

## In Malawi, combining economic and environmental issues in a context highly exposed to climatic hazards.



In the central and southern part of Malawi, the rural population density is very high, often higher than 300 inhabitants/km<sup>2</sup>) and highly exposed to frequent and intense climatic hazard. This situation combined with a low fertility of the arable lands, impoverished by repeated unsustainable agricultural practices, place families in a permanent crisis situation. This pressure on the environment is also responsible for the gradual disappearance of the trees cover, with dramatic consequences: the last trees on the farms (mango trees) are cut down mainly to sell the wood for burning bricks for house construction, the firewood resource are depleted, increasing the distances and time spent to collect fuel materials, and the proportion of the household budget spent on buying fuelwood is drastically increasing.

We have been able to measure that a rural family living in the intervention areas needs the equivalent of 30 to 40 median-age clear-cut trees per year to meet its needs, while it only has an average of 20 trees on its farm, in a village landscape that is being increasingly deserted. In these circumstances, many households are forced to buy wood from outside, or to adopt other strategies and end up burning crop residues for a significant part of the year, which are then no longer used to maintain the soil fertility in the fields.



For over 10 years, Inter Aide has been developing in Malawi a solid expertise in the support of village groups for the setting up of community tree nurseries, allowing a consequent production of quality tree plants, and in the support/advice regarding tree planting. However, in order to achieve significant improvements on the scale of these territories, it is essential that all households take responsibility for the reforestation of their farms, and this requires several conditions to be met:



### 1. To have a suitable model for individual wood production, in a dry environment with a limited amount of space available for planting trees

With less than one hectare available per family, the land tenure context in Malawi makes tree planting in woodlots particularly difficult. The number of trees being planted is generally limited, with plantings often scattered, and it is not obvious to families how to increase their own wood production. There are also few opportunities for collective plots as the last remaining village communal areas are often narrow and kept for pasture. Families are generally unmotivated to initiate reforestation efforts there.

Nowadays, the bocage pattern is almost completely absent from the landscapes of these savannah areas. However, with a potential of around 400 trees at the edge of a cultivated hectare, divided into 2 to 3 separate plots, the space available in the boundaries of agricultural plots is a privileged place to plant a large number of trees and to improve the conditions of the environment in the long term by using appropriate pruning practices. By examining and adapting several farmers' innovations, Inter Aide has progressively developed a simple and sustainable model of fuelwood production by pruning the *Senna spectabilis* species planted in hedges around the agricultural plots. From the 4<sup>th</sup> year after planting, these trees can be pruned or coppiced every year or two, allowing a regular production of several kilograms of wood per tree, without having to cut them down. Other leguminous species, such as *Acacia polyantha* and *Albizia lebbek*, can be used in a similar way. These methods are very appropriate to the context, including for families in more precarious conditions, and the experience acquired by our teams now enables us to help families to better anticipate some possible difficulties: pitting work to be started way ahead before planting, especially in areas far from home, obtaining prior agreement from neighbours to prevent land conflicts at the edge of the property, and paying attention to the management of young plants in order to optimise the survival rate.



In this situation, the integration of agroforestry practices is essential to improve families' access to wood resources, diversify their income through the sale of wood and non-wood forest products and preserve biodiversity and the balance of agrarian systems.

## 2. Stimulate the interest of as many families as possible in planting trees by highlighting the economic and environmental potential

Despite the efforts of our teams to make communities aware of the strong connection between the tree's role and environmental and fertility problems, a large proportion of families, for whom the priority is first and foremost to cover immediate basic needs, did not involve themselves much in tree planting.

By examining more carefully the wood needs of the families and the technical possibilities for producing firewood on their farms, we were able to better understand and explain the economic benefits of these agroforestry alternatives and their potential to improve their living conditions. On this basis, suitable pedagogical approaches have been developed, highlighting the importance of pruning practices and the economic potential over time, according to the age and the use made (firewood, poles or timber for construction, ...).

At the same time, the organisation of exchange visits with farmers who have built up a significant production system, using hedges, has helped to stimulate the families' interest in the benefits and income generated by these new practices.



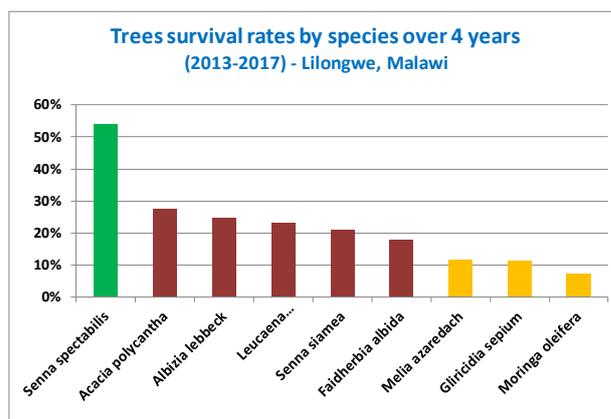
## 3. Finding appropriate techniques and species to improve survival rates in a context that is not optimal to young trees

A key obstacle to reforestation in the target areas is the particularly long dry season of 7 to 8 months, during which rainfall is completely absent. The young seedlings therefore develop very slowly, unlike in other tropical regions where we work, with generally a short intermediate rainy season that allows the seedlings to regain their vigour in the middle of the year.

In addition, there are many other factors that affect the survival of young plants. Between 2013 and 2017, we carried out a study to continuously measure survival rates for different species, which allowed us to better understand and take these factors into account.

They mainly concern :

- the choice of species more appropriate to the context (drought resistance, species with a low appetite index in areas exposed to goat grazing, etc.). For example, *Senna spectabilis* is a particularly suitable species for planting agroforestry bocages and is extremely well adapted to regular pruning. This species also shows a much higher survival rate than the others, mainly due to the fact that it is not edible by goats. While promoting a very high degree of diversification (about twenty different species recommended), the project has therefore encouraged to increase the proportion of the best-performing species in the nurseries, such as *Senna spectabilis*, *Acacia polykantha* or *Albizia lebbeck*.
- the planting schedule (planting at the right time to ensure the optimal development of the plants during the short rainy season)
- the protection and location of plantations (protect trees from being damaged by goats; encourage the planting of hedges and the clustering of seedlings so that workers can see the planting patterns)
- the development of back-up watering systems when there is a period of several weeks of dryness in the rainy season,



## Challenges and prospects

Inter Aide has now a more robust technical approach, both in terms of nurseries and plantations. The results obtained over the past few years show an encouraging dynamic at the level of the supported villages, with the emergence of a growing number of families convinced by the economic benefits of wood production, and therefore able to convince their peers. The current challenge is both to experiment methods that would enable more ambitious changes regarding the number of families targeted and the number of trees planted, and at the same time to look at the lower part of the value chain to assist families in maximising the income from individual plantations and to remove some of the obstacles to commercialisation (transport, market access, price negotiation, etc.).

### a. The search for a suitable scaling-up project device

Until mid-2020, tree-planting actions were part of a wider agricultural support programme. The strategy made it possible to reach between 30 and 50% of the families in the targeted villages, but it was more difficult to motivate families in a very precarious situation, for whom the purchase of wood represents a heavy expense. To make more significant improvements, we decided to launch an action specifically focused on agroforestry and concentrated within a smaller area, with the aim of achieving a more visible and convincing landscape impact from a scaling-up perspective. The challenge is therefore to test mechanisms to reach almost all the households living in these villages, in particular through volunteer farmers playing a training role with their peers. To do so, the teams can rely on a simple technical approach that can be easily mastered by the communities, allowing them to work with more households of the same size, while maintaining high quality results.



### b. Understanding better the current functioning of the local wood/energy chain, the potential for family farmers, and conditions for integrating women into the value chain

Located near natural forest reserves that are experiencing illegal deforestation and about fifty kilometres from the main urban centres, the forest resources in the intervention areas are exploited to ensure the supply of wood energy to the urban population, in addition to the harvesting by the rural population. In this context, understanding the functioning of the fuelwood sector and the dynamics within these areas seems to be essential in order to seek appropriate marketing strategies with families actively engaged in fuelwood production. This line of work will also address the "gender" aspect, since, although women are in the front line for the local collection of firewood, they remain largely excluded from the marketing aspects.

