

## MEASURABLE, REPORTABLE AND VERIFIABLE (MRV) FOR MONITORING EMISSION REDUCTIONS AND ENHANCEMENT OF CARBON STOCKS IN MERU BETIRI NATIONAL PARK (MBNP)

PSPs are designed for:

- Supporting data and information for the purpose of ground truthing to backed up wall-to wall mapping using satellite images,
- For this activity, a total of 40 PSPs have been made that represent all zones in MBNP, consisting: 19 PSPs are located in nucleus zone, 16 PSPs are in forest zone, 3 PSPs are located in rehabilitation zone, 1 PSP is placed in buffer zone, and 1 PSP is in intensive utilization zone.
- To apply MRV principle, carbon measurement of PSPs are referred to IPCC Guideline that measure 5 carbon pools namely above ground biomass, below ground biomass, necromass, litter and soil. In this activity, initial measurement has been made to identify carbon pools in every PSP consisting of above ground biomass (tree, pole and undergrowth), litter (non woody necromass), and soil.

The aim of the implementation of demonstration activities (DA) is to test and develop methodologies, technology and institution of sustainable forest management that endeavor to reduce carbon emission through controlling deforestation and forest degradation, as well as carbon enhancement. As mandated in Decision 1/CP.13 of the Bali Action Plan, how to develop a national MRV that meet international standard and cost effective, need to be solved. In general the necessary aspect needed for MRV can be seen in Table 1.

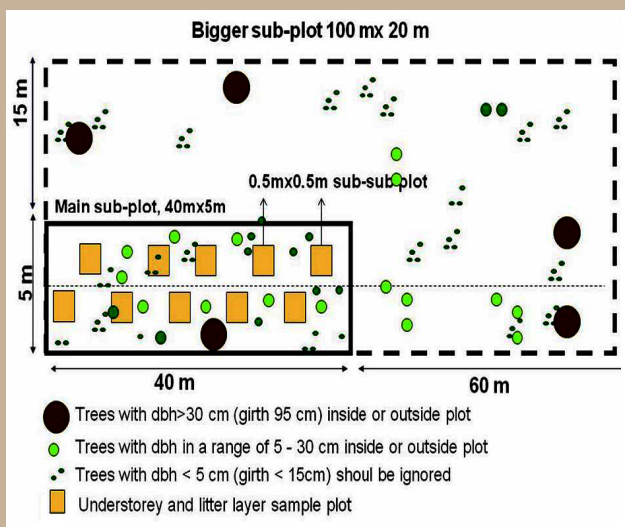
Table 1. Mitigation Action for MRV

MRV on	Supported by	Activity needed
Baseline (CO <sub>2-e</sub> )	Data, Communities and Institutional Capacity Building	PSP and Inventory, Consultation, Training
Deviations from Baseline	Data, Communities, Public and Private Participation	Policies, Enforcement Laws
2-3 years reportable emissions	National Communication	Updated Inventory

Table 1 clearly stated the importance of resource inventory including forest, and communities level for participating in inventory. To understand current state of communities level of participation in MRV for carbon accounting, communication and training is a must to be undertaken.

### PSP for Continuous Forest Inventory and Measurement

Forest inventory refer to the inventory for determining growth by repeated inventories of permanent sample plots (PSP). For ground based inventory, permanent sample plots (PSP) measuring at 20 x 100 meter has been applied for MBNP. A total of 40 PSPs representing each zone within MBNP, and land use category according to IPCC has been made. Table 2 shows the data from forest inventory in term of dominant tree species, and associated variables needed for carbon accounting.



## PHOTOS OF ACTIVITIES



Ready for departure, Team of Project Boundary and PSP



Measurement of coordinates points using GPS



Placement of PSP pole in the field



Pole of PSP that has been planted



Collection of non woody necromass

**Table 2. Data of Dominant Tree, Soil, Underground and Litter of PSPs**

PSP No	Dominant Tree	Tree Density (Cm <sup>2</sup> gr)	Soil pH	Undergrowth (kg/ha)	Litter (Kg/ha)
1	Nipah ( <i>Nypa fruticans</i> )	0.1320	4.8	18,026.77	-
2	Kelapa ( <i>Cocos nucifera</i> )	0.3389	6.0	1,462.91	2,298.25
3	Kedawung ( <i>Parkia timoriana</i> )	0.5414	4.6	1,589.57	-
4	Langsep ( <i>Lansium domesticum</i> )	0.8087	4.5	15,921.86	802.52
5	Cempagan ( <i>Dysoxylum sp</i> )	0.6572	5.8	1,729.62	2,470.00
6	Pakem ( <i>Pangium edule</i> )	0.4422	5.6	1,600.00	5,720.00
7	Berasan ( <i>Gomphia serrata</i> )	0.8492	5.2	4,080.00	4,240.00
8	Besole ( <i>Chydenanthus ecelcus</i> )	0.6292	4.5	575.95	2,003.77
9	Pakem ( <i>Pangium edule</i> )	0.4502	4.6	120.00	4,591.67
10	Rubber ( <i>Hevea braziliensis</i> )	0.6239	6.1	2,640.00	318.32
11	Walangan ( <i>Eryngium foetidum</i> )	0.0496	5.0	559.43	3,991.05
12	Cakar Ayam ( <i>Selaginella doederleinii</i> )	0.7795	5.0	350.78	4,373.33
13	Garu ( <i>Antidesma montanum</i> )	0.0880	4.5	385.00	3,007.60
14	Besole ( <i>Chydenanthus ecelcus</i> )	0.7810	4.7	1,533.33	2,931.24
15	Apak	0.3968	4.6	1,594.56	3,320.39
16	Gondang ( <i>Ficus sp</i> )	0.3996	4.3	814.81	2,532.65
17	Kluntungan	0.6477	4.9	311.10	3,565.83
18	Kedu	0.5873	4.4	855.56	2,315.66
19	kembang jelaprang ( <i>Cananga odorata</i> )	0.2406	4.4	871.63	2,808.47
20	Pluncing	0.4989	3.6	1,922.29	3,247.95
21	Candle nut ( <i>Aleurites moluccana</i> )	0.5158	4.8	804.67	-
22	Besole ( <i>Chydenanthus ecelcus</i> )	0.6265	5.8	1,789.72	1,559.24
23	Berasan ( <i>Gomphia serrata</i> )	0.3494	5.8	1,459.64	1,481.82
24	Berasan ( <i>Gomphia serrata</i> )	0.6165	5.6	1,254.81	2,344.42
25	Berasan ( <i>Gomphia serrata</i> )	0.4791	5.6	1,819.54	2,024.78
26	Sentul ( <i>Sandaricum koetjape</i> )	0.5596	4.5	1,098.28	1,670.30
27	Timo ( <i>Kleinhovia hospita</i> )	0.4865	4.9	2,465.37	7,908.05
28	Keningar ( <i>Cynamomum aromaticum</i> )	0.6529	4.3	1,426.91	4,905.28
29	Sriwil Kutil ( <i>Sterculia campanulata</i> )	0.4379	4.8	6,366.90	1,159.43
30	Glindungan ( <i>Bischofia javanica</i> )	0.5855	4.0	1,883.54	4,569.78
31	Rubber ( <i>Hevea braziliensis</i> )	0.6772	4.6	6,074.23	2,212.94
32	Tancang ( <i>Bruguiera</i> )	0.2859	4.8	146.67	1,845.00
33	Kenongo ( <i>Kanangium odoratum</i> )	0.5111	4.7	639.33	4,335.49
34	Sentul ( <i>Sandaricum koetjape</i> )	0.6149	5.0	916.09	12,701.35
35	Jati ( <i>Tectona grandis</i> )	0.5478	3.4	2,522.35	2,487.74
36	Kedawung (( <i>Parkia timoriana</i> )	0.4801	4.9	9,284.05	-
37	Bambu Bubat ( <i>Bambusoideae sp</i> )	0.6547	4.8	3,145.02	5,721.10
38	Pluncing	0.5013	4.8	8,400.00	6,160.00
39	Timo ( <i>Kleinhovia hospita</i> )	0.5600	5.2	1,894.13	4,394.13
40	Jambu Air ( <i>Eugenia sp.</i> )	0.7781	6.2	2,092.00	1,960.00

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