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# TREES OUTSIDE FOREST

## *in Asian Rice Production Landscapes*

**At global level, trees outside forest represent a significant tree resource whose management concerns a very wide range of stakeholders, but as yet has not been well recognized or addressed in policy considerations.**

*Trees outside forest* (TOF) are defined by FAO as all trees and shrubs that cannot be included in the “Forest” nor in the “Other Wooded Lands” categories of FAO forest classification. All trees encountered on agricultural or urban lands, regardless of tree cover extension, are therefore TOF. It is now widely recognized that TOF generate many benefits from environmental, social and economic perspectives. When well-integrated and managed in agroecosystems landscapes they contribute to sustain livelihoods, alleviate poverty, and promote

- productive and resilient agricultural environments by:
- ✦ providing food, fodder and fibre, as well as medicines and woodfuel;
  - ✦ incrementing soil productivity and resilience;
  - ✦ supporting animal production;
  - ✦ protecting soils against erosion and drought;
  - ✦ generating incomes and jobs;
  - ✦ buffering from increasing temperature;
  - ✦ incrementing adaptability to flexible market demands;
  - ✦ regulating water level;
  - ✦ sequestering and storing carbon.



## TREES AND RICE: CHANGING PARADIGMS AND PROMOTING INTEGRATION

Rice production systems are facing multiple stressors such as climate change, land degradation, and water scarcity, which put the region's food security at risk. Although trees and rice production are often seen as incompatible, maintaining an adequate tree cover and integrating trees and crop in rice production landscapes (i.e. agroforestry practices) can provide multiple services that contribute to mitigating such stressors.

Planning investments and designing interventions to increase trees' contribution to livelihoods and to agricultural sustainability in rice production areas requires a comprehensive assessment of TOF including data on: tree location, tree contribution to livelihoods, tree economic, social, cultural and environmental value. This requires availability of reliable guidelines and cost-effective assessment methodology, as well as capacity to conduct such assessment and to effectively translate its results into action.

### TOF in rice production landscapes in Asia

TOF in rice production landscapes in Asia are important for soil stabilization, erosion control, carbon sequestration and storage, shade provision, water level regulation, provision of food, woodfuel, timber and poles. They can be found in homegardens, along roads and streams, in agroforestry systems, in small woodlands, along hedges, in fallows.

Presence, distribution and role of trees found in rice production landscapes mainly depend on topography, method of irrigation and permanence of the rice system:

- ✦ Irrigated rice fields on terraces in mountainous areas: TOF are usually abundant in homegardens, along roads and streams, in various kinds of agroforestry systems, in small woodlands .
- ✦ Irrigated rice fields in large flat plains: TOF are generally rare and mainly present in homegardens, along roads and streams.
- ✦ Rainfed permanent rice fields: TOF are abundant but occur mainly in hedges or scattered in crop fields.
- ✦ Rainfed shifting cultivation systems: TOF are very abundant in fallows.

### PILOT PROJECT ACTIVITIES

In the framework of the pilot Regional Rice Initiative for Asia, Phase I, FAO designed a project aimed to develop TOF assessment capacities in rice production landscapes in Asia through training on and adapting of an innovative methodology recently developed by FAO to quantify and qualify the tree cover at landscape level. The methodology proposed uses a remote sensing analysis conducted

on easily accessible and free maps, requires minimal training, and software can be applied in any site. It consists in:

1. **Mapping and quantifying TOF cover:** after a basic preliminary assessment conducted on a map of the site, points/areas of uncertainty are checked on the field to produce a final refined map that allow to quantify the different land-uses and tree cover categories.
2. **Conduct Focus Groups:** interviews with farmers are conducted to collect further information on the site, on the most common tree species present, and on the economic, social, cultural and environmental importance of the tree vegetation, as perceived by farmers.

Through the development of field studies, three national GIS/forestry experts (from Indonesia, Lao PDR, Philippines) have been trained to conduct a TOF assessments in a rice production pilot site identified in their own countries.



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## RESULTS

### INDONESIA

In the Indonesian pilot site located in “irrigated rice fields in mountainous areas”, erosion control and stream water regulation are two crucial issues for the productivity and sustainability of paddy fields. TOF in agroforest systems and homegardens thus increase sustainability of rice fields production, provide a wide range of products for home consumption (coconut, fruits, timber, woodfuel), cattle feed, and religious purpose, and are consequently protected and managed. TOF importance is well known by the inhabitants of the site and is reflected by the very large area it covers.

### PHILIPPINES

In the Philippines pilot site, also located in “irrigated rice fields in mountainous areas”, trees are mainly present as dense Forest canopy. On average, half of the landholdings consists of forests planted with indigenous species and managed by households as primary source of firewood, carving material, lumber, source of food, medicines, fertilizer, as well as for religious purposes. Forest cover is recognized by farmers as an important to their rice fields’ health, protecting against erosion and regulating the stream water level.

### LAO PDR

The Lao PDR pilot site is on the other land located on “irrigated rice in flat plains”, characterized by a relatively flat plateau with small scattered hills. The landscape is dominated by paddy fields and very large areas of pasture. The scattered hills are usually covered by forests, which ensure the same protective (soil) and regulatory (stream water level) functions as in the two other sites. As in the Philippines, TOF appear to have a minor role in the landscape.



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## OUTCOMES

- ✦ Although differences between the three sites have been recorded, the study conducted has undoubtedly confirmed farmers’ awareness about the relevance that trees have in erosion control and stream water regulation in rice production landscapes, as well as in income generation and provision of food for home consumption.
- ✦ The methodology adopted has proven to be efficient, cost effective, and was relatively easily implemented.



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## WAY FORWARD

The current pilot project has undoubtedly yielded important lessons and paved the way for several follow-up activities to be proposed for the next biennium.

TOF assessments have proven to provide reliable results. Promoting TOF assessments at watershed and landscape scale would yield meaningful results useful for policy making and land-use planning. Based on the outcomes of the present project, a Guide for assessing TOF in rice production landscapes in Asia is being developed by FAO and will serve as a reference tool for replicating and up-scaling the present study at national and regional level.

Not only have the benefits of TOF in rice production landscape been demonstrated, but farmers' awareness of the importance of integrating trees in rice production landscapes was also widely documented. These results should encourage governments to promote trees presence and agroforestry practices in these kinds of crop systems. At national level, the Agroforestry Guidelines developed by FAO are a useful guide to support adoption of enabling conditions for agroforestry's development. Furthermore, assessing the availability of agroforestry planting material, providing information on how to access such material and developing catalogues of trees suitable for each of the different rice growing situations could provide practical tools and guidelines for implementation of agroforestry practices in rice production landscapes in Asia.



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