

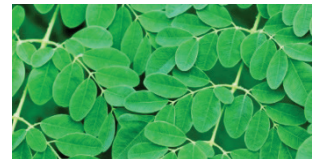
FEED THE FUTURE INNOVATION LAB FOR LIVESTOCK SYSTEMS

EXAMPLES OF LIVING FENCES IN CAMBODIA

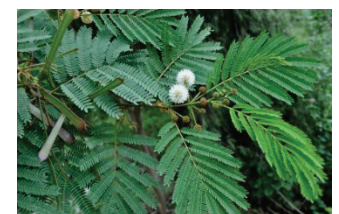
This document provides some examples of living fences in Cambodia. A living fence is a fence made of living trees, shrubs or other plants. Varieties of trees and shrubs, including some legumes, are well adapted to the monsoonal environments of Cambodia and can be planted as live fencing. Living fence species have multiple, widely documented benefits for farming systems including: the conservation of forest resources; the provision of woody biomass for fuel; reduction in the long-term maintenance costs of fencing; wildlife habitat provision that promotes biodiversity; and windbreaks.

However, two of the most important potential benefits of living fences in smallholder systems in Cambodia are the provision of perennial livestock feed sources and the protection of land from roaming livestock. This document provides examples of four nutritious living fence species (*Moringa oleifera*, *Leucaena leucocephala*, *Gliricidia sepium*, and *Acacia penata*) that are well-suited to Cambodian systems.

1. *Moringa oleifera* is sometimes referred to as the drumstick tree. This tree is known for its nutritional benefits for humans. It grows quickly, is drought tolerant, and can be planted in dense rows as living fences. *Moringa* can be harvested regularly for the high protein content in the leaves. The photos below show a living fence of *Moringa*. These trees were planted 50cm apart. After growing to the height of 3 meters, they were cut to the height of 1.5 meters for a fence. Bamboo was attached to the trees as a trellis. Additional plants were planted near the trellis (Malabar Spinach) so they could climb the trellis and produce additional nutrition. Both of these plants are regularly harvested for human consumption. This is an example of how multiple nutritious species can be produced in very little horizontal space while providing fencing.



2. *Leucaena leucocephala* can be found in Anlong Thmey village. A row of trees were densely planted along one side of a paddy field. This species is also a fast growing tree and can be cut regularly for cattle fodder. The high levels of protein in the leaves (~25%) can provide additional fodder throughout the year. The photos below show the fence after it was recently cut and the same fence two weeks later with young shoots that can be used as nutritious fodder. The cut branches can also be used as firewood.





3. *Gliricidia sepium* planted in Battambang Province. *Gliricidia* is a nutritious fodder for livestock. Like the other species, it grows quickly. The benefit of *Gliricidia* is that it can be planted by cuttings of up to 1 meter. This makes the establishment of a living fence much faster. The photos below show the planting of *Gliricidia* cuttings in the village as well the trees after they are established.



4. *Acacia penata* (also known as Climbing Wattle) is planted in Anlong Thmey village. This thorny species is useful as a livestock barrier. It is also a useful plant for human nutrition as it contains high levels of vitamin A. Climbing Wattle can be shaped and directed as it grows. The photos below show examples of Climbing Wattle fences as they are growing, and after they are grown and tied as a fence. The first photo shows a student talking to a farmer next to the living fence. The tips of the fresh growth are harvested, and the branches will then be bent and tied into a fence shape. The other photo shows the Climbing Wattle around a cabbage field to protect it from animals (mostly the neighbor's pig). The Climbing Wattle takes longer to establish than the other species, but it is also drought tolerant and the only one of the four species that has thorns. The thorns make it more effective fencing.

Variations of living fences exist for all four of these species. For example, bamboo can be added as trellising to any of them. Barbed wire can also be used to make more effective fencing, but with an added cost. The spacing between trees can also vary depending on farmer needs. Additional rows can also be planted side by side, making thicker fences that can serve as fodder banks for cattle or biomass production. Evidence from Anlong Thmey shows that three of the species (*Leucaena leucocephala*, *Moringa oleifera*, and *Acacia penata*) can be used for human consumption and can be sold in the local markets, providing additional income and household nutrition.



Photos by Dave Ader

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Disclaimer

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