

Project Description (PD): Reforestation and restoration of degraded mangrove lands, sustainable livelihoods and Community development in Myanmar - World View International Foundation

COMMENTS

Comments about eligibility:

There is not support for the no forest criteria at the start date. They cited a study carried out by FAO before the project start date, but it is not clear how this study prove the no forest criteria in the project area. They include all the area as eligible, and it is not clear if they extract the water bodies (see Page 42, Fig. 10) and other lands (as villages, etc.) from the eligible area.

The separation between reforested and restored areas is not necessary if all area is classified as no forest.

Pag. 20. About conditions before project initiation: There is not support for the demonstration of no forest condition according to FAO criteria for 2015 and ten years before.

Pag. 33. There is not an analysis of define the project boundaries (degraded vs. no mangroves). According to the PO all the areas are no forest.

Comments about mortality rates:

There is not scientific support for the mortality rates they used. According to Bayraktarov et al. (2016), the average survival rate in restoration projects in mangroves is 51%, and in the best case, developed countries could achieve 56,3%. Nevertheless, in this PD is mentioned a survival rate for the area of 80% (Pag. 78) and there is not documented support for this number. Likewise, there is not support for the distribution of mortality rates over the years. For this PD they assume mortality is zero for the first three years and only 5% for the year 4. Despite the range of survival rates for the first plantation years is wide (Primavera and Esteban, 2008), some studies such us Toledo (2001) reported survival of 77% until 1,5 years and 74% after year two.

Why for the case of restoration areas (Plantation density: 2000 trees) do they assume mortality zero?

Comments about estimation of carbon stocks in aboveground biomass:

It is not consistent with the document about the project scale, size, and type of project. We think the estimations are overestimated, but in the hypothetic case those estimations are correct, the project must be classified as large scale. Additionally, throughout the document, there are inconsistencies with the classification of the type of project (in some cases they mention there is a grouped project, e.g. page 32, and in other sections they say it is not a grouped project).

Pag 49. They use the allometric equation for biomass estimation proposed by Sukardjo and Yamada (1992). We think this equation cannot be used because its diametric range is 3,9 cm to 7,80 cm (see

article). In this sense, according to the Table showed in page. 49, the equation only is applicable for years 5-7.

In case this equation is accepted for *ex-ante* estimations, it cannot be used for *ex-post* estimation due to the following reasons:

According to Tool 14, V.4.2 it is necessary to apply the Tool “*Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities*”, which requires the accomplishment of the following conditions:

(a) The equation is used in the national forest inventory, or the national GHG inventory, of the host Party; (b) The equation has been used in commercial forestry sector of the host Party for 10 years or more; (c) The equation was derived from a data set of at least 30 sample trees, and the value of coefficient of determination (R^2) was not less than 0.85.

In this sense, the equation is not applicable for *ex-post* estimations due to it was built with 10 data.

Pag. 49. What is the precedence of Table with Diameter per year? Was there enough data to adjust the curve? Was there a monitoring for plots for different ages? Additionally, considering the plantation density is like a natural mangrove, is difficult to achieve the same diameter per tree as in a plantation scenario, especially, because there are not management practices.

Pag. 50. The Equation used for the estimation of mean change in the biomass per hectare in trees is only applicable for *ex-post* estimation. This equation requires plot remeasures. For this *ex-ante* estimations, Equation 13 must be used. Furthermore, for the estimation presented in the [PD](#), there was a mistake in the use of the Equation used because they did not include the number of plots in the estimations.

Pag. 59-60. Tables 19 and 20 show the change in C stock in reforestation and restoration strata. Final values are in tCO₂e/ha/year. We did the exercise to convert those values to tC /ha/year and the biomass with the aim to compare the results with values reported in the scientific literature. From Table 19, the average of tC /ha/year is 28,05. This value is higher than the average value reported by Alongi (2014), 11,1 t C /ha/year, and the range found in Thailand Mangroves 9,35 -12,9 tC/ha (Komiyama 2014). This big difference could be a consequence of the diameter range used (Table in page 49) and due to the biomass estimation outside the range of the Equation, as well as they did not divided by the number of plots with the used equation. This last case leads to assume that old trees have the same biomass accumulation rate than the youngest trees, which is a wrong interpretation.

Comments about estimation of carbon stocks in soils:

The soil carbon accumulation rate used in this PD is overestimated (13,23 tC /ha/year). Why do they assume that the average C stock in those mangroves (640,92 t C /ha) were accumulated in 50 years? The value reported by this study are much higher than default values allowed by the methodology (0,5 tC/ha/year). Likewise, is almost eight times the average value reported by (Alongi 2014) for mangrove ecosystems (1,63 tC/ha/year). Lovelock (2008) found for Australia, Caribbean and New Zeland mangroves a range from 1,51 to 6,34 tC /ha/year (mean 4,10 ± 45 tC /ha/year). Finally, for Pacific and the Indian Ocean, Chmura et al. (2003) reported soil carbon allocation rates between 0,26 tC/ha/year to 3,36 tC/ha/year.

In comparison with estimations made with IPCC default value, the overestimation is 30%. Compared with the estimation made with methodology default vale, the overestimation is 96%.

We consider the presented rate (13,23 tC/ha/year) does not meet the methodology requirement: “The default value of 0,5 tC/ha/year is used, unless the transparent and verifiable information can be provided to justify a different value”.

Comments about baseline:

Differentiating between old and new trees. The differentiation between the existing trees before project start date is necessary. They did not mention that activity in the project description. The inclusion of already existing trees leads to overestimation. The [photos on page 15](#) and [page 27 \(Fig 7\)](#) show the [existence](#) of individuals already established in the baseline.

Pag. 13. The amount of carbon remove due to the preparation activities were not discounted (shrubs: *Acanthus ilicifolius*, *Dalbergia spinosa*).

Pag. 21. The photo shows a high presence of stumps in the planting area. In this kind of baseline, it is possible to plant more than 4000 plants/ha? There is enough space?

Pag. 44. How they classified the different land use types in the baseline? It is not clear.

Pag. 44. “These existing plants are not accounted for the carbon stocks but will be left to grow and are monitored throughout the crediting period of the project activity”: In the monitoring plan, they must describe how they plan to carry out it.

Comments about other issues:

Pag.4. “Mangrove restoration will further increase fish resources with up to 50%”: Source

Pag. 4. “Establishment of the first mangrove gene bank with 64 species be followed with long-term research”: First mangrove gene bank for Myanmar or the Indopacific? They only include in their project the planting of four species. How will they plan to get 64 species?

Pag. 20. The map shows three zones but without explanation.

Pag 30. In the WIF web page there is a strategy to adopt a tree. What kind of certification receive the buyer? It is important to clarify this point to avoid double count.

Pag 30. It is important to monitor the leakage management to include the discount of emission due to the charcoal production displacement. In this section, the PO establish they will monitor this variable, but in the monitoring plan, it was not included.

Pag. 45. Legend and tables in maps are inconsistent.

Pag 46-47. Maps show the project area includes other land uses, which demonstrates that a better delimitation of eligible areas is necessary.

Pag. 65. The final estimations do not reflect the results of the non-permanence risk tool. There is not a discount because of the buffer.

Pag 73- They propose the periodical update of some parameters related to disturbances. They did not describe how to monitor those parameters.

Pag. 76. Explain how the project is going to achieve the increase of family income in 100% during the next 5 five years.

Bibliography

- Alongi DM (2014) Carbon cycling and storage in mangrove forests. *Annual review of marine science* 6:195–219. doi: 10.1146/annurev-marine-010213-135020
- Bayraktarov E, Saunders MI, Abdullah S, et al (2016) The cost and feasibility of marine coastal restoration. *Ecological Applications* 26:1055–1074. doi: 10.1890/15-1077
- Chmura GL, Anisfeld SC, Cahoon DR, Lynch JC (2003) Global carbon sequestration in tidal, saline wetland soils. *Global Biogeochemical Cycles*. doi: 10.1029/2002GB001917
- Komiyama A (2014) Conservation of Mangrove Ecosystems Through the Eyes of a Production Ecologist. *Reviews in Agricultural Science* 2:11–20. doi: 10.7831/ras.2.11
- Lovelock CE (2008) Soil Respiration and Belowground Carbon Allocation in Mangrove Forests. *Ecosystems* 11:342–354. doi: 10.1007/s10021-008-9125-4
- Sukardjo S, Yamada I (1992) Biomass and productivity of a *Rhizophora-mucronata* Lamarck plantation in Tritih, central Java, Indonesia. *Forest Ecology and Management* 49:195–209. doi: 10.1016/0378-1127(92)90135-V