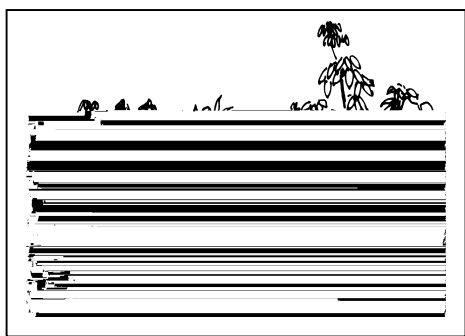


***Imperata* Grassland Rehabilitation using Agroforestry and Assisted Natural Regeneration**

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Introduction

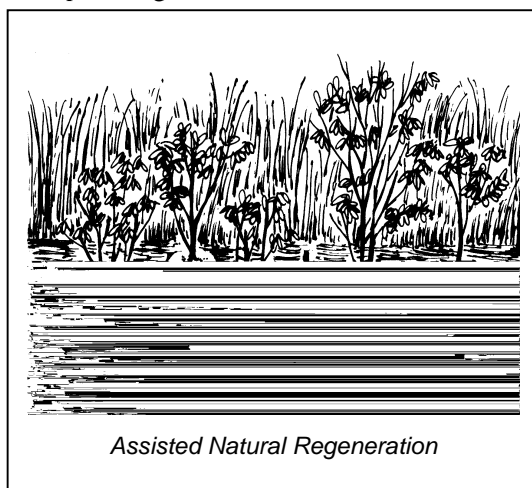
Imperata cylindrica grasslands are found throughout Southeast Asia. They are perpetuated by *Imperata's* ability to resprout quickly after fire. Fire is the main reason that tree plantations fail on *Imperata* grasslands. Local people may be the cause of fire, but they are also the best partners to prevent it. They rehabilitate *Imperata* grassland rehabilitation when they own the trees and crops that will replace *Imperata*. The more valuable the new land use is to local people, the harder they will work to maintain it and prevent fire.

This manual is written to benefit people who live in an environment dominated by *Imperata* and who want to replace grasslands with agroforestry and forests. The techniques covered in this manual are most useful for medium-sized grasslands, confined to one village or community. The manual's content and format is designed for extensionists, agriculturists, foresters, development workers, and others who can assist communities and smallholders to design and implement *Imperata* rehabilitation activities.



Agroforestry practices involve a close association of trees and shrubs with crops, animals, or pastures. The combination of species often uses growing space more fully than simple tree plantations, creating more shade and reducing the growth of grass. A community of small landholders can implement intensive and complex agroforestry systems over a large area, thus rehabilitating large grasslands. This manual covers how to establish agroforestry in *Imperata* grasslands, but it is not a complete textbook on agroforestry. Extensionists are encouraged to get additional information on specific agroforestry systems and crops.

Assisted Natural Regeneration (ANR) stimulates the growth of natural saplings and seedlings. Regeneration is assisted by fire suppression, weed control, and attracting wildlife that spread seeds.



ANR may include enrichment planting. On appropriate sites, forest cover can be re-established more quickly and cheaply with ANR than with conventional reforestation. ANR has often been implemented in partnership with local communities, making use of local knowledge and species preferences, and granting tenure of land or products. This manual contains an introductory field guide for ANR.

Readers of this manual should also have a copy of *Imperata Management for Smallholders*⁵. It provides information on cultivation and herbicides to control *Imperata* as a weed within individual farms. See Appendix A for this and other recommended references with more detailed information on specific topics.

⁵ *Imperata Management for Smallholders, An Extensionist's Guide to Rational Imperata Management for Smallholders*. 1996. Indonesian Rubber Research Institute, Sembawa Research Station, Indonesia; Natural Resources Institute, UK; and International Centre for Research in Agroforestry. 56 p.

Chapter 1

Imperata and People

1.1 Why rehabilitate *Imperata* grasslands?

The most convincing reason to rehabilitate *Imperata* grassland is to make the land more economically productive. However, existing *Imperata* grasslands are not "wastelands." There are usually land claims and existing land uses by local people, like grazing and shifting agriculture. These uses are important to the people who depend on them, even if they don't generate much cash income. Rehabilitation of *Imperata* grasslands will be attractive to local people only if they believe the new land use increases their production or income. Governments can support local farmers through policies and programs that reduce risks, reduce costs, and increase the profitability of agroforestry and assisted natural regeneration. Such policies and programs combine *Imperata* grassland rehabilitation with poverty alleviation.



Imperata grassland rehabilitation depends on fire control. Fire control depends upon local people. Too often, *Imperata* grassland rehabilitation projects are planned by outsiders without asking “Why?” from the perspective of the local people. If people do not agree with a project’s goals, fire will probably not be controlled and the rehabilitation will fail.

Environmental reasons alone seldom justify the conversion of grasslands. *Imperata* can be a better watershed cover than land uses that disturb the soil. If *Imperata* is not grazed or plowed, its thick mat of rhizomes near the soil surface minimizes erosion. Reforestation is very expensive to carry out over large areas; it must be justified economically as well as environmentally.

1.2 Conditions required for grassland rehabilitation

Imperata grassland rehabilitation can succeed only when three critical conditions are met. There are many examples of *Imperata* grasslands being rehabilitated without outside assistance when all three conditions were in place!

1. **People who rehabilitate *Imperata* grasslands must have clear and secure tree or land tenure.** People are directly motivated to plant and protect trees and crops if they have clear use rights or ownership. Most *Imperata* grasslands already have local uses and local claims. Land tenure is neither clear nor secure if there is a conflict between local people who were already using the land and people trying to convert *Imperata* grasslands. Also, land use tenure is not secure if it is based on project requirements that the land user thinks are not practical or appropriate. The land holder should be free to choose land use.
2. **Transportation and access to markets must be adequate.** Many *Imperata*-dominated areas are remote, and may remain in *Imperata* for that reason. Agroforestry and assisted natural regeneration will become more feasible if access is improved for implementation, protection, and marketing. Roads allow fertilizer to be brought in and produce to be taken out. What transportation is adequate depends upon where landusers live and what crops are grown.

3. **Local communities must cooperate in fire prevention and take the lead in fire control.** Local people are familiar with local conditions and fire risks; they are likely to be the first to know when a fire starts, and can take timely actions to extinguish fires while they are still small. They may also have reasons to deliberately burn. They are only likely to cooperate in fire prevention if they have secure tenure and access.

Development activities may be able to help put these conditions in place by building roads, creating markets, or providing legal tenure to local people. Extension agents may train people in fire control, or help communities improve access to markets by providing market information or organizing cooperatives.

1.3 Working with people and Imperata

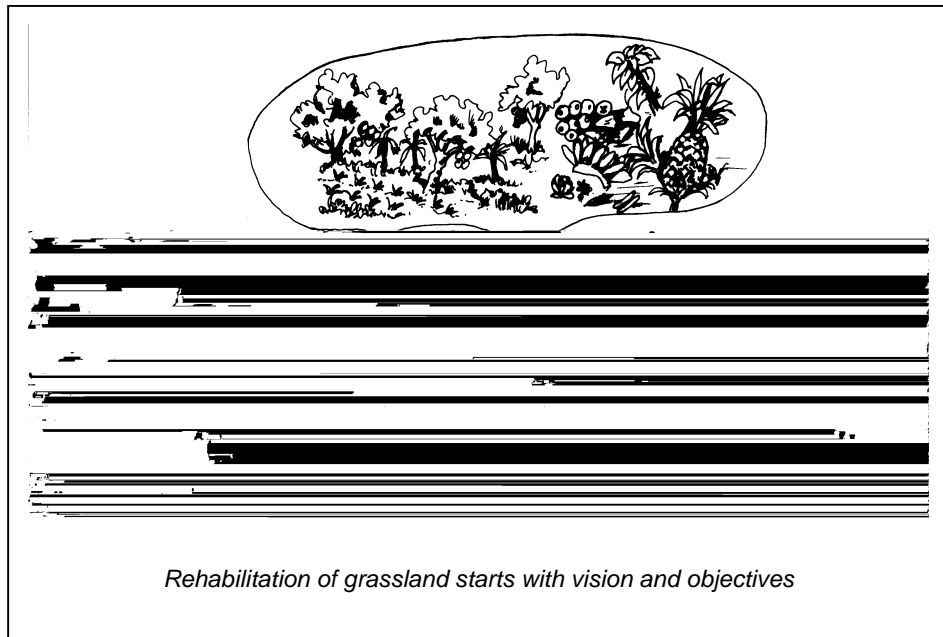
Community development should begin with local community objectives. However, national or regional governments or programs often have objectives for *Imperata* rehabilitation that are combined with watershed restoration, resettlement, or economic development. These regional objectives may complement local community objectives, or they may be in conflict with them. Conflicting objectives usually cannot be resolved by just educating the community, but require dialog and respectful negotiation.

Project managers and extension agents serve both regional programs and local communities. They can help communities to explain their needs to programs and governments. They can try to adjust outside assistance to meet the objectives of local communities as much as possible. Or, they can choose only communities that are good matches for the development activities.

1.3.1 Role of the extensionist

Extensionists are the critical link in the chain between farmers and research institutions, development organizations, and government offices. Especially in *Imperata* grassland rehabilitation, the extensionist should not just give farmers technical instructions. **An effective extensionist...**

...listens and learns. Often, only local people can explain the history of an *Imperata* grassland and what land claims and land uses exist.



...is sensitive. Farmers have constraints and limitations, like insecure tenure or lack of resources. These constraints may keep them from carrying out recommended activities. Their reluctance may be perfectly rational. It may be the recommendations that need to be changed.

...recognizes farmers' abilities. Farmers are often creative experimenters. The extensionist should encourage them to establish small trials of variations on technical recommendations. Farmers with small plots can manage their land in a more complex way than large plantations. They can select and plant a mixture of multipurpose trees or specialty crops that grow in specific microsites or planting spaces. Such intensive development of the land leaves less *Imperata* as a fire hazard.

...helps the community with its objectives. The extensionist's work should serve community needs and objectives. In addition, short-term help

with even small or unrelated objectives will build the community support and trust needed to address long-term or regional objectives.

...enables and empowers the community. Within the community, the extensionist should encourage self-help groups to develop cooperation and leadership in the community. The community should be prepared to continue its activities even if the extensionist or outside funding leaves. Communities in *Imperata*-dominated areas are often remote and isolated. The extensionist can help overcome this isolation by introducing community leaders to government agencies and other sources of long-term assistance.

...is patient and has a sense of humor!

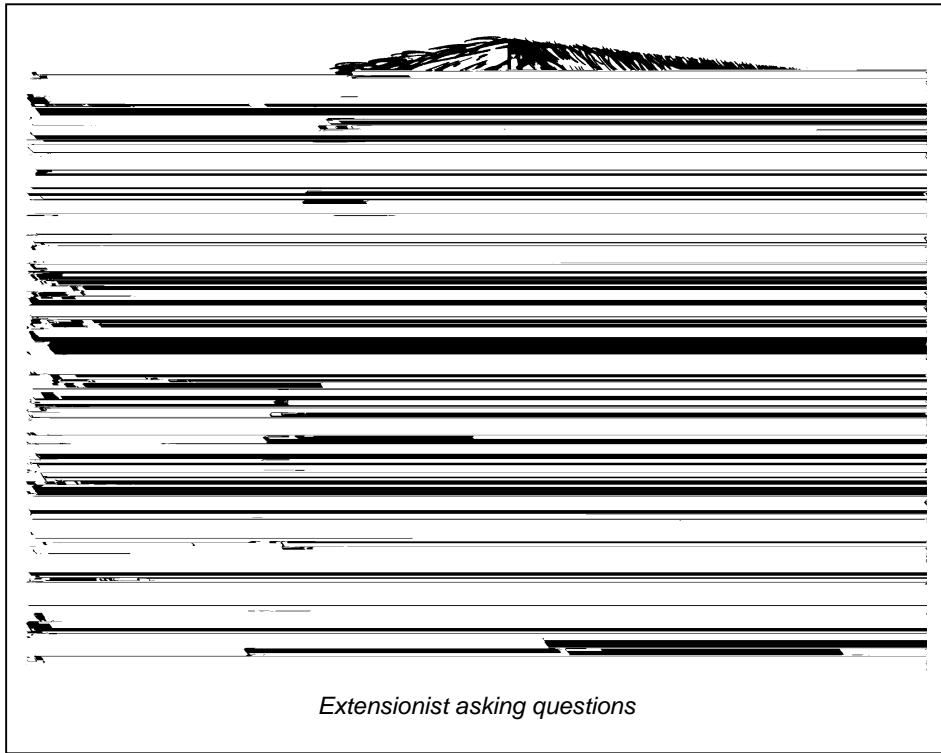
1.3.2 Community perspectives

Before launching any activities in *Imperata* grassland rehabilitation, outside facilitators should understand community perspectives on all ways that *Imperata* and alternative land uses affect the community. Talk to people representing all those groups potentially affected: men and women, people from various villages, people of all ethnic groups, rich and poor, young and old, long-settled residents and recent migrants, landowners and those owning no land. Often it is the least prominent people who are most dependent on forest and grassland resources.

Cover the following topics:

1. **History of the grasslands.** When did these grasslands come into being? How have they been used in the past? Have they been continuously maintained as grasslands?
2. **Use of *Imperata* and *Imperata* grasslands.** Is *Imperata* used for thatch, medicine, rituals, fodder, or other things? Are *Imperata* grasslands used for shifting agriculture, hunting grounds, pasture, or thatch production? Are there people who depend upon the *Imperata* resource for jobs? (For example, people may earn money by plowing *Imperata* fields, or by thatching roofs.)

3. **Changes in *Imperata* grassland use.** Can community elders remember these uses having changed during their lives? How has *Imperata* use been affected by changes in population, markets, technology, government pressure, or other events?



4. **Rules for grassland use rights.** What are the current laws, regulations, and local customs controlling use rights for these grasslands? How have these rules changed or evolved from past traditions? How might an *Imperata* grassland rehabilitation effort change these rules, for example by changing land tenure or use rights?
5. **Differences within the community.** Who uses *Imperata*? Who claims *Imperata* grasslands? Are there differences between how different groups (ethnic groups, men/women, old/young, rich/poor,

etc.) use or own it? How would changes brought about by *Imperata* grassland rehabilitation affect these groups?

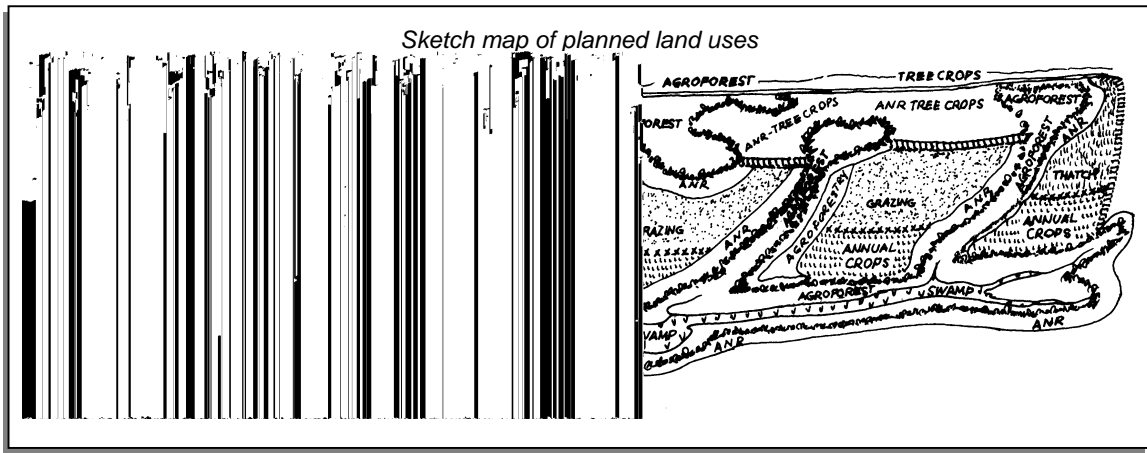
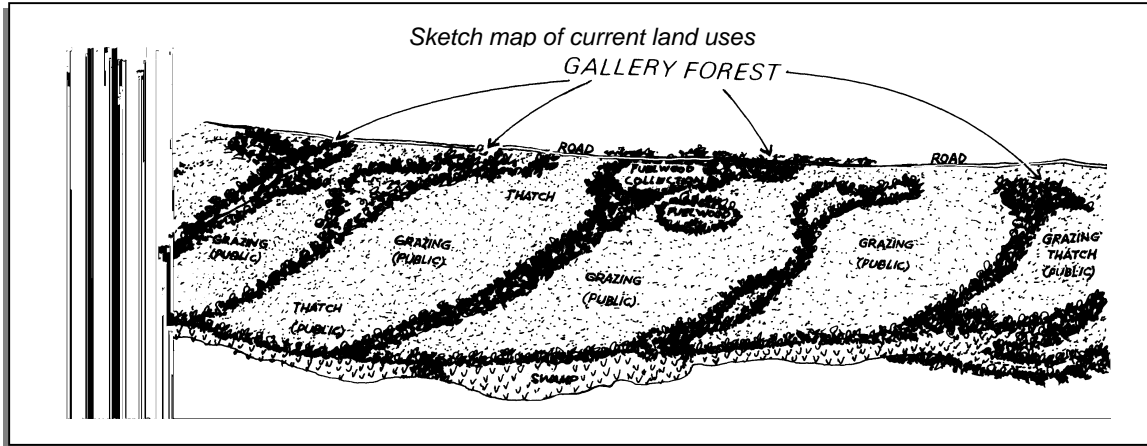
6. **Local value of *Imperata*.** Do local people value *Imperata* and *Imperata* grasslands? How does that value compare with the value of forest, forest plantations, other secondary vegetation, agroforestry and crops? Where do farmers prefer to plant their crops?
7. **Productivity and environmental sustainability.** Are current land use practices productive? Do they cause environmental problems? Will they continue to be productive in the long term? Do local farming practices affect primary forest, old fallows, or grasslands? Is soil erosion significant? Does the threat of fire prevent investment in valuable crops?
8. **Farmers' objectives.** What are the farmers' plans or suggestions for improvement of the *Imperata* grasslands or of their farming practices? What changes do they think would benefit their households or the community?
9. **Agroforestry or Assisted Natural Regeneration.** Can agroforestry or ANR make the improvements suggested? What kind of agroforestry or ANR practices? What species of trees, shrubs or crops do farmers want to plant?

1.3.3 Community mapping and planning

Encourage local people to engage in a participative exercise to make maps of the community and prospective land uses. This encourages sharing of information and discussing objectives. The maps become a focus around which the community begins to make decisions and plans.

Start with a map or maps describing the current situation:

Land ownership and claims. Map any large claims on forest and agricultural areas. Elicit detailed information about claims on *Imperata* grasslands.



Existing vegetation types. Map the large areas of primary forest, secondary forest, agroforestry, and agriculture in the community. Pay particular attention to mapping the different kinds of *Imperata* grasslands: pure *Imperata*, *Imperata* with scattered shrubs and patches of forest, *Imperata* areas with scattered agricultural activities, sparse *Imperata* on poor soil, etc.

Land use. Show detailed information on the various uses of *Imperata* grasslands, for example, agricultural fallow, hunting, and grazing.

Special features. Include roads, streams, springs, hills, valleys, and other natural landmarks.

Mark a copy of the map to show plans for future land use:

Sites where current uses will continue: for example, forest, agroforestry, agriculture.

Sites to remain in *Imperata*, for various reasons:

- *Imperata* grasslands that the community wants to retain, for hunting, grazing, or thatch. *Imperata* might be an important source of forage for local communities' cattle and water buffalo.
- *Imperata* grasslands that are so remote, fire-prone or infertile that it is not worth trying to rehabilitate them in the near future.

Sites for conversion from *Imperata* to other land uses. Identify the planned land uses, depending on characteristics of the site and the priorities of the community:

- agriculture
- agroforestry
- assisted natural regeneration
- tree plantations
- improved forage

Improvements planned, especially buildings, roads, trails and water projects.

The community may identify only a small area of land for *Imperata* grassland rehabilitation. This may suggest that rehabilitation is not perceived to be a priority and that the community may be better served by other efforts. Perhaps more land would be desired for rehabilitation if there were better market access or more secure land tenure. Or, perhaps the community has a “wait and see” attitude, and success with a small area will motivate people to try more later.