Desirable Ecotourism Plan for Pulau Ubin in Singapore, towards sustainable development to support Singapore tourism industry

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Abstract: Introduction. Over the past 20 years Singapore people’s awareness to the heritage and ecological conservation issues had become more intensive. The people had understood what they should left for the next generation just the biodiversity conservation, so it was a good idea to conserve it from now on. Then on 20th of December 2001 the Ministry of National Development had decided to defer the land reclamation works at Pulau Ubin and had retained the rustic island as the nature state. The promoting Pulau Ubin for ecotourism afterwards was the most important step. Some works must be planned in order to succeed the ecotourism, promoting conservation areas as well as of supporting the local communities. Objective. To discuss about desirable ecotourism plan for Pulau Ubin in Singapore. Methods. The research methodology was explorative descriptive qualitative. Data collection methods had used interviewing technique with purposive sampling, observation technique and documentation on various secondary data related. Results. Singapore had some natural resources in Pulau Ubin among others large granite crops, the diversity of habitats on the island which is from sandy and rocky shores to mudflats, from mangrove swamps to ponds. The older regenerated mangroves stand on pulau Ketam while the largest areas spread around Sungei Besar and Sungei Batu Kekek. There is a close relationship between local communities and their rustic island as well as with the wildlife. The first Malay inhabitants being mostly fisherman, lived right on the coasts while the first Chinese inhabitants being mostly quarry workers and shop keepers, lived further inland. Many plans had been arranged in which can be used as an input in order to arrange an ecotourism plan in Pulau Ubin.

Keywords: Ecotourism, Pulau Ubin, promoting ecological conservation, sustainable development

1. Introduction

There were the urgent matters that had been brought by some interested individuals together with some experts from the National Institute of Education and the Raffles Museum of Biodiversity Research to the government of Singapore. The government would realize the reclamation plan
intention for Pulau Ubin as stated in The Concept Plan 2001. On 20th of December 2001 the Ministry of National Development (MND) had decided to defer the land reclamation works at Pulau Ubin and had retained the rustic island as the nature state. They thought it was not cost-effective to reclaim a very small area and had decided not to proceed with reclamation works at Pulau Ubin as long as the island was not required for development. The promoting Pulau Ubin for ecotourism afterwards was the most important plan in which should had been done if Singapore didn’t want tourists threaten the natural preservation in Pulau Ubin. [17], [20], [21]. Some ideas must be planned in order to succeed the tourism. The plans could be doing together with host communities, stakeholders for building amenities and public relations as well as Institution for conserving flora and fauna in Pulau Ubin. These works would support the realization of ecotourism plan for Pulau Ubin. Objective. This paper discusses about an illustration to promote Pulau Ubin for ecotourism, concisely stated the existing ecological areas and other potential facilities linkages inside Pulau Ubin. This paper also stated a sustainable management’s plan support for ecological and community conservation based sustainable tourism on the island.

2. Methodology
The research methodology was explorative descriptive qualitative. Data collection methods used to make a deep interview with several people in Pulau Ubin and surroundings as samples, which collected in a purposive sampling technique. Observation on the sites and documentation had already done on various primary and secondary data related.

3. Result And Discussion
3.1 Features inside Pulau Ubin boundaries.
3.1.1 Natural Resources of Pulau Ubin
Pulau Ubin is an island off the northeastern coast of Singapore in which has a 1019 hectares land area, with shaped like a boomerang with the greatest length about 8 km and the breadth varies from 1.3 to 1.7 km. The island is hilly at western and eastern but low-lying in central region, with Pulau Ketam and Pulau Sekudu in its south. A forest canopy is spreading out from the western hills of Bukit Tajam and Bukit Tinggi while the east and southeast are sandy beaches with mangrove line river mouths and tidal inlets. Basically Pulau Ubin is a large granite crop with a maximum height of 75 m (Puaka Hill), because of the rich of granite resources people had been called Pulau Ubin as the “Stone Mountain. It’s since the middle of the last century granite mining has supported settlers and local industries, there are many abandoned granite quarries filled up with water [12].

The wide diversity of habitats on the island ranging from sandy and rocky shores to mudflats, from mangrove swamps to ponds, while in the coastline there are full of fishes, prawns, crabs in the mangrove plants. Away from the area there are the secondary forests in which interspaced with rubber and coconut plantation and abandoned orchard gardens with local fruit such as durian, rambutan, duku, chiku and chempedak. Some species of birds and insects live among particular fruit trees and plants like pink-necked pigeons, bulbul birds especially when Banyan tree is in fruit. Another shore birds are House Swifts, residence Pacific Swallow, visiting Bam Swallow, Brahmini Kites and White-belled Sea Eagles feed on fish while Collared Kingfisher often perching on the branches of mangroves [9]. The older regenerated mangrove stand on Pulau Ketam and its northern part, while the largest areas about 195 hectares spread around Sungei Besar and Sungei Batu Kekek. There are many varieties of mangrove plants in the island which are important for fishes, prawns, mulluscas, mudskipper like Avicennia, Brugueira and Rhizophora. In Bukit Tinggi and Bukit tajam which located in the western part of Pulau Ubin birdwatcher will see endangered Red Jungle Fowls and Hill Myna here. While in the south-eastern part of Pulau Ubin there are Nipah palm forests, a coastal wetland habitat that almost extinct from Singapore where the monkey Long-tailed Macaques, Macaca fasicularis live there. On the other hand some animal under the threat because of diminishing food sources such as nocturnal mammals Wild pigs, bats and flying foxes. Another parts are under the threat of poachers like Sun lizard and crested lizard, Malayan water monitor and flying lizard.
Some birds living in the ponds such as migratory Pacific Golden Plover, Mongolian Plover roosting sites during high tide, while during ebb tides these birds joined by white little Egret, Egretta garzetta, Pacific Reef-Egret, Egretta Sacra, the buffy fish owl, Kelupa Klupu is an endangered bird that feeds at prawn ponds and rivers at night, which only three known pairs of this owl in Singapore and two in Pulau Ubin. Tanjung Chek Jawa, a place with one square km in size located at the eastern tip of Pulau Ubin, is a natural beach with marine wildlife. There is a collection of six distinct habitats – coastal forest, mangrove, sandy beach, sand and mudflats, coral rubble and an island called pulau Sekudru or frog island. A recent survey of the area turned out rare coastal flora such as Seashore nutmeg and seashore mangosteen which thought to be extinct – grow on the sandy beach, found many species of sea grass and seaweed. Fauna found in Tanjung Chek Jawa are Stick insects, Flying Dragons, Oriental pied Hornbills, Seahorses, Sea Anemones, Stingrays, Horseshoe Crabs, Starfishes, etc. In order to ensure that Tanjung Chek Jawa remains sustainable for long-term enjoyment, visitor must book on a first come-first-served before visiting and only possible at low tides, should wear proper footwear, should not litter, touch nor collect any plant nor animal specimens, in order to prevent further deterioration of mudflats and destruct marine organism [16], [22].

3.1.2 Visitation Information
Some years ago when people were surfeited with block and sky-scrapper building they were looking for the rustic places with tranquillity. When they heard government had put on Pulau Ubin in reclamation for military purpose as stated in The Concept Plan 2001, people start to flocking Pulau Ubin when every weekend they - locals or foreigners - have been visiting, camping in Pulau Ubin or Tanjung chek Jawa to enjoy the last tranquillity and biodiversity that very rare in Singapore. As then government had decided to put off the land reclamation works at Pulau Ubin and Tanjung Chek Jawa and will be conserved for as long as possible, people no longer to rush to see the natural preservation. More than 300,000 people visit Pulau Ubin per year, made it one of the most destination places in Singapore [22].

3.1.3 Infrastructures inside pulau Ubin
The rustic offshore island had had trails, tarmac roads, shelters, camping grounds, public toilets, public phone, generator equipment for electricity, community centre and information kiosk, to contribute to the environmental education for visitors there are many interpretative signs along the trails that explain flora, fauna and some interesting areas. Those facilities managed and administered by National parks (N-parks). Chalets and lodges owned by private sectors in the southern part of the island. There is also the latest first adventures in other side of the island. Some people can sail across the waterway to enjoy the attraction and adventure in Ubin Lagoon Resort, which have some popular activities among the visitors such as irdwatching, camping, canoeing, cycling, angling, trekking the nature walk, sight-seeing of granite quarries, rock climbing. The other interest places are Ma chor temples, Kampung melayu, Noordin and Maman beach [18]. There is Nparks information Kiosk at the Basketball court opposite Ubin Community centre at Ubin village that prepared internet, some brochures and leaflets for visitors. Transportation to Pulau Ubin started in southern part from change Point Jetty in Changi village with a 10-minute boat ride run by boatman from the village, followed by taxis or bicycle that can be rented from bicycles rental kiosk. While to reach Ubin Lagoon Resort from Punggol Marina Ferry Point in southwest part need 15-minute boat ride. There are many roadside stalls along the trail where people can buy some fresh coconut, durian, rambutan, cold water or need coffee shop and seafood restaurant that have been run by village people.

3.1.4 Personnels in Pulau Ubin
In Pulau Ubin there is a few personnel who work as a park ranger to answer questions from some visitor or when they found a little lost and need some directions. If the level of visitation growing higher especially on the weekend and holiday, it’s urgent to recruit rangers and tour guides to avoid a lost direction of the visitors. Threats:

a). Many abandoned granite quarries filled up with water, if the government did not notice, some tropical diseases which is source on the standstill water can threaten the health of the communities.
b). Because of diminishing food sources, some nocturnal mammals: wild pigs, bats, flying foxes are under the threat, danger of poachers are sun lizard, crested lizard, Malayan water monitor and flying lizard.

c). Some endangered birds: white little Egret, *Egretta garzetta*, Pacific Reef-Egret, *Egretta Sacra* and the buffy fish owl *Kelupa Klupu* (known 3 pairs in Singapore and 2 in Pulau Ubin).

d). Rare coastal flora; Seashore nutmeg and seashore mangosteen (thought to be extinct) grow on sandy beach, found many species of sea grass and seaweed

3.2 Bridges outside Pulau Ubin Boundaries

3.2.1 Interaction between Pulau Ubin and its local communities

There is a close relationship between local communities and their rustic island as well as with the wildlife. The first Malay inhabitants being mostly fisherman, lived right on the coasts while the first Chinese inhabitants being mostly quarry workers and shop keepers, lived further inland. In between works they set about to plants crops, fruits and vegetables farming. After harvesting they sold the crops to Changi Point in a half an hour by rowing the boats, while on the back to return to Ubin the boats would be full of goods to sell again in the Ubin shop. At the present the population of Pulau Ubin is about 100-150 residents, they live in the sleepy village, the life rely on weekend visitors, rent out the bycicle or canoe, sell food, drink or fruits as well as drive people around the island with an old taxi. The Straits Times stated that for 10 years some inhabitants in the island had seen their friends resettled as government took back the land, and the government expected the same to happen to them. Some people reluctant to go because they had born and had a big family there, at the old age it will be hard to adjust a life in such an apartment. Because they do not have the proper work and just rely on to nature resources they did not know how long they can survive the life. The people in Pulau Ubin difficult to be separated from their life’s environment as both need one another and dependent mutually [12]. After the Urban Redevelopment Authority revealed about preservation of the island as long as it is not needed for development, there are some costs and benefits for inhabitants. Competitions among inhabitants in order to offer services for tourists sometimes gave frictions between them as a consequence. The fragile environment in Tanjung Chek Jawa had been threatened if not treated it carefully. The natural resources in Pulau Ubin is a valuable inheritance for the young generation, an outdoors classroom for them to learn how the nature’s cycles has been going on.

3.2.2 Regional Attractions

At the southern part of Pulau Ubin there is a place name Changi Village where the Changi Point jetty had been located, historically it is an enclave for British armed forces and their families. Changi was a lush green area with barracks and playing fields. The coast lined with coconut trees was a lively playgrounds for pleasure seekers for a day by the sand and sea. At the present day Changi village has a cosmopolitan mix of shops and eateries with a lush green surroundings, some seaside budget hotels built where visitors can stay for a while before they run out to Pulau Ubin. In the western part of Pulau Ubin there is a place called Punggol Point, is a paradise for sea sports and recreation. Once is a fishing village, Punggol Point is set in the peaceful surroundings of residential homes, holiday camps, beaches also a marina and a jetty. Off the coast lies Coney Island (Serangoon Island), a little-known treasure trove of a beautiful sandy beaches and tall casuarina trees. This island is a heaven for die-hard anglers to compete their angling skills in every Singapore’s fishing competition.

3.2.3 A National perspective

Pulau Ubin will remain as avenue for sports and recreation activity centre to complement the existing National Police Cadet Corps campsites and the Outward Bound School in Pulau Ubin. But on the Ministry of National Development (MND)’s press release in 14th of January 2002, it reveal that the rustic nature of Pulau Ubin will be preserved for as long as possible. The long-term’s planning intention for Pulau ubin had stated in the Concept Plan 2001. The MND had decided to put off the land reclamation works at Pulau Ubin. This happened after a team of experts from national Institute of Education, Raffles Museum of Biodiversity research and other interested individuals submitted a report to ensure the survival of the marine ecosystem at Tanjung Chek Jawa [18]. Threats:

1). It urgent to recruit rangers and tour guides to avoid a lost direction of the visitor.
2). After authority revealed about preservation of the island, competitions among inhabitants in order to offer services for tourists sometimes gave frictions between them as a consequence.

3). As a result of the matter above, with tourists flocked to the island the fragile environment in Tanjung Chek Jawa had been threatened if not treated it carefully.

### 3.3 Desirable Ecotourism Plan for Pulau Ubin

The definition of ecotourism is: “Ecotourism is ecologically sustainable tourism with a primary focus on the experience natural areas that fosters environmental and cultural understanding, appreciation conservation.” [24].

To create an ecotourism or sustainable tourism in Pulau Ubin Singapore, the challenge is to learn from the past of the island and then initiate a holistic approach based on the principles and best practises of sustainable tourism within an organizational framework founded in partnership among National Parks Board, community of Pulau Ubin, Singapore Tourism Board, Ministry of the Environment, Ministry of National Development, Tourism industry and the conservation community. The principles of sustainable tourism (proposed by World Tourism Organization, 1998): Sustainable tourism “envisioned as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support system”

The decision making in ecotourism must consult and acceptable for inhabitants, beneficial to stakeholders, should be based on ecological principles, be sensitive to local cultural and religious traditions and should not exceed the environmental carrying capacity or not endanger environment, ecosystem and local community [8].

The basic principles of ecotourism are:
1). Minimal negative impact on the environment and local community living in it [3]
2). Educate the visitor on the culture and heritage of the destination [4]
3). Provides benefits (e.g. financial) for the conservation of the environment and empowerment of the locals [3]
4). Includes the local community in the development and operation of the destination [5]

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### 3.3.1 Features inside Pulau Ubin Boundaries

**a). Pulau Ubin’s Natural Resources**

After the government had put off land reclamation at Pulau Ubin, they also allow the marine life at Chek Jawa to be retained and preserved in its natural state for as long as possible. It’s our responsible as a human being to sustain the rest of Singapore’s natural heritage from losses in biodiversity. The deferment of cleared forest and reclamation land had avoided from suffered reductions in diversity. It’s a big chance for young generation and tourists to appreciate the natural conservation and marine life that rare in Singapore.

i). The involvement of Nature Society, National Parks and Raffles Museum of Biodiversity Research had been needed to monitor the ecological impacts of tourism in Pulau Ubin and surroundings such as
catch the poachers or hunters, damages of shorelines and uses of an existing camp site. They also had to find out some areas that are most threatened by tourism and require urgent attentions. The National Research of Education also conducts inventories some species of wildlife and ecosystem in which have not been intensively studied.

ii). The stakeholders also responsible for conservation of second forests, mangrove plants and some orchard plantations because these natures are the habitats of wildlife around Pulau Ubin and tourists’ destination for birdwatcher and natural trekking.

iii). No clearing lands or even a small development because it will disturb food cycles of wildlife and endanger some of species, no emerging on the existing buildings and camp facilities, disallowed camping in the forest and canoeing in the sensitive mangroves.

b). Visitation information
The tourism industry responsible for the selected tour operators which held the tour packages in a day trip along the trails to appreciate the natural habitats, insects and bird species without damaging the environment. The group should not more than 20 people and disallowed plucking the plants or catching any animal in the forests.

i). To avoid crowded and shattered the habitat’s wildlife, Nparks must continue the procedures for visiting Chek Jawa and could be applied in Pulau Ubin areas especially in holiday and weekend in a limited visit.

ii). Coordination with ministry of education has been needed to establish the environmentally awareness campsites in the cleared area, and activate the learning education for students about ecological environment and nature reserves conduct by the experienced tour guide.

iii). Tourism activities in Sungei Besar area such as canoeing and power jetting should be transferred to Coney island to prevent further deterioration on mangroves plants along the river.

iv). Every year National Parks Board should establish visitors statistics record system to give a demographic information features, as well as the visitor surveys to get information of marketing demands in order to improve the tourism situation in Pulau Ubin.

v). Nightlife visitation is one of many possibility attractions in pulau Ubin. The aim of this visitation is to learn more about the life of nocturnal wildlife in this island, visitors must walk along the trail to enjoy the nature attraction.

c). Infrastructures inside Pulau Ubin
The ecotourism strategy plan should include some activities with infrastructure facilities in Pulau Ubin, as follow:

i). Some signboards might be erected to show the detail of different species of plants and certain ecologically sensitive areas such as quarries, rivers, mangroves, hills and also hardening the sidewalks of the trails to reduce damage from visitors.

ii). A health service clinic should be needed in Pulau Ubin for emergency treatments for visitors and especially for elder inhabitants so they do not need to go to mainland seeking for treatment.

iii). A museum should be established near the visitor’s centre to showcase some species in which had almost endangered and extinct particularly in Pulau Ubin and the surroundings, so before visiting the island the explanation had already conducted them to the areas.

iv). National Parks Board and private sectors can renovate the existing Chinese villages and Malay kampong house, and the owners can rent the house as lodges to the visitors with traditional lifestyle including home-cooked foods and beverages.

v). In line with development of tourism in the island, pollution is becoming a threatened problem if there is an improper disposal sewage. Land and water is the sensitive areas where pollution can be occurred. Installation of dustbins and signboards, education the public and campaign about pollution in Pulau Ubin and regular activities through the island can control the pollution.

vi). Tourism industry and coordination with local communities can develop the art handicraft centre to encourage income for the local people.

d). Human Resources available in Pulau Ubin
i). The island needs some eco-tour guides and tour operators who qualified in guide’s skills, knowledge, attitude and actions particularly in terms of guiding Pulau Ubin tourism. The eco-tour guides must be certified by The Eco Guide Program Industry that accredits nature tourism and
ecotourism product, while tour operators gain a simple method of recognizing quality guides. These guides and tour operators can be recruited from the younger villagers who works in the mainland as the priority and send them in the training program.

ii). National Parks Board should make a training to select guards and rangers for the visitor services and to monitor ecological impact of tourism. The recruitment should give the priority to the village people that have more experiences of situation surrounding island. The village people also can be hired as drivers who will bring along the visitors around the island.

iii). Potential pulau Ubin managers should employ staff with appropriate training and qualification. In order to encourage more experiences they can send personnel to formal ecotourism training program and to send them to other countries like Indonesia which had more experiences and in which they had more experiences in ecotourism.

3.3.2 Bridges outside Pulau Ubin Boundaries

a). Interaction between Pulau Ubin and its communities

From the late 1960s to 1980s the younger generation of pulau Ubin had moved to mainland seeking for the job as this is an unstoppable trend. The rest of the people in the island are elder people which not enough to support sustainable development. Fortunately some of the village people who had ordered from government moved to the mainland for reclamation had decided to move back to pulau Ubin continue to find a living in the island as a kelong farmer or engine driver. The island’s inhabitants who still live on the mainland and found out the difficulty of life in the big city has been encouraged to move back to the island. Interrelatedness between Pulau Ubin and the inhabitants is easier to facilitate their life. They can open kampong house lodges and rent them including their daily lifestyle, some seafood restaurants with rustic scenery, or even work as rangers or drivers. Cooperation among inhabitants and the authorities can avoid some frictions, the people can run the business professionally and peacefully. Important to choose some wise persons as the representatives of the island and once to be honoured as headmen of Pulau ubin, so everyone can refers all the problems to them and discuss together peacefully. These representatives should communicate with the government authority about tourism’s impact that affected the socio-culture of island people.

b). Regional Infrastructures

To build a support to the pulau Ubin’s proposed ecotourism plan, important to decide some infrastructures which had to be established together with the government (e.g URA) or private sectors, such as an improvement of Changi point and Pulau Ubin Jetty, health clinics, lodges with one condition that the developments will not leave the main point which is no destruction and deterioration on ecological environment in Pulau Ubin.

c). Regional Attractions

i). Based on the variety of biodiversity in Pulau Ubin, the potential attraction for ecotourism plan gave a chance for tourists to learn how to tap rubber in rubber plantation, living in traditional fishing “kelong” or learn how the quarry’s worker had done their jobs in the past years. All these activities are interesting and more experiences which never found in mainland of Singapore.

ii). Traditional Chinese kankar village and Malay kampong house with fish, chicken and duck farms in the backyard should be kept carefully because this rare lifestyle in Singapore will become the destination of the visitors.

iii). Pulau Ubin is a part of rustic coast the Parks & Waterbodies Plan and Identity Plan, proposals of up to 2015 which had already done. The Parks & waterbodies Plan, to enhance The Green Spaces, Waterbodies and Living environment and the Identity Plan to recognize, retain and enhance identity and built heritage (a MND Statutory Board).

iv). The rustic coast which is connect four coastal areas consist of Punggol Point and Coney island (the paradise for sea sports and recreation), Pasir Ris Park (the family getaway), Pulau Ubin the nature retreat and Changi village the seaside village and getaway place to Pulau Ubin. The north-east coast of Singapore coastal areas had been planned to link one coast to another coastal areas with river taxi service so tourists can enjoy a coast to coast journey or together a whole as a unique outdoor retreat.
d). A National Perspective
In order to protect the ecological wildlife and marine life in pulau ubin, National Parks Board had to set up a committee comprising representatives from national Society, Raffles Museum of Biodiversity Research and other experts who connect with the same concerns to work together a comprehensive plan to maintain the rustic Pulau Ubin for the next future. The representatives should decide the entrance fee system to prevent destruction from tourists in which can threaten the environment. If tourism is a national priority so the representatives must arrange the budget for nature conservation in Pulau Ubin and surrounding and propose to the government, so the government can allocate the budget for the plan.

e). Interaction between various levels and private sectors
Professional interaction among the stakeholders in pulau Ubin had been needed to carry out the ecotourism plan in Pulau Ubin. The coordination consist of:

i). Training for the tour guides and promoting the nature reserves. Under the professionalism they can recruit the village people to be the tour guide and promoting the flora and fauna of Pulau Ubin to the tourist. On the other hand promotion in outside the country must be very incessant because the neighbouring countries such as Indonesia, Malaysia, Thailand and Australia had much more experiences in ecotourism, therefore the tourists had more choices to decide the destination.

ii). Sending the managerial staffs of Pulau ubin in regular training of ecotourism and applied the results in nature reserves.

iii). All the cooperation with private sectors should not leave the basic principles of natures’ conservation, keep the development of pulau Ubin to a minimum to avoid many destruction in Pulau Ubin.

4. Conclusion
1. As the Ministry of National development (MND) had decided to put off the land reclamation work at Pulau Ubin and the surroundings for as long as the island is not required for development, the island is becoming more interested in Singapore. The National Parks Board should be prepared for sustainable development for ecotourism to get involved with ecotourism and keep the costs and benefits in balance.

2. The assessment of the current facilities inside pulau Ubin has been done in order to give the input to support the ecotourism in the island as well as the features of desirable ecotourism plan for pulau Ubin. The assessment has just an opinion to give input for the planning process. The whole developing process of an ecotourism strategy in Pulau Ubin will be done by certain representatives.

3. The best practises in this ecotourism plan is adequate budget and finance to run off the process, cooperation among the government, nature conservationist, research’s education, tourism industry and other private sectors had been needed to recognize the importance of ecotourism plan in Singapore in order to support sustainable development.

4. The natural resources in Pulau Ubin is a valuable inheritance for the young generation, an outdoors classroom for them to learn how the nature’s cycles has been going on.

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