**Appendix S6 - Maximum sustainable yield.**

The concept of maximum sustainable yield in forestry has developed from the management of natural resources, such as fisheries, and involves setting sustainable yield limits that can be achieved over time whilst ensuring that productive capacity of the resource is maintained (Hilborn *et al.* 1995; Luckert & Williamson 2005).

Sustainable harvesting requires more than just a reproductive surplus as methods of wood harvesting can result in: reduction in soil productivity and erosion, deterioration of hydrological functions and damage to surrounding trees, e.g. damage to foliage and branches (Hilborn *et al.* 1995; UNFAO 1998). An annual sustainable harvest rate needs to be applied to the total above-ground biomass (AGB) growth modelled at village level in order to account for these factors. Following Outuoma *et al.* (2011) an annual sustainable harvest rate of 80% was applied to the total AGB growth modelled for the individual villages:

**Annual sustainable harvest rate (kg yr-1) = Total Village AGB growth (kg yr-1) x 0.8**

This equates to an Annual Allowable Cut (AAC) which can be modelled for each village in order to calculate the current sustainability.

To obtain a sustainable harvest rate that is applicable and representative of the above-ground biomass growth in individual villages, data is required on the time trees of varying species take to mature, the regeneration success of trees subsequent to harvesting and the impact of natural disturbances (e.g. wildfires).

Utilisation of an annual allowable cut figure has limitations when used by itself, or if it becomes the overriding objective of forest management (Vanclay 2014). Natural ecological influences impact upon the utility of AAC when implemented as volume control because the long-run average growth may not occur each year (Eneya *et al.* 2004). In years which experience low productivity, use of an AAC will lead to overharvesting (Vanclay 2014). In addition, the setting of AAC values assumes that demand for wood remains constant.

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