Measurable Effectiveness Indicators (MEIs)-Technical Report

Abstract:

The concept of High Conservation Value Forest (HCVF) is one the many aspects of forest management that needs to be properly understood and adequately implemented in the field by a forest manager before the Forest Management Unit (FMU) under question could be considered and approved by the forest management auditors as being well-managed under the Forest Stewardship Council (FSC)'s Principles and Criteria (P&C) of Forest Stewardship. Being relatively new it is not surprising when the concept of HCVF solicits different reactions from different forest managers who may have varying interpretations and hence different ways and approaches in handling its various requirements. It is not surprising therefore when FMUs were often given Major CARs (Corrective Action Requests) frequently associated with HCVF – a situation which could be both distressing and embarrassing. Under the circumstance the development of sets of "measurable effectiveness indicators (MEI)" appropriate to the identified HCVF area, could help the forest manager, auditors as well as stakeholders to forge a better understanding towards a common appreciation and understanding of the FMU being managed. An indicator is something that points to an issue or condition. Its purpose is to show one how well a system is working. If there is a problem, an indicator can help one determine what direction to take to address the issue. Consequently MEIs for HCVFs are as varied as the types of HCVF systems being monitor. However, there are certain characteristics that MEIs have in common:

- MEIs are **relevant;** they show one something about the system that one needs to know.
- MEIs are **easy to understand,** even by people who are not experts.
- MEIs are **reliable;** the information that the indicator provide can be trusted.
- MEIs are based on **accessible data;** the information is available or can be gathered while there is still time to act.

This paper describes the management of the HCVFs within Cherul Forest Concession in Malaysia which has been recognized as a well-managed forest by the Forest Stewardship Council (FSC) since 2012.

Key words: High Conservation Value Forest, Effectiveness indicators, Forest--dependent communities, well-managed forest, Tropical Rain Forest, Checklist of Sustainable Measures.

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Measurable Effectiveness Indicators (MEIs) for HCVFs within Cherul Forest Concession (CFC), Terengganu, Malaysia

By

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1.0 Introduction

Cherul Forest Concession (CFC) is a 20,234-hectare track of well-managed natural Tropical Rain Forest (TRF) of the Mixed Dipterocarp Forest (MDF type which has been under a continuous management of Pesama Timber Corporation Sdn Bhd (PESAMA) since early 1980s under the principle of sustainable forest management (SFM) and following the dictates of the Malaysian Selective Management System (SMS). In 2012 CFC was certified as a "well-managed forest" by the world-renown certifying body the Forest Stewardship Council (FSC) after having successfully complied with all FSC's Principles and Criteria (P&C) of Forest Stewardship.

2.0 Cherul Forest Concession: Location and Physical Setting

CFC is located within the state of Terengganu Darul Iman, Malaysia, within Cherul Permanent Reserved Forest (CPRF), covering a total area of 25,243ha (approx. 50,000 acres) between the geographical coordinates that range from 4^0 05' 20"N and 103^0 06' 20"E to $4^0$06"N and 102^0 53.5"E in the south; and 4^0 16'N and 102^o45" in the north, thereby giving it an almost triangular shape (Fig. 1). It consists largely of logged-over (i.e. second growth) natural forest land of Cherul PRF comprising a total of 59 forest compartments.

The land-use in the surrounding lowland areas mainly comprises vast oil palm estates under FELDA Cherul 3, Ladang RISDA Espek 6, Ladang Ban Hoe Espek 6 and *Ladang Rakyat* Bukit Bandi schemes as well as Cherul Village. To reach at the forest concession from Chukai Town by road, one has to drive 30km westward toward Cheneh Rest & Recreation (R & R) station at Bandar Cheneh Baru from which one should follow the Bukit Besi-bound trunk road, turning to the left upon crossing Sungai Cherul. From there a 10-km drive will take one to a junction to CFC Base Camp which lies on the right just after crossing Sungai Ban Hoe. The journey to CFC Base Camp from this junction on a gravel-earth logging road which is maintained by PESAMA takes about 14 km.

Cherul Permanent Reserved Forest (CPRF) is separated on its eastern side by these land development schemes by Sungai Jenaang, whereas CFC's boundary within CPRF is marked by Sungai Kelih, *i.e.* after passing through a total of at least 4 logging license areas. Lying on the northwest of CFC and hugging all of its western fronts is Chenderong Concession, whilst Remen-Chereh PRF of Pahang lies on its southeast.

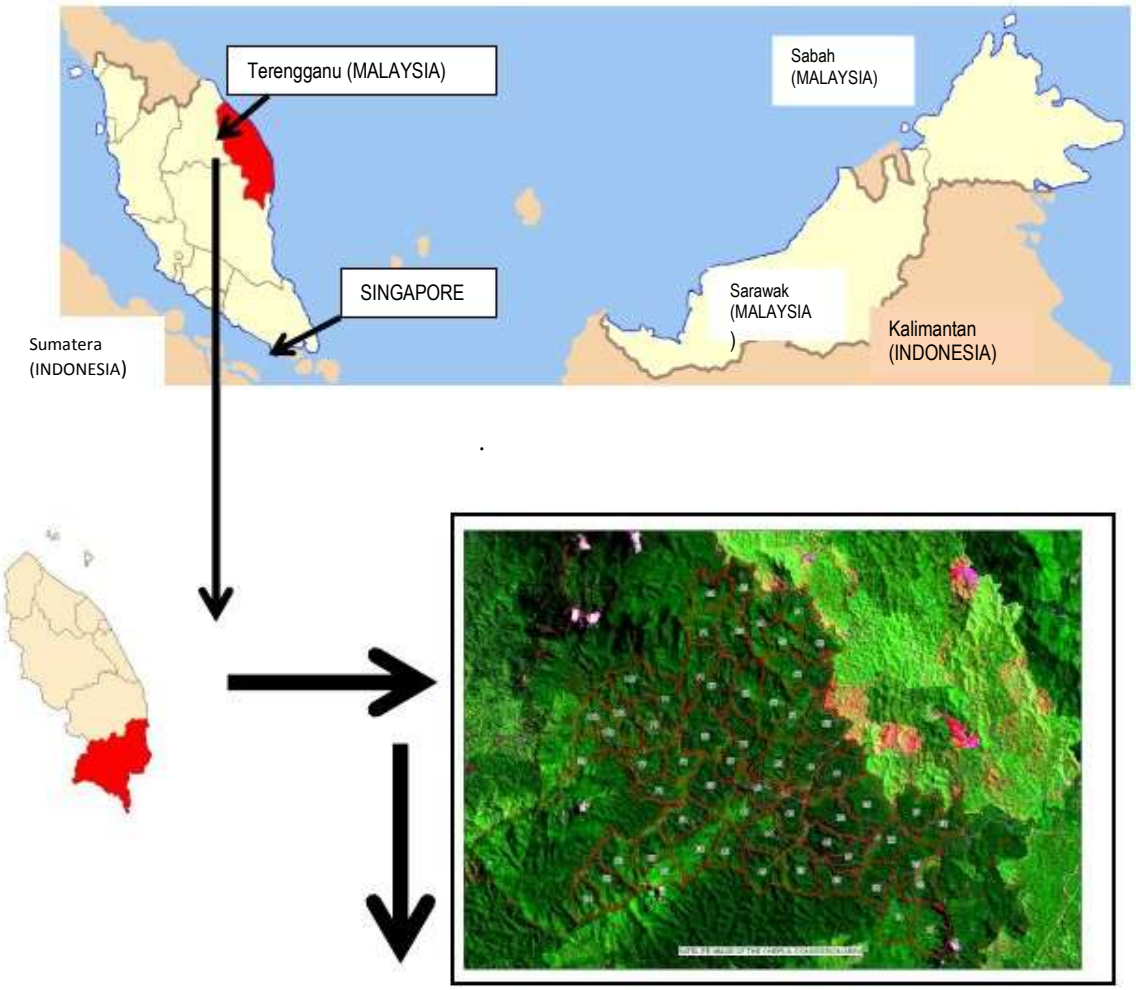


Fig. 1. Cherul Forest Concession

is located in the southwestern corner of the State of Terengganu, Malaysia

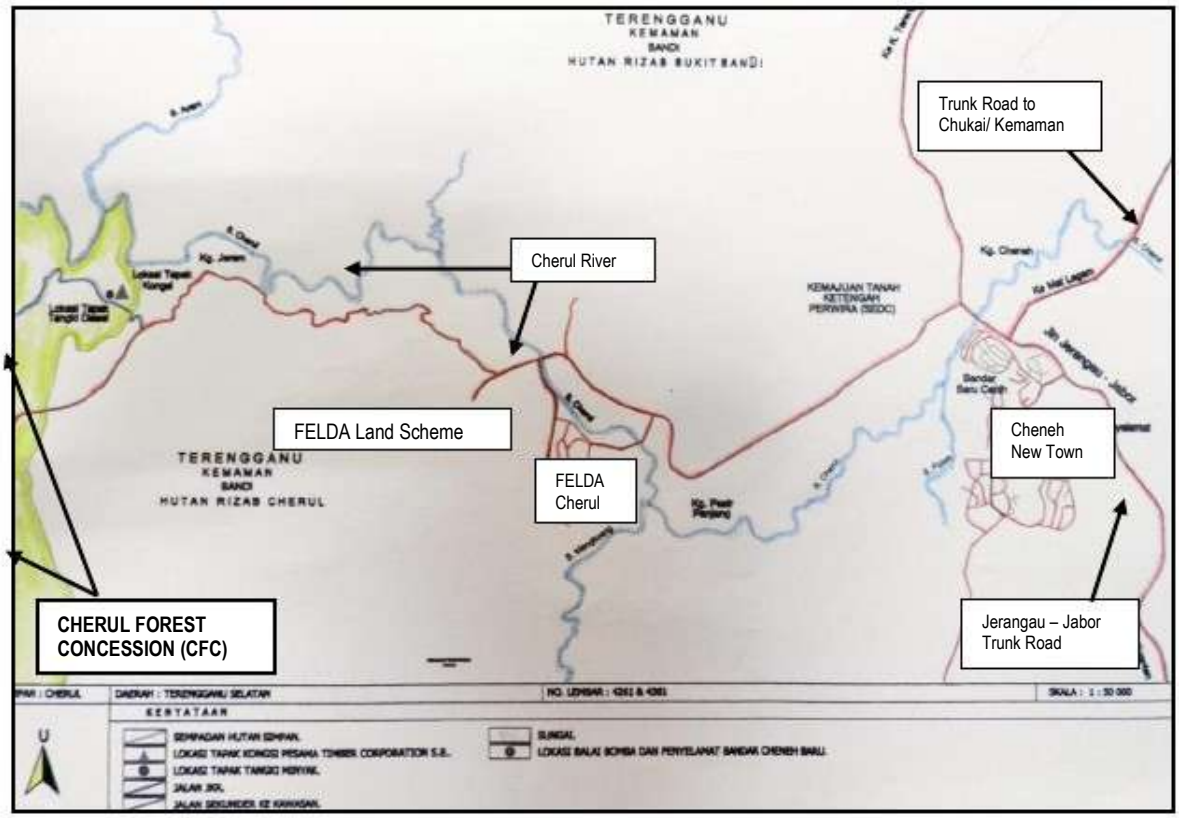


Fig. 2. Map Showing Location of Cherul Forest Concession Relative to Cheneh New Town and Chukai/ Kemaman trunk road in Terengganu.

PESAMA currently manages CFC following the globally accepted principle of Sustainable Forest Management (SFM) which incorporates and balance up its three main components, namely

(1) economic and technical;
(2) environmental protection and conservation; and
(3) social responsibility.

These above-mentioned 3 components of SFM are in line with FSC's 10 Principles of Forest Stewardship, to which PESAMA subscribes (see www.pesama.com.my)

Among others FSC's P&C calls for Pesama to establish and manage identified High Conservation Value Forests (HCVFs) in its concession area according to a set of criteria. Table 1 shows the HCVFs in relation to other land use types within CFC. As of February 2016 Pesama has a total of three (3) HCVFs as follows:

1. The Durian (Durio zibethinus) fruit orchard within Comp. 35 traditionally "belonging" to the local aborigines (Orang Asli) community, and
2. The animal salt lick in Compartment 35, CFC.
3. The Neram (Dipterocarpus oblongifolius) stream along River Cherul.

The locations of the three HCVFs are as shown in Fig. 3 and 4.

Table 1. Forest Functions In CFC In Relation To The Functions Defined In The National Forestry Act, 1984.

National Forest Policy 1992 & National Forestry Act 1993	**Forest Zonation in CFC**			**Area**
Production Forest	(1) Sustainable Timber Production, (2) Safeguarding of Water Resource, (3) Preservation of Biodiversity		Timber Production (TP), Water CatchmentConservation, **HCVF** (Gross Area)	17,968 (Gross Area)
Protection Forest	Soil Protection	Conditional zone Soil Protection	1. Non-Productive Area 2. Main & Secondary Forest Road 3. Matau in Compt 43	1,306 104 10
	Safeguarding of Water Resources		Riparian Buffer Protection (RBP): (1) Sg Cherul (2) Sg Mas Kemaman - Kuantan	72 24 49
	State Boundary		HOT SPRING IN C66, C69, C70	163ha
Amenity Forest	1. Recreation; (2) Ecotourism; (3) Amenity, (4) Rare Ecosystem Protection ITTO Research Forest in Compartment 39			
Research& Education Forest				380ha
Mining concession	Parts of C28, C29, C43, C44			167ha
TOTAL				20,243

2.0 Measurable Effectiveness Indicators (MEIs)

An indicator is something that points to an issue or condition. Its purpose is to show you how well a system is working. If there is a problem, an indicator can help you determine what direction to take to address the issue. Indicators are as varied as the types of systems they monitor. However, there are certain characteristics that effective indicators have in common (www.sustainablemeasures.com/node/92)

- Effective indicators are **relevant;** they show you something about the system that you need to know.
- Effective indicators are **easy to understand,** even by people who are not experts.
- Effective indicators are **reliable;** you can trust the information that the indicator is providing.
- Lastly, effective indicators are based on **accessible data;** the information is available or can be gathered while there is still time to act.

Fig. 3. Location of the Durian Fruit Orchard and Animal Saltlick HCVF.

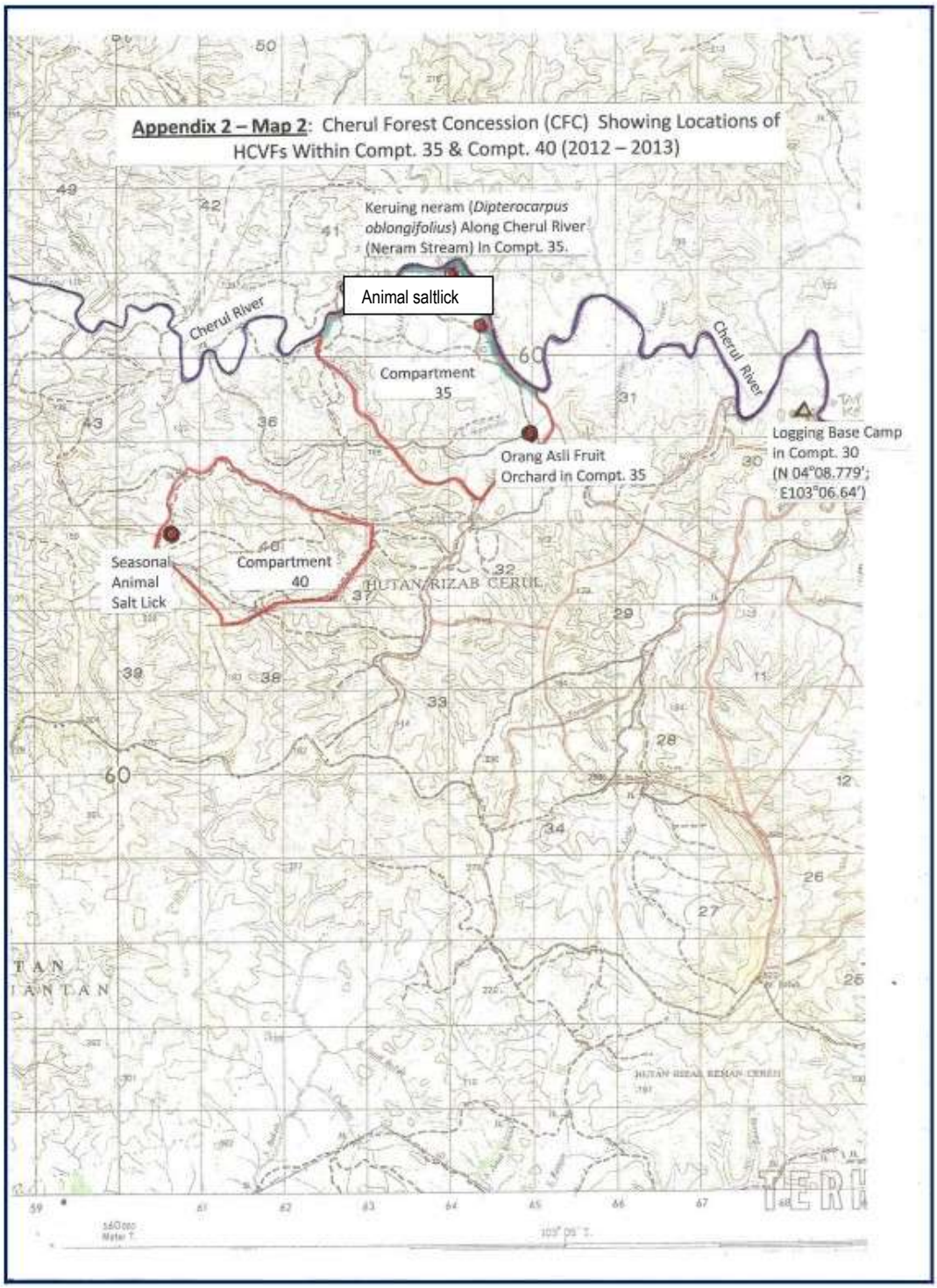
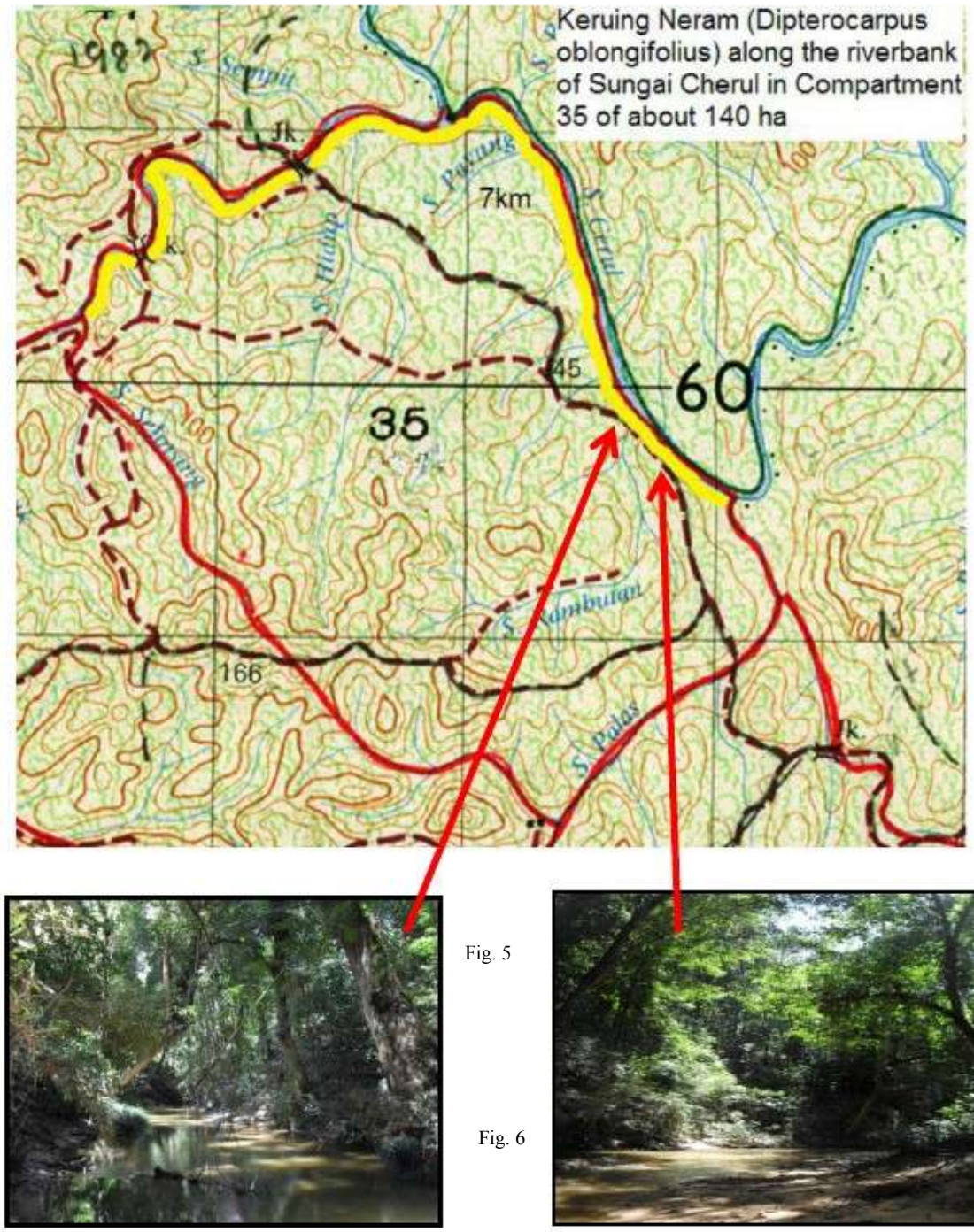


Fig. 4. The Keruing Neram HCVF (marked in Yellow).



Figs. 5 & 6. The Riverine Neram Forests along Cherul River.

As of the moment the following sets of variables and parameters have been shortlisted as having the potential to serve as possible indicators to be used to measure the level of effectiveness of the identified HCVFs within CFC.

Their respective measurement protocols and format as well as units of measurement will be developed by CFC in due course.

2.1 The Orang Asal (Aborigine) Durian Fruit Orchard

(1) The increase in awareness about the D. zibethinus stand, its autecology, and significance to the life and culture of the local Orang Asal community could possibly be measured in the following ways

1) Number of research conducted, institutions involved, research grants/ funds made available / allocated, etc
2) Number of research/ technical reports prepared, published and disseminated
3) Number of press reports on the site and its significance to the Orang Asal community
4) Number of queries received
5) Number of visitations to the site
6) Volume of harvest of durian fruits and the associated monetary value
7) Number of Orang Asal benefiting from the existence and maintenance of the Durian fruit orchard.

Fig. 7

Fig.8

Figs. 7 & 8. The Durian (Durio zibethinus) fruit orchard traditionally maintained by the local Aborigine (Orang Asal) community within Cherul Forest Concession area.

Fig. 9. The author standing in front of the temporary hut built by the Aborigines during Durian fruiting season.

Fig. 10.

The more "civilized" government-assisted Aborigine village of nearby Kampung Sungai Pergam.

(2) The increase in protection level accorded the species and orchard (i.e. site) could be evidenced by:

HCVF area being well-protected through clearly-demarcated boundaries - this is being affected by Pesama in close cooperation with TSFD whereby the distribution of tasks and responsibilities between the two parties have been clearly identified. Under the arrangement, Pesama bears the responsibility to maintain the integrity of the HCVF areas whereas TSFD exert its enforcement authority where appropriate. At the same time interested agencies such a WWF-Malaysia, FRIM and academic institutions conduct their respective work in close coordination by Pesama.

1) The Durian fruit orchard well-identified and maintained
2) Sample trees and wildings are well-marked and protected
3) Zero encroachment into the area
4) Zero modification/ manipulation of the site
5) Zero intrusion of foreign objects and/or organism into the site
6) Zero incidence of fire
7) Incidence of windthrow
   Incidence of floods.
8)

(3) Increased conservation of the species through the following efforts:

1) Wildings collected and raised in the nursery (number, quality, survival rates)
2) Growth, mortality and recruitment of the species under natural condition
3) Phenological behaviour of the species (e.g. flowering, fruiting, seeding, shooting).

2.2 Animal/ Wildlife Salt lick in Compt 35, CFC (Figs. 11, 12, 13)

Measurable effectiveness indicators for this unique HCVF site will be developed along the following line:

1) Animal saltlick and the surrounding area well-protected
2) Zero encroachment into the area
3) Zero modification/ manipulation of the site
4) Zero intrusion of foreign objects and/or organism into the area
5) Zero incidence of fire
6) Incidence of windthrow monitored
7) Records of wildlife as observed through camera traps and other means.
8) Number of publications on the findings
9) Number of research conducted on the wildlife in the area

Fig. 11

Fig. 12

Fig. 13

2.3 The Neram Stream HCVF (Figs. 4, 5, 6)

Measurable effectiveness indicators for this HCVF (140 ha = 7km long x 20m wide) will be developed along the following lines:

(1) Protection and maintenance of river and riparian ecosystem

i. Monitoring of riverbank – erosion
ii. Survey and monitoring of flora & fauna (i.e. biodiversity)
iii. This is being done as part and parcel of the general maintenance and protection of the Riparian Buffer Zones within CFC (see **Fig. 14)**

(2) Protection and maintenance of Neram trees

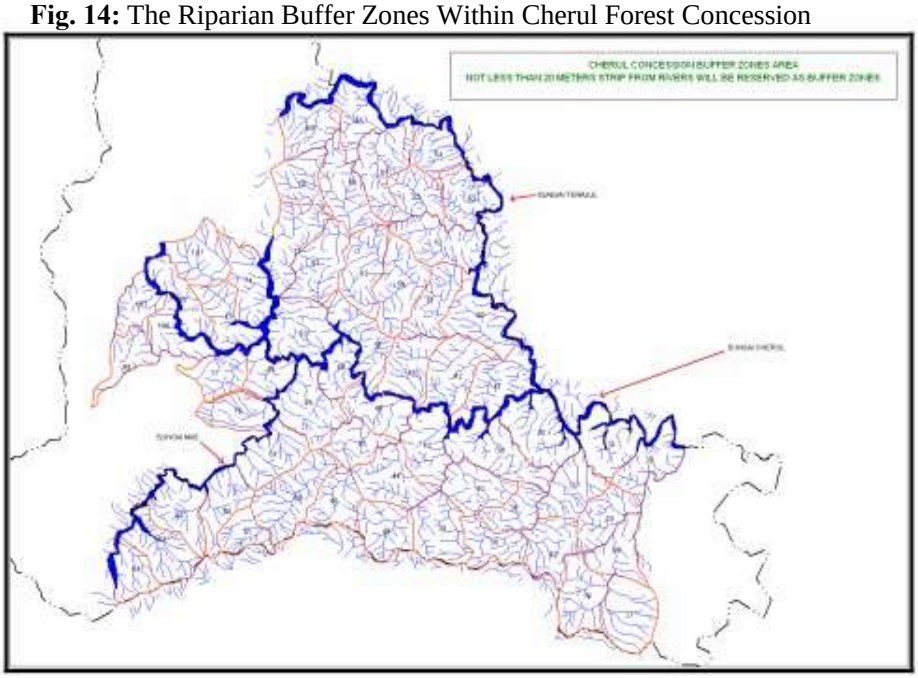
i. Monitoring of health of Neram trees
ii. Studies on flowering and fruiting patterns
iii. Collection of wildings
iv. Studies on ecological relationships with riverine fauna

(3) Protection and maintenance of river water quality

i. Water quality: physical and chemical
ii. Water flow pattern
iii. Protection from pollution

In developing the measurable effectiveness indicators for the HCVF within CFC, Pesama strives to provide satisfactory and impartial answers to the following 14 checklist of Sustainable Measures (www.sustainablemeasures.com/node/92):

Fig. 14: The Riparian Buffer Zones Within Cherul Forest Concession



1. Does the indicator address the carrying capacity of the natural resources -- renewable and nonrenewable, local and nonlocal -- that the community relies on?
2. Does the indicator address the carrying capacity of the ecosystem services upon which the community relies, whether local, global, or from distant sources?
3. Does the indicator address the carrying capacity of esthetic qualities -- the beauty and life-affirming qualities of nature -- that are important to the community?
4. Does the indicator address the carrying capacity of the community's human capital -- the skills, abilities, health and education of people in the community?
5. Does the indicator address the carrying capacity of a community's social capital -- the connections between people in a community: the relationships of friends, families, neighborhoods, social groups, businesses, governments and their ability to cooperate, work together and interact in positive, meaningful ways?
6. Does the indicator address the carrying capacity of a community's built capital -- the human-made materials (buildings, parks, playgrounds, infrastructure, and information) that are needed for quality of life and the community's ability to maintain and enhance those materials with existing resources?
7. Does the indicator provide a long-term view of the community?
8. Does the indicator address the issue of economic, social or biological diversity in the community?
9. Does the question address the issue of equity or fairness -- either between current community residents (intra-generational equity) or between current and future residents (inter-generational equity)?
10. Is the indicator understandable to and useable by its intended audience?
11. Does the indicator measure a link between economy and environment?
12. Does the indicator measure a link between environment and society?
13. Does the indicator measure a link between society and economy?
14. Does the indicator measure sustainability that is at the expense of another community or at the expense of global sustainability?

3.0 Summary and Recommendations

The concept of High Conservation Value Forest (HCVF) is one the many aspects of forest management that needs to be properly understood and adequately implemented in the field by a forest manager before the Forest Management Unit (FMU) under question could be considered and accepted by the forest management auditors as being well-managed under the Forest Stewardship Council (FSC)'s Principles and Criteria (P&C) of Forest Stewardship.Being relatively new it is not surprising when the concept of HCVF solicits different reactions from different forestry authorities and forest managers who may have their own perceptions and interpretations and hence different ways and approaches on how to deal with it in the larger context of sustainable forest management (SFM) principles. Under the circumstance the development of sets of "measurable effectiveness indicators (MEI)" appropriate to the identified HCVF area, could form the first step towards a better appreciation of the resource as well as its value and function. An indicator is something that points to an issue or condition. Its purpose is to show one how well a system is working. If there is a problem, an indicator can help one determine what direction to take to address the issue. Consequently MEIs for HCVFs are as

varied as the types of HCVF systems being monitor. Under the FSC standard there are at least 6 categories of HCVFs covering the whole gamut of SFM concept and application, be they at local, regional or global levels. Nonetheless, there are certain characteristics that MEIs have in common:

- MEIs are **relevant;** they show one something about the system that one needs to know.
- MEIs are **easy to understand,** even by people who are not experts.
- MEIs are **reliable;** the information that the indicator provide can be trusted.
- MEIs are based on **accessible data;** the information is available or can be gathered while there is still time to act.

On the part of Pesama Timber Corporation Sdn Bhd who has been entrusted to manage CFC on a sustainable basis, the next step forward would be to refine the MEIs as elaborate in this paper, develop the appropriate standard operating procedures (S.O.P.s) and formats of measurement, and subsequently put them into practice accordingly, bearing in mind that not all of the 14 Checklist of Sustainable Measures mentioned above are relevant or applicable to Pesama/ CFC situations. This must be followed with the appropriate training and mentoring programmes as well as record keeping and documentation.

References:

www.pesama.com.my

www.sustainablemeasures.com/node/92

Annex 1:

Monitoring Protocols For Measurable Effectiveness Indicators (MEI) For HCVHs Within Cherul Forest Concession (CFC)

[Protokol Pemantauan Bagi Indikator Keberkesanan Bolehukur bagi HCVF Di Dalam KHC]

Nama HCVF: Kebun Durian Orang Asal
Disediakan Oleh:

Tempoh Pemantauan:
Tarikh:

Kriteria	Indikator	Kuantiti/ Nilai	Catatan Pegawai Bertugas	Komen/ Pemerhatian MR/ GM
1. Increase in awareness on D. zibethinus, its autecology, significance to the OA community [Peningkatan dalam kesedaran mengenai species dan kebun durian ini, autekologi serta kepentingannya kepada budaya dan kehidupan komuniti OA]	1. Number of research conducted [Bilangan projek kajian/ penyelidikan dijalankan]			
	2. Number of research/ technical report prepared, published and disseminated [Bilangan laporan penyelidikan/ kertas teknikal disedia, diterbit & disebarkan]			
	3. Number of press report/ coverage [Laporan akhbar/ majalah]			
	4. Number of queries received [Bilangan pertanyaan diterima]			
	5. Number of visitation to the site [Bilangan lawatan/ kunjungan ke tapak]			
	6. Volume of harvest of durian fruits [Hasil tuaian buah durian]			
	7. Money value of durian harvest [Nilai kewangan dari tuaian buah durian]			
	8. Number of OA benefiting			

	[Bilangan OA yang menerima faedah]			
	9. Other produce from the site [Hasil hutan lain daripada tapak berkenaan]			
2. Increase in protection level accorded the species & HCVF site [Peningkatan dalam tahap perlindungan ke atas spesies dan tapak HCVF]	1. Boundaries clearly identified and marked. Durian fruit orchard easily identified. [Sempadan HCVF dikenalpastui dan ditandai dengan jelas]			
	2. Sample trees well-marked and protected [Pokok-pokok contoh ditandai dan dilindungi dengan baik]			
	3. Illegal felling and damage on trees [Penebangan haram dan kerosakan ke atas pokok]			
	4. Encroachment into the area [Pencerobohan ke dalam kawasan HCVF]			
	5. Modification/ manipulation to the site. [Modifikasi dan pengubahsuaian ke atas tapak]			
	6. Intrusion of foreign objects/ organisms/ materials. [Pemasukan bendasing/ organisma/ bahan dari luar]			
	7. Fire [Kebakaran]			
	8. Windthrow [Pokok tumbang]			
	9. Flood [Banjir]			
3. Increased Conservation of the spesies and HCVF site [Peningkatan dalam pemuliharaan spesies dan tapak	1. Wildings collected and raised in the nursery (numbers, quality, and survival rates) [Pengutipan anakliar dan dibesarkan di tapaksemaian – bilangan,kualiti dan kadar kehidupan]			

HCVF]				
	2. Growth, mortality and recruitment of the species under natural condition [Tumbesaran, kematian dan kehidupan spesies berkenaan di dalam kondisi semulajadi]			
	3. Phenological behaviour of the species (e.g. flowering, fruiting, seeding, shooting) [Kelakuan fenologi spesies (cth: pembungaan, pembuahan, pengeluaran biji benih, pengeluaran pucuk muda].			

Annex 2:

Monitoring Protocols For Measurable Effectiveness Indicators (MEI) For HCVHs Within Cherul Forest Concession (CFC)

[Protokol Pemantauan Bagi Indikator Keberkesanan Bolehukur bagi HCVF Di Dalam Konsesi Hutan Cherul (KHC)]

Nama HCVF: Animal Saltlick
Disediakan Oleh:

Tempoh Pemantauan:
Tarikh:

Kriteria	Indikator	Kuantiti/ Nilai	Catatan	Komen/ Pemerhatian MR/ GM
1. Increase in awareness on the need to protect wildlife through sound management of the forest. management. [Peningkatan dalam kesedaran mengenai pentingnya melindungi hidupan liar menerusi amalan pengurusan hutan yang baik]	1. Number of research conducted [Bilangan projek kajian/ penyelidikan dijalankan]			
	2. Number of research/ technical report prepared, published and disseminated [Bilangan laporan penyelidikan/ kertas teknikal disedia, diterbit & disebarkan]			
	3. Number of press report/ coverage [Laporan akhbar/ majalah]			
	4. Number of queries received [Bilangan pertanyaan diterima]			
	5. Number of visitation to the site [Bilangan lawatan/ kunjungan ke tapak]			
	6. Number & species of wildlife detected in the vicinity as well as those using the salt lick in the HCVF [Bilangan dan spesies hidupanliar dikesan di kawasan sekitar serta yang dipantau menggunakan tasik garam]			
	7. Money value of the HCVF [Nilai kewangan dari kehadiran HCVF]			
	9. Other produce from the site			

	[Hasil hutan lain daripada tapak berkenaan]			
2. Increase in protection level accorded the wildlife species & HCVF site [Peningkatan dalam tahap perlindungan ke atas spesies hidupanliar dan tapak HCVF]	1. Boundaries clearly identified and marked. The animal salt lick HCVF could be easily identified. [Sempadan HCVF dikenalpastui dan ditandai dengan jelas]			
	3. Illegal felling and damage on trees around HCVF [Penebangan haram dan kerosakan ke atas pokok di sekitar HCVF]			
	4. Encroachment into the area [Pencerobohan ke dalam kawasan HCVF]			
	5. Modification/ manipulation to the site. [Modifikasi dan pengubahsuaian ke atas tapak]			
	6. Intrusion of foreign objects/ organisms/ materials into HCVF [Pemasukan bendasing/ organisma/ bahan dari luar ke dalam HCVF]			
	7. Fire [Kebakaran]			
	8. Windthrow into HCVF [Pokok tumbang ke dalam HCVF]			
	9. Flood [Banjir]			

Annex 3:

Monitoring Protocols For Measurable Effectiveness Indicators (MEI) For HCVHs Within Cherul Forest Concession (CFC)

[Protokol Pemantauan Bagi Indikator Keberkesanan Bolehukur bagi HCVF Di Dalam KHC]

Nama HCVF: Neram Stream
Disediakan Oleh:

Tempoh Pemantauan:
Tarikh:

Kriteria	Indikator	Kuantiti/ Nilai	Catatan	Komen/ Pemerhatian MR/ GM
1. Protection and maintenance of river and riparian ecosystem	1. Monitoring of riverbank – erosion [Memantau kestabilan tebing sungai]			
	2. Survey and monitoring of flora & fauna (i.e. biodiversity) - This is being done as part and parcel of the general maintenance and protection of the Riparian Buffer Zones within CFC. 3. Number of queries received [Bilangan pertanyaan diterima]			
	4. Number of visitation to the site [Bilangan lawatan/ kunjungan ke tapak]			
	5. Studies on ecological relationships with riverine fauna			
	6. Other produce from the site [Hasil hutan lain daripada tapak berkenaan]			
2. Protection and maintenance of Neram trees	1. Boundaries clearly identified and marked. The animal salt lick HCVF could be easily identified. [Sempadan HCVF dikenalpastui dan ditandai dengan jelas]			
	3. Illegal felling and damage on trees around HCVF			

	[Penebangan haram dan kerosakan ke atas pokok di sekitar HCVF]			
	4. Encroachment into the Neram stream area [Pencerobohan ke dalam kawasan HCVF]			
	5. Modification/ manipulation to the site. [Modifikasi dan pengubahsuaian ke atas tapak]			
	6. Intrusion of foreign objects/ organisms/ materials into HCVF [Pemasukan bendasing/ organisma/ bahan dari luar ke dalam HCVF]			
	7. Monitoring of health of Neram trees [Pemantataun kesehatan pokok neram]			
	8. Studies on flowering and fruiting patterns [Kajian ke atas pola pembungaan dan pembuahan]			
	9. Collection of wildings [Pengutipan anakliar]			
	10. Fire [Kebakaran]			
	11. Windthrow into HCVF [Pokok tumbang ke dalam HCVF]			
	12. Flood [Banjir]			
3. Protection and maintenance of river water quality	1. Water quality: physical and chemical [Kualiti air: fisikal dan kemikal]			
	2. Water flow pattern [Pola aliran air sungai]			
	3. Protection from pollution [Perlindungan daripada pencemaran]			