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# Natural Heritage of Environmentally Sensitive Areas in Kuala Selangor District, Malaysia

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**Abstract.** This paper addresses the issue of the conserving the natural heritage of environmentally sensitive areas in Kuala Selangor District, Malaysia. Being as environmental goods, the existence of these natural heritage elements is all important as overall it enhances the quality of life. Simultaneously, it is greatly marked that presently there is an increasing tendency in the development which may hamper these sensitive areas. Thus, this research was embarked to analyses the importance of areas of natural heritage found in Kuala Selangor. The research mainly employed the collection of secondary information in terms of textual and statistical information in the form of GIS format to assemble info for analysis purpose. The results indicate that the natural heritage of environmentally sensitive areas comprises of Kuala Selangor Nature Park, Kampung Kuantan, Kampung Bukit Belimbing and Permanent Forest Reserves. These fields hold the prominent values of historical archaeology and biodiversity which should be protected for future generations. As a conclusion, it is clearly evident that environmental goods, letting in natural heritage have invaluable assets that hold its own contribution to raising the overall environmental quality.

**Keywords:** environmental goods, natural heritage, environmentally sensitive areas, Kuala Selangor.

## 1. Introduction

The integration of environmentally sensitive areas (ESAs) into the spatial planning by coherent environmental goods system has received increasing attention by many stakeholders in Malaysia in the last decades. The inclusion of the discussion of such areas which are highly considered as invaluable environmental goods in the local planning system. An assessment of such ESAs addressed in the environmental chapter of the Local Plan (LP) is all important as it gives guidance for future planning in terms of environmental planning for any particular districts [1], [2]. In this regards, the district of Kuala Selangor was selected as the subject area to show the existence of ESAs with a specific citation to the aspect of natural heritage, reflecting the richness of its biological diversity. Apart from natural heritage, the other types of ESAs are disaster risks and life support. However, this report will only address about the natural heritage of ESAs in Kuala Selangor district. By and large, the district has a diverse ecology of permanent reserve forest, rivers, coasts and many more. With that respect, this study has identified several ESAs for Kuala Selangor.

Environmentally Sensitive Areas (ESAs) are defined as landscape elements or places which are vital to the long-term maintenance of biological diversity, soil, water, or other natural processes, both on site and in a regional context [3]. ESAs occur within all landscapes but are relative to surrounding land uses. It has become the hope of the government to protect and preserve these fragile areas from any development depending on its level of sensitivity. Meanwhile, according to the Manual of Standards and Guidelines provided by the Town and Country Planning Department, Federal Malaysia, the definition of Environmentally Sensitive Areas (ESA) is a "special area that is very sensitive to any activity or

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development and need to be preserved for its heritage value, preserve life and minimize support disaster risk due to land use changes" [4].

Thus, it is crucial to identify and analysis the availability of ESAs in this district, as it faces the pressure of development due to its locality that is within the Klang Valley which has become the most prominent areas for development.

## 2. The Study Area: District of Kuala Selangor

The district of Kuala Selangor consists of nine mukim with the total area of 119,000 hectares (Fig. 1). It is located at the north of the state of Selangor which is the most developed state in Malaysia. It is bordered by the district of Sabak Bernam on the northern side, districts of Hulu Selangor and Gombak on the eastern side, districts of the Klang and Petaling on the southern side and Straits of Malacca on the western side. The natural drainage system in Kuala Selangor district comprises of the river basins of Tengi River, Bernam River, Buluh River and Selangor River. Agricultural activity is the dominant land use, covering an area of 59,065 hectares (49.3%) of the total district area. It has a total of 205,257 populations in 2010 with its growth rate of 2.45% annually. Generally, the town of Bestari Jaya and Kuala Selangor are considered as the sub-regional centres in the state of Selangor. This district has a very accessible road network with its neighbouring districts, whereby the Federal Route 5 passes through the district from the Klang District (south) going to Sabak Bernam District (north). The LATAR highway connects Ijok with Kuala Lumpur, reducing the time travel from this district to Kuala Lumpur that is located about 60 kilometres away.

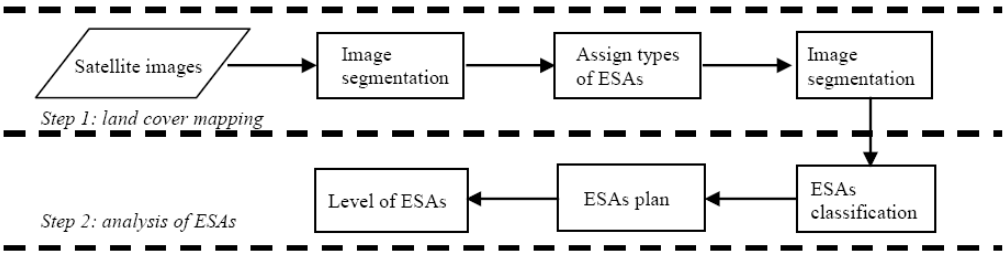


Fig. 1. The overall methodological framework for the study

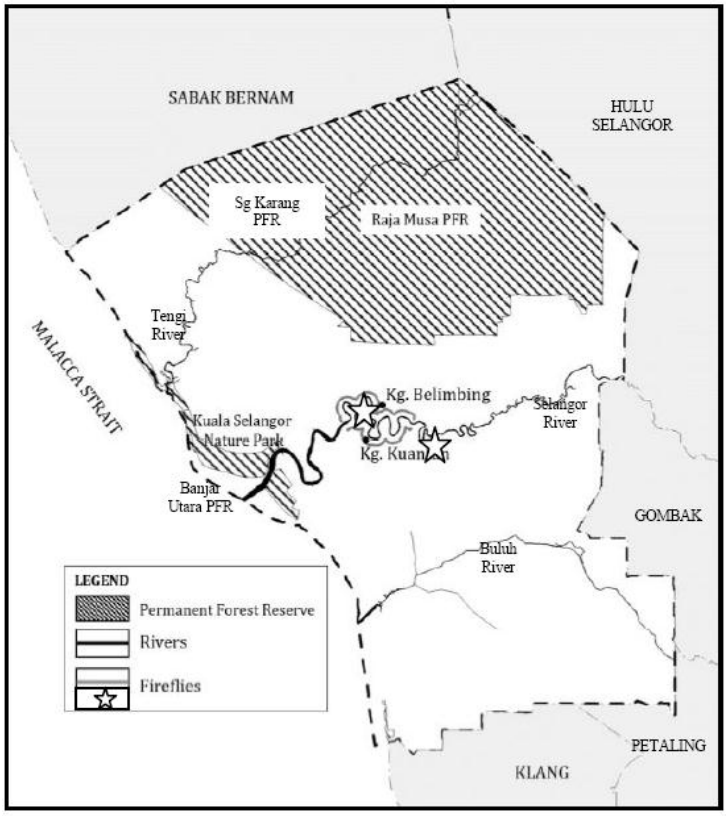


Fig. 2. Natural heritage of ESAs for Kuala Selangor district

## 3. Methodology

Based on the series of GIS data for respective environmental elements for Kuala Selangor, the information was layered to produce the ESAs plan indicating the types, locations and sizes of the identified natural heritage of ESAs. It is essential to integrate the ESAs into the overall land use spatial planning in order to conserve and preserve the Mother Nature for future generations as propagated in the notion of sustainable development. Thus, the government of the state of Selangor has its manual on ESAs, guiding the identification of ESAs for preservation purpose [4]. Basically, there are three types of ESAs, covering the natural heritage, disaster risks and life support with its specific areas of consideration and its level of sensitivity, either level one, two, three or non-ESAs [4]. Fig. 1 shows the methodological employed for the study, depending highly on the GIS spatial data of the selected ESAs aspects.

## 4. Results and Discussion: Natural Heritage of ESAs in Kuala Selangor

The GIS data were obtained, generated and analysed the information on the natural heritage of ESAs in Kuala Selangor district. The results demonstrate that the specific areas involved: the permanent forest reserves (PFR), protected fireflies areas in Kampung Kuantan and Kampung Bukit Belimbing and Kuala Selangor Nature Park due to the availability and the richness of biological diversity. Fig. 2 is the results showing the natural heritage of ESAs for Kuala Selangor district.

### 4.1. Permanent forest reserves

Permanent Forest Reserves (PFR) are an important contributor or agent to the biological diversity, apart from its benefits to the economics and the environmental quality [5]. According to the Selangor Forestry Department (2010), there are two types of PFR in Kuala Selangor, namely mangrove and peat swamp forests. Selangor has 250,128.83 hectares as a total of PFR and 37 390.98 hectares (14.9%) from it situated at Kuala Selangor. Raja Musa PFR compartments are mainly covered with peat swamp which covers 23,486.43 hectares. Table 1 shows the information on PFR in Kuala Selangor district.

Table 1: PFR in Kuala Selangor District

| Name of PFR | Size (Ha.) | % |
|---|---|---|
| **Type of forest: Mangrove** | | |
| Banjar Utara PFR | 1,011.64 | 2.70 |
| Banjar Utara PFR (additional) | 226.04 | 0.60 |
| Kapar PFR (addition) (part of Klang district) | 124.38 | 0.33 |
| Sub-Total | 1,362.06 | 3.64 |
| **Type of Forest: Peat Swamp** | | |
| Raja Musa PFR | 23,486.43 | 52.13 |
| Sungai Karang PFR (part of Sabak Bernam district) | 12,542.49 | 44.22 |
| Sub-Total | 36,028.92 | 96.36 |
| **Grand Total** | **37,390.98** | **100** |

Source: Department of Forestry, Selangor, 2013

In addition, the study of the Central Forest Spine (CFS) had identified Bukit Raja Musa PFR and Bukit Gading-Tarek PFR as part of CFS2-Secondary Linkage 3. Mangrove forest in Kuala Selangor can be located at Banjar Utara FR and Kapar FR. The areas are overgrown with matured mangrove trees that can be found along the coastline which is important for coastal erosion mitigation besides essential for fish breeding areas.

Raja Musa FR is located at the north of Kuala Selangor district, which cover 23,486.43 hectares of land. It is merging with Sungai Karang PFR, located at the District of Sabak Bernam where Tengi River is passing through the forest reserves and act as a natural/physical boundary dividing the Raja Musa PFR and Sungai Karang PFR. Peat swamps land act as a natural sponge where it will absorb large amounts of water and it can reduce the flood problem. However, peat swamps also a fire prone area as it could keep the fire embers for a long period stored in a thick layer of humus. This Raja Musa FR area has experienced several times cases of the forest fire. Because of its nature in controlling flood and fire sensitive area, it makes Raja Musa PFR as reasonably placed for protecting from of any development.

## 4.2. Protected fireflies in Kampung Kuantan and Kampung Bukit Belimbing

From the upstream of Selangor River (East) toward the coastal area (West) is an important habitat for fireflies (spp. Preroptyx Tener) which became a key reason for ecological-based tourism especially in Kampung Kuantan and Kampung Bukit Belimbing. Pteroptyx Tener beetle is unique as it produces three rhythmic flickering light per second and they have been spotted as the early 1970s. These two areas have a similar habitat features which suitable for fireflies breeding area. The areas along the Selangor River between Kampung Bukit Belimbing until Kampung Kuantan are rich with berembang trees (Sonneratia Caseolaris) whose habitat to flickering fireflies. The estuary with a low level of salinity allows the berembang trees to grow healthy as a source of food and shelter. Freshwater flow from upstream of Sungai Selangor contributed to the balance of the salinity in the area downstream of the river. The level of salinity is an important ecological factor to form a habitat for fireflies. Berembang trees depending on the level of low salinity (less than 10%) is the main source for habitat requirements for fireflies. Similar to the colony is very sensitive to fireflies and very simple surroundings are influenced by the effects of pollution and habitat destruction activities.

This insect is very sensitive to any changes of physical, biological and chemical of its surroundings. Due to the uniqueness of this insect, these areas should receive a full protection from any possible threat. Under Selangor Water Management Enactment 1999, these area has been gazetted as Protection Zones (declared and restricted area) 2009, numbered 2171. It is intended to protect the river reserve (150 to 400 meters both sides of riverbanks), buffer zone and the surrounding environment of Selangor River.

## 4.3. Kuala Selangor Nature Park

Kuala Selangor Nature Park was gazetted as a public park covering 240 hectares which mainly fortified by secondary forests and muddy plains **[**6**]**. This area has been identified as an area of interest for birds or important bird areas (IBA) in Selangor (Fig. 3). It has been identified as an area interest of birds (Important Bird Areas) by the BirdLife International **[**7**]**. It is said that there is a total of 156 species of birds in which 57 of whom are immigrant's birds. This park has become a stopover for migratory birds that usually come from countries like Russia, Mongolia and Siberia. These birds normally migrating during the winter season at northern hemisphere to New Zealand and Australia.


Fig. 3. Kuala Selangor Nature Park is also recognised as an Important Bird Area (IBA)

The area is located at the mouth of the Selangor River where it is rich with mangrove tree species, such as Avicennia, Rhizophora and Bruguiera. Beautifully landscaped nature transformed into secondary forests when it is increasingly entering into terrestrial lands (landward) which occupied by long-tailed macaques (Macaca fascicularis) and silvered leaf monkeys (Trachypithecus aurata). Coastal birds such as milky storks (Mycteria cinerea) and egrets can also be easily set up here. In addition, many wildlife can be spotted at Kuala Selangor Nature Park, for instance, beaver (Lutra perspicillata), mudskipper and mud crab. It was recorded that there are more than 156 species of birds, including Nordman's Greenshank (Tringa guttifer) and Pitta megarhyncha. Healthy habitat is important for flora and fauna where it depends on river water quality factors. A ubiquitous mangrove tree also provides a balanced environment of flora and fauna ecosystem. As a result, it is crucial to protect this area which is full of heritage and rehabilitate from development that would threaten the stability of natural systems.

Table 2 shows the areas considered as a natural heritage of ESAs in Kuala Selangor district have the main priority of sensitivity. It holds the most important level of ESAs, Level 1 indicating that it requires full protection and very limited and minimum development is allowable with strict conditions.

Table 2: Level of ESAs for natural heritage

| Level of ESAs | Explanation | Management Guidelines |
|---|---|---|
| ESAs Level 1 | Full coverage area (no development allowed except for works that relate with the conservation and preservation; limited eco-tourism activities while research activities such as forestry aspect are permissible) | There are no development activities allowed, regardless it relates with municipal, agricultural or logging activities. Allowable activities are minimal impact activities such as eco-tourism, research and education activities, but there must be a study on‘Carrying capacity' to control the ecosystem of the ESAs. |

## 5. Conclusion

The employment of GIS data in collecting and running the analysis has produced the spatial mapping of the natural heritage of ESAs for Kuala Selangor district. This district has a wide range of natural resources and ecosystems that were categorised as ESAs. Its natural heritage of ESAs consists of Kuala Selangor Nature Park, Kampung Kuantan, Kampung Bukit Belimbing and Permanent Forest Reserves. Thus, the areas should be prudently conserved for the benefits of the future generations. It is evident that these fragile areas need the attention of the stakeholders in order to plan and manage these invaluable assets of the nation. The existence of these environmental goods should be protected as they bring many profits to the society as a whole, particularly in term of providing good environmental quality that is so crucial in the years to come. These ubiquitous natural resources and ecosystem are often getting pressure from development that involves a change in the forms of the physical, economic or social condition. A condition of win-win situation should be practiced in Kuala Selangor district with the intention of sustainable development.

## 6. Acknowledgements

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