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Soil fertility management for reclamation of *Imperata* grasslands by smallholder agroforestry

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Abstract. *Imperata cylindrica* grasslands are widely believed to indicate poor soil fertility. Soil fertility improvement may have to be an important component of a reclamation strategy. Data for Sumatra, Indonesia indicate, however, that *Imperata* occurs on a broad range of soil types and is not confined to the poorest soils. A direct role of *Imperata* in soil degradation cannot be ascertained. In many instances, however, *Imperata* soils are low in available P and effective N supply. The use of rock phosphate in combination with erosion control ('fertility traps') and legume cover crops can be effective in restoring soil fertility. Case studies for a number of sites in Sumatra have confirmed the practical possibility of reclaiming grasslands for food and tree crops.

Introduction

Imperata grasslands cover large areas in Southeast Asia, but are far from uniform in soil type and the soil-related constraints to alternative land use systems. Three contrasting points of view on *Imperata* are:

- a) *Imperata* is a weed which is difficult to eradicate and which causes large land areas with considerable potential for other land uses to remain under-utilized; *Imperata* control should be the first and major step of a reclamation effort; once *Imperata* is eradicated, the land can be used profitably;
- b) *Imperata* is hardly a problem weed by itself but simply an indicator of poor, degraded soils. Hence *Imperata* reclamation without improving soil fertility does not solve the problem. When essential nutrient shortages, such as P deficiency are addressed, other land uses will be possible and other plants will outcompete *Imperata*;
- c) *Imperata*, especially when frequently burnt, is itself a cause of soil degradation

We will refer to these points of view as the 'trouble weed', the 'poor soil indicator' and 'soil degrader' hypotheses, respectively. Although the three hypotheses indicate different entry points for reclamation, they are not mutually exclusive and hybrid strategies may be needed, addressing both the