

# Conservation of Living Pharmacies in Tasek Bera

## A Wetland of International Importance in Malaysia

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## **INTRODUCTION**

The indigenous Semelai people (current population 2,000) have lived for 600 years in Tasek Bera, a Ramsar site in Malaysia. For generations, they have used the diverse plants found in the jungle for an amazing range of medicines, prophylactics, intoxicants, beautifiers and aphrodisiacs.

This project will scientifically identify these plants and produce a comprehensive report on their medicinal uses with the help of the Semelai guides and community shaman as teachers of traditional medicine.

This project will benefit the Semelai by ensuring the preservation of their knowledge and has potential for further educational / research initiatives that could bring income generating opportunity.

### **Location of Tasek Bera – Project Site**

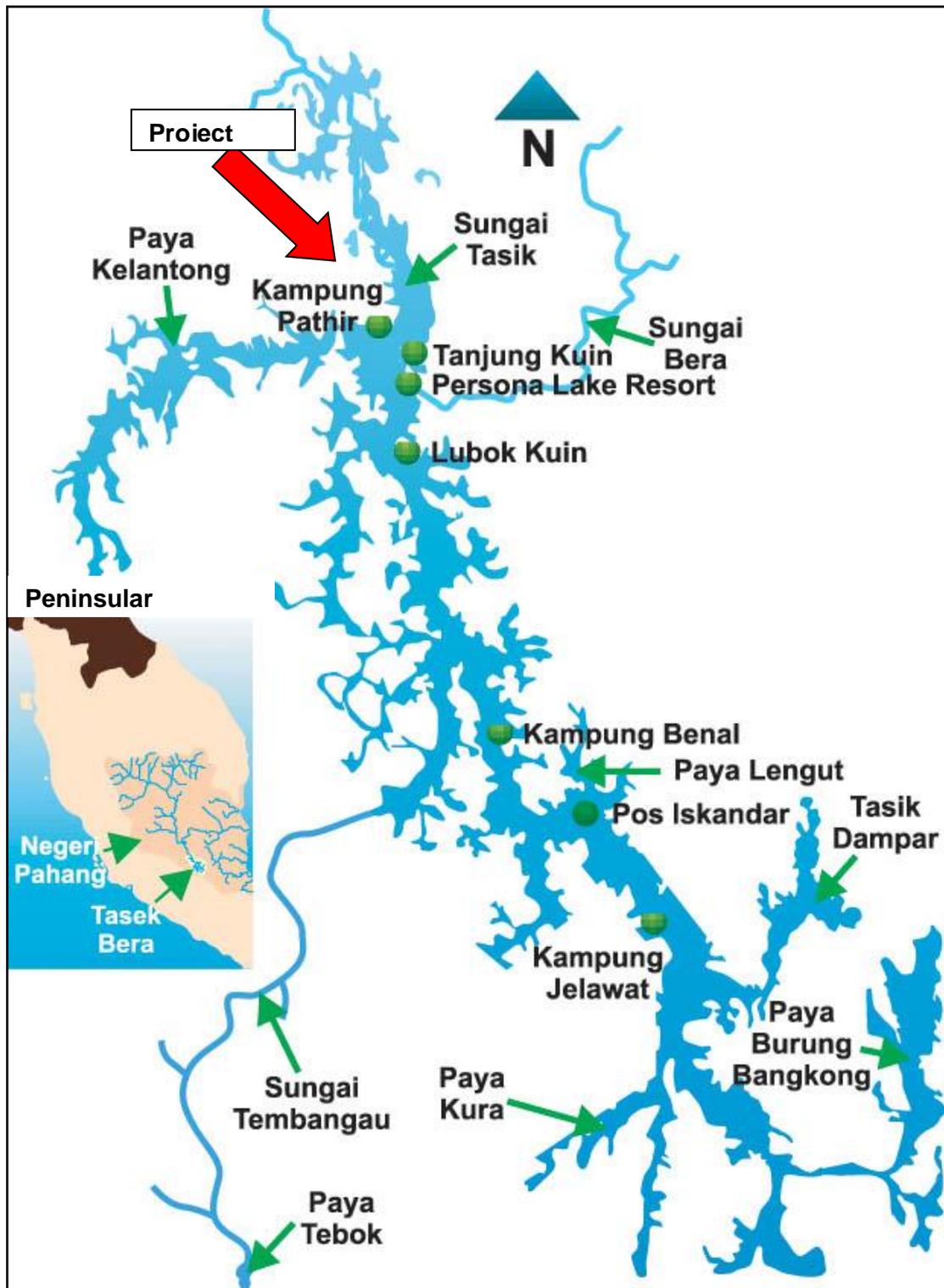
Tasek Bera, is a lowland alluvial riparian swamp system. It is located 3 5'N, 102 38E in the central lowlands of Peninsular Malaysia, where it lies within the catchment area of Sungai Pahang, the Peninsular's longest river. The wetland lies entirely within the Bera District, in the State of Pahang, although a small part of it falls in Negeri Sembilan. The wetland system consists of a dendritic complex of inflowing streams and swamps, measuring 34.6 km long by 25.3 km wide. The catchment area of Tasek Bera covers 61,380 ha, while the Ramsar Site covers 31,120 ha which includes over 6,800 ha of wetland habitats.

Water from Tasek Bera generally flows northwards along a main channel which joins Sungai Bera. (this river originates from the north-east of the Ramsar site). Sungai Bera then flows northwards into Sungai Pahang, which heads eastwards to the South China sea (See Map 1). Tasek Bera consists of a network of third and fourth order streams and swamp channels. These swamps are Tasik Dampar, Paya Burong Bangkong, Paya Kura, Paya Chenderong, Paya Lengut and Paya Kelantong. The project site – Kg. Pathir is located at the confluence of Paya Kelantong and Sungai Tasek (See Map 1).

### **The Semelai People of Tasek Bera: A Background**

The Semelai are indigenous people living along the banks and surrounding forests of Tasek Bera. Not much is known of their origins. However, archeological findings reveal that they have lived here for more than 600 years. Shifting cultivators by tradition, many of them discarded their nomadic lifestyles when they were relocated due to the Communist insurgency or 'Emergency' (1948-1960) and now most of them live in permanent villages in Pos Iskandar.

Map 1: Location of Tasek Bera and the Kampung Pathir (Project site)



Their main source of income is from tapping rubber on each of their six acre government sponsored land. The latex collected is sold as scrap rubber. Alternatively they operate sundry shops , work as factory workers or as labourers for timber companies and palm oil plantations. Some Semelai people still go hunting and fishing. They also trap land and water animals as well as collect forest products such as rattan, *keruing* resin and medicinal plants for a living.

Traditionally, the Semelai have viewed themselves, politically, as autonomous and separate from the Malay state. Their village chief or Batin is believed to be the older brother of the Malay sultan. However, they themselves admit, the Batin wears no regalia and may be poorer than ordinary villagers.

In the Semelai hierarchy, below the Batin are the menteri (minister) and the jruerah (supervisor for the collective village tasks). Usually the eldest son inherits these posts. However if his personal attributes are deemed unsuitable for the post, one of his younger brothers or cousins could be selected instead. The Batin's role is almost exclusively jural who would decide on matters of divorce, adultery, theft, and murder. A judgement hearing or meeting is done in public and anyone can attend. The *Puyang* (shaman), *bomoh* (lesser shaman) and healing ritual drummers decide on questions of incest (Mohala, 2003).

### **Taboos for medicinal plant collection**

There are certain taboos which have to be observed when collecting certain medicinal plants. They must be picked when a new moon is rising and never when it is waning. The plant / tree must face the rising sun and when picking the plant, one must continuously chant some prayers.

### **Semelai Traditional Medicine**

The Bomoh and the Puyang practice traditional healing in Semelai society. The Semelai people make a clear distinction between the expertise of the two. The bomoh is less powerful, only knowledgeable in medicinal herbs and incantations with the ability to conduct rituals that require only esoteric knowledge. In contrast, the puyang is gifted with psychic powers in addition to his extensive knowledge which allows him to observe and interact with supernatural entities in his dreams and in states of trance.

There are four basic kinds of healing rituals: charms and spells (*jampi*), cooling flour (tengpung), tenben, and belian. A bomoh can perform the first three whereas the puyang can conduct all four.

The *jampi* is the basic incantation or spell for misfortunes like poisoning, snakebites, breaking of a taboo, broken bones, a boil or a long childbirth. Most Semelai adults know a few basic spells for emergencies like poisoning. The words in incantations must be pronounced correctly for it to be effective. There is always an incantation container (*bekas jampi*) that the incantation is said into thus transferring the power of the words to the body of the patient.

## **MAIN AIM OF THE PROJECT**

This project aims to investigate the various uses of plants by communities within or near the Tasek Bera Ramsar site. It is hoped that by illustrating that many of the plants with medicinal values are valuable to the rural population, the value of these plants may be more appreciated, and to create an ethnobotany niche for the Semelai community of Tasek Bera by encouraging them to cultivate living pharmacies or herbal gardens in their home ground.

### **Objectives of the project**

1. To document and catalogue medicinal plants that are used by Semelai people in Tasek Bera.
2. To establish a herbal garden within the natural forest so as to promote ecotourism in Tasek Bera.
3. To promote the Semelai knowledge of medicinal plants that will generate interest and encourage further scientific research.

## **METHODS AND METHODOLOGY**

### **Local Community Engagement**

Involvement of the local community in the project is vital. Wetlands International has carried out this project using the participatory approach to ensure the sustainability of the project. Upon approval of the funding, we made a visit to Tasek Bera to meet the local community and to discuss with representatives from Semelai Association for Boat and Ecotourism (SABOT) about the project. They were enthusiastic about the project and were willing to work together to ensure the success of the project.

Mr. Rozyman, one of the SABOT's committee members has been chosen to be the leader to lead the project on site. A few shamans and a few local tour guides have been identified to help in the project. Issues regarding setting up of the project site and land ownership also have been discussed. The leader would have to discuss the land ownership with local village head and to identify suitable sites for setting up the herbal garden.

### **Medicinal Plants Survey at the Nearby Forest**

Two Semelai Shamans has been engaged to help in the identification of the plants used by the Semelai people. There are Pakcik Kohkoh and Pak Jipang. Pakcik Kohkoh is a local well known shaman and was a mid wife for the Semelai people. He is still actively involved in providing for needy people and he also collects herbal plants from the forest to sell to people outside the community who are seeking medicinal plants with tonic values. Meanwhile Pak Jipang is good in treating external injury and circumcision for young boys. Beside this, some SABOT's committee members who have good knowledge in medicinal plants also became important resource persons for the project.

On the second trip to Tasek Bera, we followed Pakcik(uncle) Kohkoh to the nearby secondary forest at Pos Iskandar to look for plants with medicinal values. One of the sites is a nearby rubber tree plantation and the other one in an abandoned rubber plantation. Despite being dressed appropriately for the fieldwork, the jungle

mosquitoes still attacked us. However, Pakcik Kohkoh still patiently showed us the plants. Pictures of plants were taken and the specimens collected for identification in the herbarium. Besides that, Pakcik Kohkoh also showed us the medicinal plants that he planted around his house compound.

SABOT's tour guide who has knowledge on medicinal plants also assisted us with identifying medicinal plants and explained their uses at the nearby forest at Pos Iskandar.

### **Medicinal Plants Survey at Virgin Jungle of Kampung Pathir**

Medicinal Plants Survey was carried out with help from SABOT's ecotour guides and local shaman – Pakcik Kohkoh and Pak Jipang. By using the existing trail as our baseline, whenever the shaman identified plants with medicinal values, we stopped to listen to his explanation on the plant and the parts used, the purposes and the method of preparation of the medicine. Task was divided among the team members to jot down notes, take photographs and collect specimens for herbarium identification. Herbarium voucher specimens were made from all collections and were sent to Rimba Ilmu Herbarium, University Malaya for further identification. Besides that, tags with codes were put up at the site for future reference in the field and also for specimen identification.

<b>Date</b>	<b>Purposes</b>
<b>Field Trip</b>	
29 – 30 April 2005	Engagement of Local Community in the project. Discussion on the project
25 – 28 July 2005	Compilation of plants with medicinal values by interviewing the local shaman and local ecotourism guides.
6 – 8 September 2005	Site Selection
8 – 11 November 2005	Plant Survey & Photography
28 – 30 November 2005	Plant Survey & Photography
13 – 15 February 2006	Photography & planting of medicinal plants
<b>Plant Identification</b>	
22 November 2005	Plant identification at Rimba Ilmu herbarium, University Malaya.
12 December 2005	Plant identification at Rimba Ilmu herbarium, University Malaya.
1 <sup>st</sup> March 2005	Plant identification at Rimba Ilmu herbarium, University Malaya.

## **Setting up a Herbal Garden**

### **Site Selection**

A SABOT member suggested setting up the herbal garden at a site near Kampung Jelawat which is about 100m from a river. It is a logged forest with an area of about 1 acre. There was no existing trails into the area. A temporary trail was made. The SABOT member's had an idea to set up the herbal garden by clearing an area in the forest to set up plots for planting plants with medicinal values. On the second trip to Tasek Bera, we were brought to the site. However, we found out that there were not many interesting medicinal plants at this area. The site is also quite far from the main road. Inaccessibility to area might discourage visitors from visiting the garden.

An arrangement was made to bring Professor Wong Koon Meng from University Malaya (UM) to give a second opinion on the selection of site. After the team from UM visited the area, Prof. Wong gave his comments on the site selection.

- i) There are no interesting plants with medicinal values that can be display if it is going to be a herbal garden
- ii) The logged forest has open canopy areas which allows more light to penetrate trough the forest floor which encourages the growth of secondary or invasive plant species. These plants will overgrow the herbal plants which requires shaded areas to grow it. It will be costly to maintain the garden as regular weeding and clearing need to be done.
- iii) The ambience is not present on this site as it overgrow with secondary forest plants species.
- iv) The risk of area being inundated during the wet season

Based on these comments, we then decided to visit another site at Kampung Pathir. This site is a distance from the Pos Iskandar, but it is one of the sites that the local guides bring visitors for their ecotourism activities. There are a few chalets and campground facilities nearby the proposed area. It would be a good site to cater for environmental programes for groups.

After visiting the new site, the UM team, SABOT committee and Wetlands International team decided to choose this site for the herbal garden. The reason being it is a good site that the forest is a virgin jungle and there is an existing trail that is often used by local guides to carry out ecotourism activities. Prof. Wong suggested that the theme for the herbal garden could be "garden in the forest". He advised us that we should carry out an inventory on the existing plants with medicinal values especially those along the trail, and maintain the plants on the existing sites or even increase the number of plants by transplanting them from surrounding areas. By doing so, we would be able to reduce the disturbance to the forest and lessen the maintenance work for the garden in future. SABOT committee members agreed to the suggestion given by Prof. Wong. They then discussed with the other villagers about the ownership of the land.

### **Planting**

A total of 40 plants species have been identified along the trail to be interpreted to visitors. The condition of the plants have been assessed and some suggestions were given to SABOT member on the number of plants needed to plant in a particular site. The saplings of the plants were obtained from areas around the trail within the forest and also a nearby forest. The number of plants to be planted depends on the size of the plants, availability of space and plant saplings. Factors that need to be considered during planting includes the habits, the condition growth of plants, eg. whether they need sunlight or shade, competition from surrounding plants and extra care on the method of planting. Some herbaceous plant need to planted with roots partially covered with soil and partially with forest litter eg. dried leaves and twigs.

## RESULTS

A total of 55 plants species with medicinal values, belong to 34 families, were identified. The families most commonly represented were the Myrsinaceae, Menispermaceae, Leguminosae, Myristicaceae, Euphorbiaceae and Rubiaceae with 3 species from each family. 41 species can be found along the Kg. Pathir virgin jungle trail (the herbal garden) and the other 13 species found outside the Kg. Pathir virgin forest area.

The medicines described in this study indicate the importance attached to preventive medicine and for good health. Seven different species were used in the preparation of aphrodisiacs and tonics. There are 15 different species that can be used for common illness like flu, fever & sore throat (7 species), stomachache (6 species) and headache (2 species). Many plants are also associated with various aspects of pregnancy and childbirth, especially contraception (2 species), to regain strength and health during confinement (4 species). Twelve species are used specifically to treat injuries such as sprains, burns or boils, scalds and rashes, wounds and skin irritation. The remaining species can be used to treat a variety of complaints such as high blood pressure, jaundice, kidney problem and constipation and sprains. Another interesting aspect would be the treatment that involves spells and supernatural beliefs. Four different plant species are used to ward off evil, treat people affected by spells and make people to like or be disliked by others. For details of the scientific name and local name of plants with medicinal values recorded during the project period, please refer to table 1.

**Table 1: List of Plants recorded with Medicinal Values along Kg. Pathir virgin jungle trail (Herbal Garden) and species found outside the Kg. Pathir virgin forest trail (Herbal Garden).**

	<b>Scientific Name</b>	<b>Local Name</b>	<b>Purposes</b>
1.	<i>Aglaonema nebulosum</i> N.E.Br. (Araceae)	Kayu ulat bulu	The poultice made from leaves and roots are used to cure skin irritation caused by caterpillar / worms.
2.	<i>Agrostistachys longifolia</i> (Euphorbiaceae)	Peret chengrang	Chopped root pieces are boiled and the decoction is taken to cure stomach-ache, bloody diarrhea and purging.
3.	<i>Amischotolype griffithii</i> (C.B. Clarke) I.M. Turner (Commelinaceae)	Sentawar	Parts of this plant are especially used to treat children if they are not feeling well. The roots are boiled and the decoction is taken to treat flu or other sickness in children. A few leaves and slices of roots placed in warm water is used to bathe children to provide relief from illness.
4.	<i>Amomum xanthophlebium</i> Baker (Zingiberaceae)  - endemic	Luchol / Halia Jacus or Halia Landak  (next to 004)	Smashed roots are applied to affected areas infected by burns and scalds.  Boiled root decoction is taken for body heat.  Dewdrops collected from the flower can be used as eye drops.
5.	<i>Apostasia nuda</i> R.Br. (Orchidaceae)	Penghilang Bau	Sap from root is applied all over body before entering forest. The sap release a scent which is thought to mask human scent thus keeping wild animals especially elephants.
6.	<i>Aquilaria hirta</i> Ridl. (Thymelaeaceae)	Gaharu	Resin burnt as joss sticks or as incense.
7.	<i>Ardisia sanguinolenta</i> Blume (Myrsinaceae)	Penehur	During confinement period, the roots are boiled and the decoction is taken to cure birth wound and also to cleanse the uterus.

	Scientific Name	Local Name	Purposes
8.	<i>Ardisia</i> sp. (Myrsinaceae)	Penjarang	Roots are boiled and decoction taken as contraceptive.
9.	<i>Artocarpus scortechinii</i> King (Moraceae)	Terap	<p>Traditionally made into bark clothes, especially trousers / pants by Semelai forefathers.</p> <p>First the Terap tree is felled. The inner layer of bark (middle of the trunk) is stripped away in big whole pieces. This bark is then beaten with a club made of hard wood, after which it is soaked for a few days (about 2-3 nights). It is then cut into the shape of shirts, trousers, etc.</p> <p>Sap from the tree can be made into a gum.</p> <p>Bark is boiled and the decoction drunk to cure stomach-ache.</p>
10.	<i>Calamus insignis</i> Griff. (Palmae)	Derey Batu or rotan batu	The root is mixed with the roots of Tongkat Ali ( <i>Eurycoma longifolia</i> ), boiled and decoction taken to boost energy.
11.	<i>Canarium littorale</i> Blume (Burseraceae)	Kedondong	Fruit eaten as an appetizer.
12.	<i>Champereia manillana</i> (Blume) Merr. (Opiliaceae)	Chempedai	<p>Shoots can be cooked in various ways as a vegetable.</p> <p>Leaves and roots chopped and applied to wounds to speed up the healing process and also for scabies.</p>
13.	<i>Clerodendrum deflexum</i> Wall. (Verbenaceae)	Kayu Selubang	Root sap extracted by rubbing against a rock is used to treat septic wounds.
14.	<i>Croton argyratus</i> Blume	Tempolong	Shoots from this plant are

	<b>Scientific Name</b>	<b>Local Name</b>	<b>Purposes</b>
	(Euphorbiaceae)		softened by heat, pressed and placed on affected area to treat Kudis / Kusta  The roots are rubbed on a stone and the sap / latex is used to treat rashes by applying on the affected area.
15.	<i>Cyclea laxiflora</i> Miers (Menispermaceae)	Selenban Beri	Raw or boiled tuber is taken to treat kidney problems and constipation.
16.	<i>Dianella ensiflora</i> (L.) DC. (Phormiaceae)	Setanggi	Roots burned underneath houses are believed to ward off evil spirits away.
17.	<i>Diospyros argentea</i> Griff (Ebenaceae) - endemic	Kerentah Roy (Roy=Dalat) =Sepetir dalat	The plant is burnt, especially the leaves to keep away flies.  Leaves when burnt make crackling noises which keep flies away.
18.	<i>Diospyros buxifolius</i> (Blume) Hiern (Ebenaceae)	Kayu perimbun rambut	Pounded leaves and roots are mixed with oil and applied daily to stimulate hair growth.
19.	<i>Dipterocarpus kerrii</i> King (Dipterocarpaceae)	Keruing	The resin from a Keruing tree was once used to light up torches which is rarely seen nowadays but the resin is still used as sealant for boats and musical instruments, to caulk boats and for varnishing.
20.	<i>Dracaena cantleyi</i> (Dracaenaceae)	Segemuk	The leaves are boiled and decoction is taken to increase body weight.
21.	<i>Elettatiopsis cf. curtisii</i> (Zingiberaceae)	Chepot	Juice obtained from smashed green leaves can be applied to the throat or taken to cure sore throat.  A few leaves are tied and pressed together until scent is emitted which is then tied around the forehead to provide relief from headache. It can also

	Scientific Name	Local Name	Purposes
			<p>be used to treat people affected by spells / black magic (jampi).</p> <p>It is only used by Bomoh and Tok Puyang to treat the patient. If used by ordinary person, it can become poisonous or make the illness worse.</p> <p>Rice paste and sap from smashed leaves are mixed and applied on the patient's head to cure fever.</p> <p>The leaves are placed in water and It is used for bathing to cure a child from fever.</p>
22.	<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Tongkat Ali	<p>The root is boiled and the decoction taken to boost energy levels also. It is used as an aphrodisiac. The decoction mixed with Ubi Jaga (<i>Smilax myosotiflora</i>) will make it more effective.</p> <p>Juice extracted from the leaves are used to treat rash or wounds.</p>
23.	<i>Fibraurea tinctoria</i> Lour. (Menispermaceae)  liana	Penawar Peraba	<p>The roots are cut into pieces and boiled. The decoction is drunk to treat stomach-ache and bloody diarrhoea. To make the decoction more effective, midur (<i>Goniothalamus tenuifolius</i>) and seluol (<i>Thottea grandiflora</i>) can be added in and boiled together.</p>
24.	<i>Ficus grossularioides</i> (Moraceae)	Sikat Nenek Kebayan	<p>Latex/sap from leaves is applied to treat boils.</p>
25.	<i>Goniothalamus tenuifolius</i> King (Annonaceae)	Midur	<p>The leaves and twigs are burnt during heavy storm to get rid of evil spirits.</p>

	Scientific Name	Local Name	Purposes
	- Endemic		The roots are cut into small pieces and boiled. The decoction is taken to treat stomach-ache, wounds infected during childbirth and also to treat diarrhoea.
26.	<i>Homolomena</i> sp. (ARACEAE)	Kelemunyang	To treat muscle sprains, a leaf poultice is placed on affected areas and bandaged.  The leaves are heated and bandaged around the stomach by using a long strip of cloth as post-natal treatment.
27.	<i>Iguana wallichiana</i> (Wall. Ex Mart.) Hook.f. var. <i>wallichiana</i> (Palmae)	Kit Kot	The roots are boiled with Tongkat Ali ( <i>Eurycoma longifolia</i> ) and rotan batu ( <i>Calamus insignis</i> ), and the decoction is taken to boost energy level and also as an Aphrodisiac.
28.	<i>Ixora</i> sapling (Rubiaceae)	Pemecah Darah	To treat bruises, the roots are mixed with cooking oil and applied on affected area.  The roots are boiled and the decoction is drunk for abortion.
29.	<i>Knema cinerea</i> var. <i>rubens</i> (Myristicaceae)	Mendarah	Red sap from stem obtained by making a slight incision on the bark which is used to treat mouth ulcers by applying on affected areas.
30.	<i>Knema kunstleri</i> (King) Warb. (Myristicaceae)	Mendarah	To treat bleeding gum and mouth.
31.	<i>Knema laurina</i> (Myristicaceae)		To treat bleeding gum and mouth.
32.	<i>Kunstleria</i> sp. (Leguminosae)	Serepet Pupuk	The young shoots (red or white in colour) are minced into paste which is then mixed with some water. The paste is then applied on the forehead to treat headache.

	Scientific Name	Local Name	Purposes
33.	<i>Labisia pumila</i> (Myrsinaceae)	Kacip Fatimah/ penawar kabuki	<p>The whole plant mixed with sentawar (<i>Amischotolype griffithii</i>) is boiled and decoction taken to treat flu.</p> <p>The roots and leaves are boiled and the decoction drunk or the leaves and roots are put in warm water which is then used to bathe sick children.</p>
34.	<i>Lasianthus</i> sp. (Rubiaceae)	Akar Busung	The roots are boiled and the water is then used for bathing to treat high fever especially when the patient starts shivering.
35.	<i>Licuala grandis</i>	Palas	The sapling / shoots or 'Umbat' is used in traditional medicine to treat all sorts of ailments. One of the treatments can last a whole night and is specially done by an appointed // authorised medicine man / shaman only. Otherwise, the unauthorised spell caster will be afflicted with disease or experience misfortune.
36.	<i>Lygodium circinnatum</i> (Burm.f.) Sw. (Schizaeaceae)	Pembenci	<p>The roots are mixed with cooking oil, incantations said (jampi) and applied on anyone that a person dislikes. It is believed that the potion will cause the targetted person to have more enemies or will not like the person he/she had initially liked or loved.</p> <p>It is also believed that if a person scrapes a bit of the tree bark of 2 trees in the forest that are creating a rubbing sound during strong wind and bits of bark are mixed with roots of pembenci and cooking oil the potion would become more effective.</p>

	Scientific Name	Local Name	Purposes
37.	<i>Melicope glabra</i> (Blume) T.G. Hartley (Rutaceae)		Sap from roots obtained by rubbing on stones are used to cure stomach pains and complaints.
38.	<i>Molineria latifolia</i> (Dryand.) Herb. Ex Kurz. Hypoxidaceae	Meg Beri	The roots are boiled and the decoction is taken to boost energy or to treat stomach-ache and bloody diarrhoea.  The fruit is also taken as an appetizer.
39.	<i>Phyllagathis rotundifolia</i> (Jack) Blume (Melastomataceae)	Kapal baning	The whole plant or only the leaves are boiled and the decoction is taken to treat high blood pressure.
40.	<i>Piper cf. caninum</i> (Piperaceae)	Sirih Pareh or sirih biawak in BM	The leaves and stems are soaked in warm water and used for bathing children with fever, epilepsy (sawan), pale complexion and several other serious illness.
41.	<i>Psychotria calocarpa</i> Kurz (Rubiaceae)	Sesalung biri	To treat rashes or wounds, poultice from roots are applied on affected areas.
42.	<i>Rourea rugosa</i> Planch. (Connaraceae)	Serepet	The roots are boiled and the decoction is taken to treat stomach-ache and bloody diarrhoea. To make the treatment more effective, other herbs with similar abilities are added in and boiled together with Serepet.  Dripping water from freshly cut stem can quench thirst.
43.	<i>Scaphium macropodum</i> (Miq.) BeumTe ex Heyne (Sterculiaceae)	Kembang Semangkuk	The fruits are used to make jam.
44.	<i>Scleropyrum pentandrum</i> (Dennst.) Mabb. (Santalaceae)	Limau Hantu	The roots are boiled and the decoction is taken as a contraceptive. It is believed that women will become barren after consuming the decoction

	<b>Scientific Name</b>	<b>Local Name</b>	<b>Purposes</b>
45.	<i>Shorea parvifolia</i> Dyer (Dipterocarpaceae)	Meranti	The decoction of the tree bark is drunk to cure stomach-ache.
46.	<i>Sindora</i> sp. (Leguminosae)	Sepetir	Water added to seed powder of <i>Sindora</i> sp. (obtained by rubbing against a stone) is consumed to cure many illness.
47.	<i>Smilax calophylla</i> Wall.ex A. DC. (Smilacaceae)	Segedang (find before 4 001)	The whole plant is boiled together with Paksa Bumi ( <i>Eurycoma longifolia</i> ) and Dedawai ( <i>Smilax</i> sp.) to boost energy level or as Aphrodisiac.
48.	<i>Smilax myosotiflora</i> A. DC. (Smilacaceae)	Ubi jaga	The tuber mixed with Tongkat Ali ( <i>Eurycoma longifolia</i> ) are boiled together and the decoction is taken to boost energy levels and also used as an aphrodisiac. Some of the old folks chew beetlenut with slices of <i>S. myosotiflora</i> tuber.
49.	<i>Spathobes ferrugineus</i> (Leguminosae)	Serikan	To treat mouth ulcers, the reddish latex / sap / resin is extracted from stem and applied on affected area.
50.	<i>Strychnos</i> sp. (Loganiaceae)	SM 76	The sap or juice from the roots are used as poison for darts (sumpitan).
51.	<i>Tetracera scandens</i> (L.) Merr. (Dilleniaceae)	Mempelas	Droplets of water/sap from freshly cut stems are used for eye irritation.  Juice gathered from smashing the stem are taken to reduce body heat.  Fresh leaves are used to smoothen wood carvings or woodwork.
52.	<i>Thottea grandiflora</i> Rottb. (Aristolochiaceae)	Seluol	The roots are rubbed on stone to extract juice which is then applied to cure swollen testicles. It can also be boiled in water and

	Scientific Name	Local Name	Purposes
			the decoction taken to cure stomach-ache.
53.	<i>Tinomisium petiolare</i> Hk.f&Th. (Menispermaceae)	Jemuk Kunyit	The whole plant with the roots are boiled in water. Bathing in this water will cure jaundice.
54.	<i>Trigonostemon malaccanus</i> Mnll. Arg. (Euphorbiaceae)	Kelant Tokchaong	The latex is used to treat mouth ulcers and tongue blisters.
55.	<i>Vernonia arborea</i> Buch.-Ham (Compositae)	Pemeltup Bedil Prak Tok Berih / Pelatuk Bedil	The leaf shoots are burned and the ash used to rub on pregnant women who are waiting to deliver, to initiate labour, so that they will have a quick delivery.

## CONCLUSION AND RECOMMENDATION

This study provides a census of some plant species which are easily available at the study site at Tasek Bera, and which are commonly used for medicinal purposes by the Semelai people of Tasek Bera. This information is a necessary first step in discovering which plant is effective for treating a particular ailment. It will serve as a reference for future studies into the plants phytochemical and pharmacological properties. It demonstrates the dependence of indigenous people on the natural forest for useful plants. The importance of such plants lies in the fact they have value as sources of active medicinal properties.

### Follow up of the project:

This project with co-funding from EC-UNDP Small Grant Fund (People and Tropical Forest) project will continue its effort in the production of signages for plant species with medicinal values that are found along a trail in Pathir village forest (herbal garden). We are also working on raising funds to train the local ecotourism guides to improve their knowledge and interpretation skills so that they can provide better explanation and to visitors. Lastly, we hope the photos of plants with medicinal values taken during the field trip and the information collected under this project will be used to develop a field guidebook. The aim of the guidebook would be to provide lay people with precise scientific data with illustrative descriptions and photos of plant species with medicinal properties found in Tasek Bera.

#### i) Design and Production of Signage for Herbal Garden

Signages will be put up for each plant species with medicinal value along the trail. The information on the signages will include the scientific names, families, local names and also the medicinal properties of each plant species.

## **ii) Interpretation Training**

Freeman Tilden describes '**interpretation**' in his book *Interpreting Our Heritage* as: "An educational activity which aims to reveal meaning and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than to simply communicate factual information." Therefore, in this project, we realise that it is very important to train the Semelai ecotourism guides to be skillful in interpretation so that they can provide better service visitors to the herbal garden. A guide who possesses good interpretation skills would be able to assist the visitor to developing a keen awareness, appreciation, and understanding of the value of medicinal plants found in Tasek Bera forest. We hope that under EC-UNDP Small Grant Fund (People and Tropical Forest) project, we would able to conduct a series of interpretation training workshops for the ecotourism guides.

## **iii) Publish a field guidebook for plants with medicinal values recorded under this project.**

The publication of this guidebook will be very useful for schools, local government officials, environmental NGOs and the general public. The main purpose of this guidebook is to create public awareness of the many medicinal plants that are found at Tasek Bera Ramsar Site. It is hoped that the guidebook will help readers to recognise and identify these plants, learn about their features and traditional uses by the Semelai people.

## **ACKNOWLEDGEMENTS**

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**APPENDIX 1: List Of Plant Recorded And Planted Along The Kampung Pathir Virgin Forest Trail According To Cord Number Display In The Trail Map**

	<b>Scientific Name</b>	<b>Local Name</b>	<b>Purposes</b>
001	<i>Vernonia arborea</i> Buch.-Ham (Compositae)	Pemeltup Bedil Prak Tok Berih / Pelatuk Bedil	The leaf shoots are burned and the ash used to rub on pregnant women who are waiting to deliver, to induce labour, so that they will have a quick delivery.
002	<i>Ardisia sanguinolenta</i> Blume (Myrsinaceae)	Penehur	During confinement period, the roots are boiled and the decoction is taken to cure birth wound and also to cleanse the uterus.
003	<i>Smilax calophylla</i> Wall.ex A. DC. (Smilacaceae)	Segedang (find before 4 001)	The whole plant is boiled together with Paksa Bumi ( <i>Eurycoma longifolia</i> ) and Dedawai ( <i>Smilax</i> sp.) to boost energy level or as Aphrodisiac.
004	<i>Calamus insignis</i> Griff. (Palmae)	Derey Batu or rotan batu	The root is mixed with the roots of Tongkat Ali, boiled and decoction taken to boost energy.
005	<i>Goniothalamus tenuifolius</i> King (Annonaceae)  - Endemic	Midur	The leaves and twigs are burnt during heavy storm to get rid of evil spirits.  The roots are cut into small pieces and boiled. The decoction is taken to treat stomach-ache, wounds infected during childbirth and also to treat diarrhoea.
006	<i>Thottea grandiflora</i> Rottb. (Aristolochiaceae)	Seluol	The roots are rubbed on stone to extract juice which is then applied to cure swollen testicles. It can also be boiled in water and the decoction taken to cure stomach-ache.
007	<i>Elettariopsis cf. curtisii</i> (Zingiberaceae)	Chepot	Juice obtained from smashed green leaves can be applied to the throat or taken to cure sore throat.

	Scientific Name	Local Name	Purposes
			<p>A few leaves are tied and pressed together until scent is emitted which is then tied around the forehead to relief headache. It can also be used to treat people affected by spells / black magic (jampi).</p> <p>It is only used by Bomoh and Tok Puyang to treat the patient. If used by normal people, it can become poisonous or make the illness worse.</p> <p>Use the leaves to tie on the head to cure headache and fever.</p> <p>Rice paste and sap from smashed leaves are mixed and applied on the patient's head for fever.</p> <p>The leaves are placed in water and bathed to relief a child from fever.</p>
008	<p><i>Amomum xanthophlebium</i> Baker (Zingiberaceae)</p> <p>- endemic</p>	<p>Luchol / Halia Jacus or Halia Landak</p> <p>(next to 004)</p>	<p>Smashed roots are applied to affected areas infected by burns and scalds.</p> <p>Boiled root decoction is taken for body heat.</p> <p>Dewdrops collected from the flower can be used as eye drops.</p>
009	<p><i>Fibraurea tinctoria</i> Lour. (Menispermaceae)</p>	<p>Penawar Peraba</p>	<p>The roots are cut into pieces and boiled. The decoction is drunk to treat stomach-ache and bloody diarrhoea. To make the decoction more effective, midur (<i>Goniothalamus tenuifolius</i>) and seluol (<i>Thottea grandiflora</i>) can be added in and boiled together.</p>

	Scientific Name	Local Name	Purposes
010	<i>Tetracera scandens</i> (L.) Merr. (Dilleniaceae)	Mempelas	Droplets of water/sap from freshly cut stems are used for eye irritation.  Juice gathered from smashing the stem are taken to remove body heat.  Fresh leaves are used to smoothen wood carving.
011	<i>Rourea rugosa</i> Planch. (Connaraceae)	Serepet	The roots are boiled and the decoction is taken to treat stomache and bloody diarrhoea. To make the treatment more effective, other herbs with similar abilities are added in and boiled together with Serepet.  Dripping water from freshly cut stem can quench thirst.
012	<i>Kunstleria</i> sp. (Leguminosae)	Serepet Pupuk	The young shoots (red or white in colour) are made minced into paste is then mixed with some water. The paste is then applied on forehead to treat headache.
013	<i>Phyllagathis rotundifolia</i> (Jack) Blume (Melastomataceae)	Kapal baning	The whole plant or only the leaves are boiled and the decoction is taken to treat high blood pressure.
014	<i>Melicope glabra</i> (Blume) T.G. Hartley (Rutaceae)	Check with Pak Kohkoh	Sap from roots obtained by rubbing on stones are used to cure stomach pains and complaints.
015	<i>Knema cinerea</i> var. <i>rubens</i> (Myristicaceae)	Mendarah	Red sap from stem obtained by making a slight incision on the bark is used to treat mouth ulcers by applying on affected areas.
016	<i>Apostasia nuda</i> R.Br. (Orchidaceae)	Penghilang Bau	Sap from root is applied all over body before entering forest. The sap release a

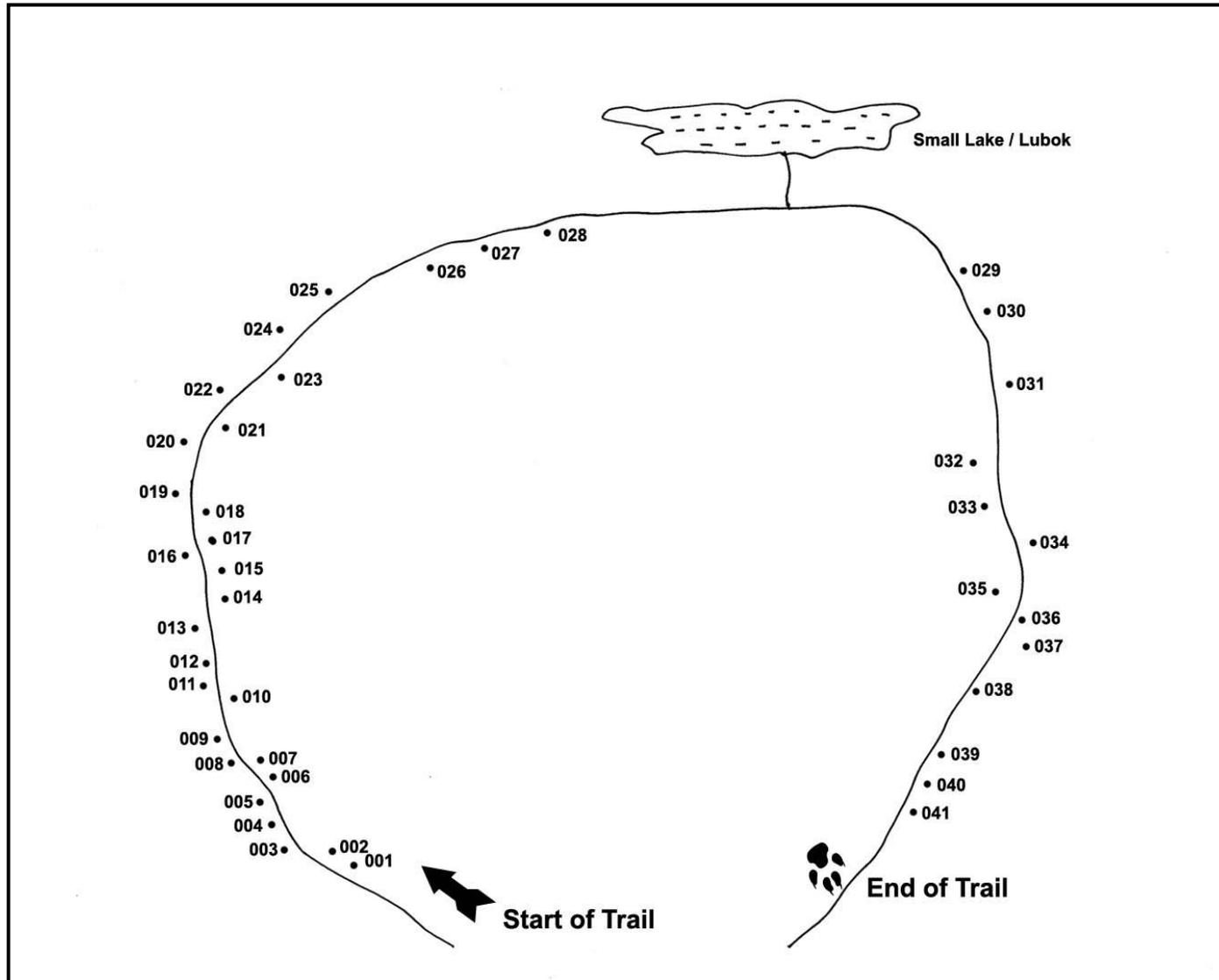
	Scientific Name	Local Name	Purposes
			scent which is thought to mask human scent thus keeping wild animals especially elephants away.
017	<i>Dracaena cantleyi</i> (Dracaenaceae)	Segemuk	The leaves are boiled and decoction is taken to increase body weight.
018	<i>Trigonostemon malaccanus</i> Mnll.Arg. (Euphorbiaceae)	Kelant Tokchaong	The latex is used to treat mouth ulcers and tongue blisters.
019	<i>Aquilaria hirta</i> Ridl. (Thymelaeaceae)	Gaharu	Resin burnt as joss sticks or as incense.
020	<i>Shorea parvifolia</i> Dyer (Dipterocarpaceae)	Meranti	The decoction of the tree bark is drunk to cure stomachache.
021	<i>Croton argyratus</i> Blume (Euphorbiaceae)	Tempolong	Shoots from this plant are softened on flame, pressed and placed on affected area to treat Kudis / Kusta  The roots are rubbed on stone and the sap / latex is used to treat rashes by applying on affected area.
022	<i>Canarium littorale</i> Blume (Burseraceae)	Kedondong	Fruit eaten as an appetizer.
023	<i>Licuala grandis</i>	Palas	The sapling / shoots or 'Umbat' is used in traditional medicine to treat all sorts of ailments. One of the treatments can last a whole night and is specially done by an appointed // authorised medicine man / shaman only. Otherwise, the unauthorised spell caster will be afflicted with disease or experience misfortune.
024	<i>Diospyros buxifolius</i> (Blume) Hiern (Ebenaceae)	Kayu perimbun rambut	Pounded leaves and roots are mixed with oil and applied daily to stimulate hair growth.
025	<i>Molineria latifolia</i> (Dryand.) Herb. Ex Kurz. Hypoxidaceae	Meg Beri	The roots are boiled and the decoction is taken to boost energy or to treat

	Scientific Name	Local Name	Purposes
			<p>stomach-ache are and bloody diarrhoea.</p> <p>The fruit also taken as an appetizer.</p>
026	<i>Scaphium macropodum</i> (Miq.) BeumTe ex Heyne (Sterculiaceae)	Kembang Semangkuk	The fruits are used in making jam.
027	<i>Tinomiscium petiolare</i> Hk.f&Th. (Menispermaceae)	Jemuk Kunyit	The whole plant including the roots is boiled in water. Bathing with this water treats jaundice.
028	<i>Spathobes ferrugineus</i> (Leguminosae)	Serikan	To treat mouth ulcers, the reddish latex / sap / resin is extracted from stem and applied on affected area.
029	<i>Agrostistachys longifolia</i> (Euphorbiaceae)	Peret chengrang	Chopped root pieces are boiled and the decoction is taken to cure stomach-ache, bloody diarrhoea and purging.
030	<i>Smilax myosotiflora</i> A. DC. (Similacaceae)	Ubi jaga	The tuber mixed with Tongkat Ali ( <i>Eurycoma longifolia</i> ) are boiled together and the decoction is taken to boost energy levels and also used as an aphrodisiac. Some of the old folks chew beetlenut with slices of <i>S. myosotiflora</i> tuber.
031	<i>Lygodium circinnatum</i> (Burm.f.) Sw. (Schizaeaceae)	Pembenci	<p>The roots are mixed with cooking oil, incantations said (jampi) and applied on anyone that a person dislikes. It is believed that the potion will cause the targetted person to have more enemies or will not like the person he/she had initially liked or loved.</p> <p>It is also believed that if a person scrapes a bit of the tree bark of 2 trees in the forest that create rubbing sound during strong wind and bits of bark are mixed</p>

	Scientific Name	Local Name	Purposes
			with roots of pembenci and cooking oil the potion would become more effective.
032	<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Tongkat Ali	The root is boiled and the decoction taken to boost energy levels also. It is used as an aphrodisiac. The decoction mixed with Ubi Jaga ( <i>Smilax myosotiflora</i> ) will make it more effective.  Juices squeezed from leaflets are used to treat rash or wounds.
033	<i>Scleropyrum pentandrum</i> (Dennst.) Mabb. (Santalaceae)	Limau Hantu	The roots are boiled and the decoction is taken as a contraceptive. It is believed that women will become barren after consuming the decoction
034	<i>Diospyros argentea</i> Griff (Ebenaceae) - endemic	Kerentah Roy (Roy=Dalat) =Sepetir dalat	The plant is burnt, especially the leaves to chase away flies.  Leaves when burnt make crackling noises which keep flies away.
035	<i>Psychotria calocarpa</i> Kurz (Rubiaceae)	Sesalung biri  Sesalong??	To treat rashes or wounds, leaf poultice from roots are applied on affected areas.
036	<i>Dipterocarpus kerrii</i> King (Dipterocarpaceae)	Keruing	The resin from a Keruing tree was once used to light up torches which is rarely seen nowadays but the resin is still used as sealants on boats and musical instruments, to caulk boats and for varnishing.
037	<i>Artocarpus scortechinii</i> King (Moraceae)	Terap	Traditionally made into bark clothes, especially trousers / pants by Semelai forefathers.  First the Terap tree is

	Scientific Name	Local Name	Purposes
			<p>felled. The inner layer of bark (middle of the trunk) is stripped away in big whole pieces. This bark is then beaten with a club made of hard wood, after which it is soaked for a few days (about 2-3 nights). It is then cut into the shape of shirts, trousers, etc.</p> <p>Sap from the tree can be made into a gum.</p> <p>Bark is boiled and the decoction drunk to cure stomach-ache.</p>
038	<i>Amischotolype griffithii</i> (C.B. Clarke) I.M. Turner (Commelinaceae)	Sentawar	<p>Parts of this plant are especially used to treat children if they are not feeling well. The roots are boiled and the decoction is taken to treat flu or other sickness in children. A few leaves and slices of roots placed in warm water is used to bathe children to provide relief from illness.</p>
039	<i>Labisia pumila</i> (Blume) Fern.-Vill (Myrsinaceae)	Kacip Fatimah/ penawar kabuki	<p>The whole plant mixed with sentawar (<i>Amischotolype griffithii</i>) is boiled and decoction taken to treat flu.</p> <p>The roots and leaves are boiled and the decoction drunk or the leaves and roots are put in warm water which is then used to bathe children who is sick.</p>
040	<i>Lasianthus</i> sp. (Rubiaceae)	Akar Busung	<p>The roots are boiled and the water is then used to bathe to treat high fever especially when the patient starts shivering.</p>
041	<i>Strychnos</i> sp. (Loganiaceae)		<p>The sap or juice from the roots are used as poisons on darts (sumpitan).</p>

**APPENDIX 2: Location Of Plant Species With Medicinal Value Planted Along The Trail For Education And Trail Interpretation Purposes (Refer To Appendix 1 For Name And Properties Of The Plants)**



### APPENDIX 3: Financial Report

<b>Budget</b>		
A. Personnel	Description	Cost (£) £1 = RM6.84
Wetlands International (WI) Technical Services	Resource support – Equipment (plastic bags, preservatives, camera, replanting material-spade, hoe, bucket, fertiliser); Documentation, and editing; Training in sustainable use concept – maintenance of herbarium garden	300
WI Project Officer 1	Project implementation and coordination	650
<ul style="list-style-type: none"> <li>• Short-term consultant from University Malaya</li> <li>• Plant Identification from University Malaya</li> </ul>	Input in plant identification, taxonomy (4 days)	500
	Field Survey	250
<b>B. Local Assistance</b>		
Semelai Project staff	2 Boatmen (boat or canoe hire), 4 3 guides, 2 shamans with expertise in traditional medicine	1100
Subsistence	For field trip and work at site	610
Consumables	Stationery, film, food and drinks for meetings with Semelai community	500
<b>C. Travel and vehicle rental</b>	Transport to and from the Project site	700
<b>D. Printing materials</b>	Printing report	180
<b>E. Communication</b>	Fax, e-mail, postage, telephone, courier	210
<b>Total</b>		<b>5000</b>