ecotourism to achieve sustainable development. Tasik Chini is endowed with rich biodiversity; therefore undoubtedly there exist huge potentials and prospects for undertaking ecotourism as a means for achieving sustainable Biosphere reserve. However, results of the studies in the late 1990s and in the early 2000 had shown an obvious reduction in tourist arrivals. While the previous studies clearly assert on the improper development for ecotourism, little is known on the components of natural capitals that have been threaten and can bear to withstand the problems.

Even some had condemned on the development of infrastructures for mass ecotourism which disturb the natural ecological process of the lake, and also the authenticity of the aboriginal dwellings. More pertinent, the knowledge and properties of natural capitals seen from various stakeholders especially from the local community, tourists, tourism providers and the scientists working in the area were not fully utilised to provide, develop and promote ecotourism experiences in Tasik Chini. Therefore taking the four tiers perspective in constructing the natural capital is in tandem with the biosphere reserve which encourages research for development, learning and implementation.

Realising the pressing needs for conservation and restoration of natural capital not only to increase tourist arrivals and raise ecotourism attraction-experiences, but in essence of practicing real sustainable ecotourism, it is therefore vital to assess natural capitals in a holistic perspective. It is believed that the utilisation of the four tiers perspectives in assessing natural capitals, an integrated ecotourism development approach will be derived and agreed upon within those stakeholders who depend, work and live in the area. Based on the study undertaken in 2010 and 2011, this article aims to assess natural capitals from four tiers of perspectives; community-tourist-tourism providers and scientists in offering sustainable ecotourism experiences in Tasik Chini Biosphere Reserve.

Defining Natural Capitals for Sustainable Ecotourism:

There is a voluminous literature on natural capitals; focusing on its definition and concepts, application and measurement, ranging from only as simple as composing the natural environment or natural resources to the more complex task, exploring the criticality of natural capital and application of robust modelling of regional natural capital (Ekin *et al.* 2003, Azqueta & Sotelsek 2007, Ulgiati *et al.* 2011). Being the most commonly cited definition, Constanza and Daly (1992), defined natural capital as the stock of natural ecosystem that yields a flow of valuable ecosystem goods or services into the future. However, Ruggeri (2009) suggests the existing definitions of natural capital contain sufficient differences to allow a breakdown into four categories. The first

group identifies natural capital as a stock of natural resources used in the production of market goods and services, the second group, includes ecosystem services while maintaining a link between natural capital and the production of goods and services. The third group acknowledges the benefits of nature extend beyond traditional economic activities and the fourth group recognizes that natural capital as “supports life” and “is essential for our survival”.

The concept of natural capital also attempts to integrate both economic and ecological thinking by describing nature as capital rather than only a factor of production. To the ecologist and economists, natural capital is a means to convey a greater understanding between the interactions of society and the environment (Olewiler 2002). On the other hand, the environmental economists had recognized natural capital as an important contributor to human welfare, as a life support system that provides a supply of resources, as a waste receptor, and as provider of amenities (Cellados & Duane 1999). More recently, it has been used as a tool by policy makers to establish programs designed to conserve the environment, while maintaining/increasing human welfare in social, spiritual and cultural terms (Raymond *et al.* 2009, Azqueta & Solseltek 2007). Others stress on the risk and environmental security (Petrosillo *et al.* 2009, 2010), social capital and leadership at the community level (Bodin & Crona (2007) and a balance perspectives especially when the locals' livelihood is highly dependent on the natural ecosystem (Nyaupane & Poudel 2011, Bennetta *et al.* 2010).

Nevertheless several studies showed some contradictions between the locals and tourism providers with regards to the understanding and knowledge of natural resources, rights and access to natural capitals. The society regards nature or some of its attributes as socio-culturally, historically or symbolically valuable; and for some people such value cannot be meaningfully expressed in monetary terms (Mac Donald *et al.* 1999, Hinterberger *et al.* 1997). On the other hand, the economic perspective on nature portrays it as an asset providing a flow of goods and services, physical as well as aesthetic, intrinsic, and moral (Ulgiati, 2007). The overall provision of natural capital is therefore diverse, a means of life support; materials or inputs used to produce a product, species in situ, used for its “standing value” and the species used as cultural meaning for livelihood practices and enhancement (De Groot *et al.* 2003, Raymond *et al.* 2009, Haines-Young *et al.* 2006).

Besides linkages with natural resources, key determinant for sustainable development among aboriginals stemmed on its social institution. Although many agreed that members of the community may contribute different roles, several authors assert on the priority be given to the women of Indigenous. This is because women have long been custodians of valuable indigenous knowledge related to management of natural resources, including forests and their products. They often create their own locally adapted and accepted rules for the use of forests that frame their local ‘institutions’. Therefore, in assessing natural capitals, dimension from the women perspective should also be given equal concern. Further Bolland's (2006) study on the aboriginal *ejido*'s practices in managing natural resources stressed on the principles of segregation of productive activities by space, time and gender. Accordingly, different ecosystem is used for different productive activity; different activity is distributed throughout the year according to season and different work exists between men and women.

Why ecotourism is well acknowledged as a tool for sustainable development in BR can be drawn through various seminal works on ecotourism and also on the BRs (Honey 2008, Boyd & Butler 1996, Zhang & Lei 2011). The underlying reason is central to what Boyd and Butler (1996) elaborate ecotourism as possessing multi-faceted characters that support directly in sustainable development, including benefits to the resource as well as spin-offs of social, economic, political or scientific benefits.

While generally ecotourism is eco-friendly, yet, recent studies in protected areas and biosphere reserve had shown both negative and positive impacts of ecotourism. Negative impacts include denial of access to forest and natural resources and interventions of outsiders in areas (Lai & Nepal 2006, Liu 2010). Positive impacts on the other side portray the empowerment and poverty alleviation due to the introduction of community based ecotourism and pro-poor tourism. More important their engagements help them to become a more serious safeguard of the ecosystem, increased in the sense of belonging to nature surrounding them and addressed poverty (Bennetta *et al.* 2011, Gurung & Seeland 2008).

Based on the above literature, it is pertinent that the natural capitals need to be assessed not only with taking stocks of biological and physical assets, but it is important to appraise in qualitative understandings, knowledge and usage of the natural capitals from various perspectives. As ecotourism is the most viable approach to ensure sustainable ecosystem of Tasik Chini Biosphere reserve, this study utilised a four tiers perspectives: the local community, the tourists, the tourism providers and the scientists in assessing the natural capitals to determine its contribution for achieving sustainable ecotourism in Tasik Chini Biosphere Reserve.

Materials And Methods:

Tasik Chini, located in the southeast region of the state of Pahang, is the second largest natural fresh-water lake in Malaysia. Being accorded as the Biosphere reserve, Tasik Chini encompasses three functional zonation; core, buffer and transitional zones. The designated area is rich in biodiversity of wetlands. Tasik Chini was once

a popular destination of ecotourism. In the 1980s, tourists of international origin as well as domestic tourists came to Tasik Chini for its pristine nature. When the commoditization of ecotourism took place in the 90s, tourist basic infrastructures were also developed, including a weir or barrage, which later upsetting the nature of the lake. As a result, not only the ecosystem function was disturbed, the ecosystem services of the lake were also ruined and weaken, resulting drastic drop of tourist arrivals. Tasik Chini, endorsed as the first Biosphere reserve in Malaysia, thus, has many privileges to showcase sustainable approaches in undertaking conservation and low impact development in designated area.

Data Collection:

This study employed qualitative and quantitative data derived from field visits and survey conducted in 2009 and 2011. As the study seeks to apprehend natural capitals from four tiers of stakeholders, tourist, local community, tourism providers and the scientist community, therefore, accordingly, the data derived from the following programmes and surveys were utilised in the study:

i) The community perspectives were derived from several sources of data, especially from the public consultation in 2009, followed by a survey during second public consultation. Aside from the quantitative data, qualitative, observation participation was also used in assessing the diversity of natural resources. The qualitative approach comprised in depth interviews with the local leaders including Tok Batin and the women entrepreneur.

ii) The tourists' perspectives were derived from the tourist survey and questions pertaining to the natural capitals, tourist experiences and environmental awareness were solicited.

iii) The providers' perspectives were collated from in-depth interviews. These include the individuals who run the tourism services, chalet operators. Interviews provided views on conservation of natural capitals.

iv) The scientists' views were collected from their contribution in research. Data collected contributed to the taking stocks of the biodiversity, mostly from the reports, journal and focus group discussion. Recent study for the establishment of strategic implementation plan for Tasik Chini was also used.

Results And Discussion

Assessing the Natural Capital: Taking Stocks of Biodiversity:

An ecological or natural capital is an important ingredient for ecotourism. Ideally, a diverse range of natural assets, unique and pristine ecological attractions will determine the existence of quality ecotourism. Based on several scientific expeditions, Tasik Chini still withholds a strong and diverse natural capital, shown in Table 1. Aside being rich in biodiversity, Tasik Chini, comprises freshwater lake, fed by 12 feeder rivers, surrounded by state park rainforests and dominant hill areas, also provides water based and forest based attractions.

Table 1: Ecological capitals for Ecotourism

Natural capitals and components	Biodiversity status	Ecotourism purposes
Flora and fauna	<ul style="list-style-type: none"> i. Over 144 species of fish, 260 plant species, 25 aquatic plants, 46 families of insects. i. 304 species of non-aquatic vertebrates, 14 amphibians, 39 reptiles species from 12 families, 184 birds species from 40 families and 67 mammals species from 22 families 	<ul style="list-style-type: none"> i. Diversity still a strong point of ecotourism. i. Nature tourism, ecotourism birding, forest trails, sightseeing,
Water bodies, lake and rivers	<ul style="list-style-type: none"> i. 12 open water bodies called "laut" by local people. i. the second largest natural fresh-water lake, totalling 202 hectares of open water. 	<ul style="list-style-type: none"> i. Water based nature and challenge i. Scenic experience
Hills and undulating Landscape	700 ha of Riparian, Peat, Mountain and Lowland Dipterocarp forest.	<ul style="list-style-type: none"> i. Trails and serenity
Forest	Dipterocarp forest	<ul style="list-style-type: none"> i. Trails, expeditions, forest products, herbs production
Agricultural activities	Cultivate natural capital	<ul style="list-style-type: none"> i. Provide landscape and agro-based activities. Farm based aboriginal tourism,
Climate	Humid tropical climate with two monsoon periods. Annual rainfall varies, 1488 to 3071 mm.	<ul style="list-style-type: none"> i. Humid tropical climate as attraction i. Shiny and bright landscape i. Sunrise and sunset experiences
Local inhabitant as	Indigenous Jakun tribe living around Tasik Chini	<ul style="list-style-type: none"> i. Community, actor and recipient in ecological capital

Apart from water based and forest based attraction, each of these natural capital provides ecological services, namely providing sources of food to inhabitants, flood or water retention, food chain and natural habitats to the local species. This certainly add values to ecotourism attraction.

Assessing the Natural Capital from the Community Perspectives:

While Tasik Chini is considerably strong in its ecological diversity, the study seeks whether similar understandings and awareness exist among the community. Taking a wider views of the community, Table 2 shows the four community's perspectives on the importance of natural capital to their livelihood, comprised the young, women, youth and household. Based on the community household survey in two consequences years, in 2009 and 2010, findings demonstrate the consumption or usage of natural capitals, especially for the domestic uses and commercialisation in ecotourism. While partly of the local's livelihood is dependent on the existence of wetland, lake and forest, such as bathing, washing, drinking water, the natural resources also provide ecological service functions for handicraft production, ecotourism, herbal medicinal, and also for cultural tradition.

Table 2: Natural Capital and Community Practices

Natural capital	Community members	Level of uses	Existing and potentials for ecotourism
Ecosystem of Tasik Chini	All level of community	Community, individual use.	Natural capital consist of what being available here, and resources include lake, forest, home and place to freely play. Provide information with guided activities for public consultation
Lake Water bodies	Youth	Individual and community usage.	Lake ecosystem has high potential for ecotourism. However, the water quality and forest keep been threaten. Youth can't contribute in total due to lack of capital and channels.
Forests	Women	Community, households, individual.	Forest is important for forest products. Women contribute in making handicrafts.
Legends of the ecosystem	The community	Community, household, schools,	Forest and lake contributes to the legendry of Tasik Chini. Believed in local legends.

Compared to the other protected area, Tasik Chini as a biosphere reserve provides avenue to local community to have access of utilising the resources. The community was aware that visitors were not allowed to fishing and this regulation help them to guarantee the protein resources within the vicinity of their livelihood. In fact, the local practices in fish harvesting is sustainable as only a small quantity was consumed in their daily intake. Apart from the positive views, the locals also expressed their concern of ecological depletion and threats. They could see the unplanned development, rapid land use change and unsustainable resource use jeopardising the rich biodiversity and ecosystem on which the community and ecotourism industry rely on.

This study also gauge the young or schoolchildren's views during the public consultation held in 2009. Taking a more positive views, the young recognised the natural environment as resources used freely to leisure, learning, community livelihood and social well being. Their skills in fishing as well as wandering in nature, swimming and bathing in small streams are the tradition they could savour locally. The youths' viewpoints stress upon the provision of the natural capitals in generating economic benefits and active human capital that utilised their exposure and knowledge in forest and lake without depriving them from modernity.

Assessing the Natural Capital from the Tourists' Perspectives:

Having a unique, pristine and rich in natural capital is a requisite for any ecotourism destination. Natural capital, thus, becomes the key attraction and foremost motivation to all eco-tourists. Vice versa, its deterioration will upset the tourists' experiences and satisfaction. From the tourist survey done in 2010, the findings demonstrate on the emerging of tourists' preferences and behaviours, shown in Table 3.

First, were the individuals or group of eco-tourists who travelled to Tasik Chini, using either a tour agency or on their own initiative. These types of tourists - individuals or groups spend several days in the aboriginal villages, stayed in the eco-lodge and engage in ecotourism package, including eco-trails managed by the local operators. Secondly, were the planned eco-tourists, whose visits were organised by the research centre, particularly the Tasik Chini Biosphere Reserve. Their activities concentrate on educational and research purposes.

Nevertheless, the tourists were also concerned on the biodiversity of Tasik Chini ecosystem. Also apparent, the serenity and authenticity of the lake is disappearing, their comments touch on the murky water, loss of lotus as natural flora and fauna and eroding cultural use of the natural capital – forest, water, fish and forest products and natural landscape of the aboriginals. Meanwhile from tourist perspectives in table 3 indicate that the understanding of simplicity in travel is acceptable among those who visited Tasik Chini. The writing on their experiences acts as the word of mouth or promotional campaign to sustainable tourism experiences. In these

cases, minimal comments on lack of quality accommodations, food and tourist facilities are expected. Even though they had expressed a mixed of positive and negative tourism images as shown in Table 3, many tend to support conservation and restoration initiatives.

Table 3: Interdependent of Natural Capital and Comments from Tourists of Tasik Chini

Types of ecotourists		Inter-dependent to the natural capital as attraction	What Tourists seek and experience
Individual and group ecotourist		Lake and rivers, local ecosystem and local food	Lake experience, ecotourism, local livelihood
Knowledge ecotourist		Lake, forest within research station,	Knowledge experiences and real life experience, scientific expedition
Tourist category	Types	Sources	Implication for natural capital management
Individual or planned tourist by tourist operator	Mass tourist	Lonely Planet tourism	5 viewers giving rather unsatisfactory for their travel, natural assets been threaten, understanding of degrading quality of natural assets. Dam and river excursion, expression of concerned effort for sustainable practices, local chalet operator need to upgraded services, water quality – murky and scarce of lotus.
	Backpacker	Singaporean group, blog writer	Expected the simplicity of accommodation, unwind with the nature, sharing experiences and local practices, introducing the canoeing while fishing. Even the young girls were taught to seek local food.
Organised knowledge ecotourists	Students/young tourist	Locals, domestic	Conservation programme of biosphere reserve
	Youth tourist, mobility programme held annually	Locals, and internationals	Visits filled with programmes related to conservation.
Day trippers or stopover	Families, youth, locals of Pahang.	Locals of various origins, ethnics	'A place with better facilities now. A lake experience.

Another development taking place in Tasik Chini is the changing trend of tourist arrivals. Although the numbers of tourists were reported to decline in the early 2000, the existing data that we have collected in 2009-2011 has shown a new trend of tourist arrivals. The results indicate that Tasik Chini is moving forward to capturing new types of tourists, the SAVE tourist, comprising the scientist, academia, volunteers and educational tourists.

Assessing the Natural Capital from Tourism Providers' Perspectives:

As a destination, Tasik Chini has a small number of tourism providers, yet, their concern of green and sustainable tourism experience is another essential ingredient for sustainability. As of 2011, there are several active tourism providers, including the small scale resort, chalet, tour operators, boatman and local souvenirs entrepreneurs. From the study, diverse opinions on the natural capital as determinant for sustainability of ecotourism are also evidence, and growing towards a better understanding. According to the our key respondents, even though they are of small scale operators, they are aware of the need to enhance their knowledge on the current best practices and concern of sustainable practices, yet due to limited capital, trainings and informations were hardly accessible to all of them.

From the tour operators feedbacks, findings depict on a declining environmental asset as the reason Tasik Chini is losing its charm to tourists. Lotus flowers, the main showcase of Tasik Chini have been declining significantly since late 1990s. Meanwhile hesitation from the tour agencies serving a wider market at the national and major attraction at state level to include Tasik Chini in the tourist itineraries is attributed to the environmental degradation affecting the natural beauty of Tasik Chini. Also observed, regular grouses from tourists indicating environmental attractiveness of Tasik Chini did not match advertised descriptions.

Compared to the findings on gender differences in viewing the natural capitals, whereby women often became a better safeguarding compared to men, results pertaining this issue in the study area show a more balance responsibility of both gender on managing the natural capital. The men of the Tasik Chini who are involved in ecotourism also played dominant roles in safeguarding the natural capital. Above all, the aboriginals even though still practise animism, believed that with equal roles between man and women in helping them making their livelihood more stable and connected to the surrounding ecosystem. In ecotourism, provide work specialisation between man and women. In fact, among the tourism providers, their shallow understanding of natural resources is also changing. While they often look natural capital as input or resources during the early involvement in ecotourism, currently they are aware of value chain of natural capital. The ecosystem of the lake not only referred to direct usage in term of providing the lake attraction, but, the ecosystem also provides

services and inputs to be utilised in handicraft production and also as the augmented products especially in making the existence of its lake attraction.

Assessing Natural Capitals from the Scientific Community's Perspectives:

Being a biosphere reserve, educational function is essential, as it intends to provide a learning model that other biosphere reserve can also learn and pursue. Therefore, scientific exploration, education and research are the key components need to be showcased in Tasik Chini. The data we had collected confirm on the scientific perspectives of the natural capital. The area had received attentions from the scientific communities. While in the 1970s, the expedition explored on the properties of the lake and virgin forest, in the 1980s, the scientific based program was more organised and the results were established to the society. Of current progress, the scientific community play more rigorous roles. Since 2004, findings help to establish ecosystem of flora and fauna as well as the community. A research centre was established, responsible to handling research, education and trainings. More pertinent, in Tasik Chini, scientific programmes had been commenced since in the early years of 1980s and these initiatives were intensified in the 2000 until today. Interestingly the natural capital explored by the pure scientist is concentrated in the selective components of water bodies or lake and rivers, flora and fauna, hydrological issues, there is a rising concern of the need for an integrated approach in research in social sciences, especially in ecotourism, social cultural interpretation of the aboriginal and the tourist behaviour. Added to this is the rising of the architecture and engineering of the river slopes studies undertaken by members of the research centre.

From the results of the four perspectives of the stakeholders, the understanding of natural capital has now gaining its popularity, and therefore pursuance of an integrated research is crucial. During the introduction of ecotourism in the early 80s, it has exhibited with a steady influx of tourists, both locals and internationals. Nevertheless, as the quality of the natural attractions started to reduce due to improper development and forest clearing, the number of tourist arrivals also showed a drastic reduction, especially in the late 90s. Based on the articulation of different entities in Tasik Chini, hidden natural capital should be utilised into meaningful and sustainable natural capital. This include i) Hidden and unexplored natural capital --- stories of the each lauts. ii) Flora and fauna – easily access and possess within their surrounding – example pandanus can be used for spas, iii) Cambomba threat for lotus can be used for friendly environmental paper production.

Conclusion:

The study asserts on the growing importance of the natural capital from various perspectives when ecotourism became the central sector for mutual benefits and goals. The findings show in whatever form, level and complex the natural capital be, there is a pressing need to establish a more balance perspectives on input, process and outcomes in managing the natural capital. As for the community, the natural capital needs to be acknowledged as the traditional knowledge and heritage of the locals. The more representative the natural capital been assessed and understood, the better the chances on getting the consensus of conserving the natural capitals. As for the guests of the natural capital, the tourists in particular, the better they are aware on the good ecotourism practices, the more responsible they are when visiting the area. Moreover with the aims of targeting the knowledge ecotourists, Tasik Chini will therefore help reduce of improper uses of resources and surrounding habitats. Another important factor in determining the sustainability of ecotourism is the scientific community. A growing interest in exploring issues, challenges and potentials from the scientific community is indeed in tandem with its BR status that support research, learning and knowledge transfer to the locals. The study however is aware of its limitation in providing the assessment in a quantitative approach leaving the gap to be pursued in more comprehensive approach and therefore help build the data bank of the natural capitals of the biosphere reserve.

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