

# Exploiting the value of *Prosopis* for dryland forestry and agroforestry systems

*A briefing paper for agencies concerned with international research and development*

## The global problem

Intensive land use systems in the humid tropics and temperate regions are approaching limits of sustainable production, if they haven't passed them already. Demand for food, fibre and other raw materials continues to rise, and must do so if we are to achieve goals of improved livelihoods for all. All this, while a third of the world's land area is under-utilised desert, often degraded, and generally of low and variable productivity. It attracts little inward investment, and the ten percent of humanity who live there contain a disproportionate number of the world's poorest people.

## *Prosopis* – tree of the desert, tree of the poor

Among the most valuable resources in the drylands of the world are trees. *Prosopis* and *Acacia* are by far the most widespread species. In the hot arid and semi-arid zones of the world, *Prosopis juliflora* and related species are now probably the most common trees, having been introduced for fuel and fodder in the last two centuries. They are generally unmanaged but the main source of firewood for local populations. In the native range Americas, many rural economies rely on *Prosopis* to supply a growing trade in processed goods. Where introduced, such multiple uses are little known, and certain tree species have become invasive weeds. The tree has been introduced, but the indigenous knowledge surrounding its wise management and use has not!

## Not just firewood and fodder, *Prosopis* is a source of valuable raw materials

Larger branches and trunks yield a high quality timber, comparable in colour and finish to Indian rosewood and other commercial hardwoods, and with excellent physical attributes. While also used for posts and poles, the wood, called 'wooden anthracite' in some areas, is almost unsurpassable as a fuel. Fruit pods are high in sugar and protein and are readily eaten by animals. They can be used in human food but only a fraction of the total yield is ever used. *Prosopis* honey is of the highest



*Prosopis* leaves and pods

quality, exudate gum is comparable to gum arabic, and there are many other uses. All *Prosopis* products have added value if processed, for example with at least a 30-fold increase by turning firewood to finished timber, more if manufactured into furniture.

## Collating global knowledge on important *Prosopis* species

A recent DFID-funded project collated knowledge on the most common *Prosopis* species into a scientific monograph, a technical extension manual, and a reference database. The monograph details the problems and potential benefits, and identifies four major constraints to further development of *Prosopis juliflora* and *Prosopis pallida* in the hot drylands, which will require international, multi-sectoral approaches if they are to be overcome.

# Making *Prosopis* a part of the solution to problems of desert development

## (1) Use of improved genetic material



National and international agencies involved in conservation and utilisation of forest genetic resources should support a range-wide collection of seed, herbarium material, pods and wood of *P. juliflora* and *P. pallida*, and identify and make available material considered elite in terms of pod and timber quality, form and few thorns.

### Conservation of remnant *Prosopis* woodlands in Peru

Peru's coast was once a *Prosopis* forest. Over-exploited for centuries, charcoal cutters are now threatening the last few woodlands, some containing trees over a thousand years old. There is an urgent need to protect these vestige *Prosopis* woodlands, as a part of Peru's history and as valuable genetic resources for the world, as Peruvian *Prosopis* has been shown to out-perform other species in field trials worldwide.

Photo: Native *Prosopis* tree, Peru

## (2) Application of improved management interventions



National governments should end eradication programmes and divert funding to controlling *Prosopis* by improved management; through the development of integrated agroforestry land use systems, and evaluation of the effects of selected interventions on yields, economic viability and the environment.

### Management by exploitation, not eradication, required to control *Prosopis* weedy invasion

*Prosopis* species are declared noxious weeds in Argentina, Australia, India, Niger, Pakistan, South Africa, Sudan and the USA, where they form impenetrable thickets. Millions of dollars are spent annually around the world on eradication programmes, but the problem remains. Integrated programmes involving biological control show promise, but long-term management will still be required and systems have now been developed to convert invasions into sustainable agroforestry systems. These systems produce multiple products, appear profitable, and now require adapting to local conditions.

Photo: Managing weedy thickets

## (3) Development and application of processing technologies



Promote collaboration between industry and research and development organisations, leading to:

- ergonomic, technical and economic improvement in pod and timber processing;
- technologies for processing tree products adapted for village-scale use;
- high-technology solutions for extraction of high-value substances from plant parts.

### Potential for commercial timber production from arid and semi-arid zones

An economic and technical evaluation of available timber species (*Prosopis*, *Acacia* and others), wood quality, local and international markets, appropriate processing technologies, and full commodity chain analysis are required.

Photo: *Prosopis* furniture

## (4) Commercialisation of *Prosopis* tree products



- Develop / extend standards for *Prosopis* timber, pod flour and gums so as to be internationally recognised.
- Promote *Prosopis* as low-cost raw material producing high-value products with local processing.
- Identify 'niche' export markets, promote through trade fairs, conduct local surveys.

### Timber standards

A standard for *P. glandulosa* wood was approved by the US National Hardwood Lumber Association in 1993 that allows for short boards and some defects found in this species. This could be used as a basis for an internationally agreed standard for timber of all *Prosopis* species.



Photos: above left, *Prosopis* pod products, left, *Prosopis* timber

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