

Firewood Plantation as an Alternative Source of Energy in the Philippines

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ABSTRACT : The increasing price of liquefied petroleum gas (LPG) has forced many households to shift to firewood/charcoal in the Philippines, causing tremendous pressure on the dwindling forest. This transition is more obvious in the rural area where firewood price is almost half of that in the cities. Both problems on big demand for firewood and the pressure on our forest can be partly solved by going into firewood plantation. After all, the country has vast track of idle lands, both private and government lands, waiting to be developed. What the government can do are: a) aggressive promotion of firewood plantation, b) simplify further the old technology on establishing firewood plantation to encourage more farmers, c) improve charcoal processing and d) promote the use of efficient stoves. This write up discusses the need for firewood plantation, areas available for planting, where to plant in farms, what species to plant in a particular soil type/location for optimum growth, planting methods, harvesting, marketing, and the side lights on the ecological benefits derived from plantation aside from wood.

Keywords : Firewood, Charcoal, Firewood plantation

INTRODUCTION

Firewood and charcoal are the main source of energy for cooking in the Philippines, specially in the rural areas. But lately, even middle income families have started to use firewood/charcoal due to the increasing price of liquefied petroleum gas (LPG) which have gone up to P600/tank (11 kg) from P450.00. Many of restaurants have also shifted to firewood/charcoal for significant savings. A family of five, consuming a tank of LPG a month is saving from P300 - 400 a month using charcoal at P120-150/sack. The savings of families in the rural area where price of firewood is half of that in the cities is much bigger than urban families. Moreover, LPG price is also higher in the rural areas due to transport cost from the distributor, a double whammy for townfolk to use firewood

With many households using firewood and charcoal

due to the progressively increasing price of LPG, demand for charcoal will correspondingly increase, resulting to tremendous pressure on the natural forest and plantations. Both problems on big demand for firewood/charcoal and the pressure on our forest can be partly solved by going into firewood plantation. After all, the country has vast track of idle lands, both private and government, waiting to be developed. What is needed is to simplify further the old technology on establishing firewood plantation and a big push by concerned agencies, LGUs, NGOs.

This write up discusses the need for firewood plantation, areas available for planting, where to plant in your farm, what species to plant in a particular soil type/location for optimum growth, planting methods, harvesting, marketing, and the side lights on the other benefits derived from plantation aside from wood.

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RESULTS AND DISCUSSION

Areas available for firewood farm

Farmers interested in planting firewood species can do it in timberland and in private lands. Under timberlands, Local Government Units, farmer associations or individual were issued the following tenurial instruments to legalize occupation/development of timberlands: Certificate of Stewardship Contract (CSC) under the Integrated Social Forestry (ISF) Program; Community Based Forestry Management Agreement (CBFMA); Co-Management Agreement -with LGU as partner; Military Reservations - in some provinces are big areas of Military Reservation that could be converted to firewood farm by administration or through lease to the community as in Panay; and Abandoned Pasture Lease.

In private lands, owners has the following options: Landowners as developers; tenants planting firewood species in stead of corn; Tree Farm Leasehold (TFL) - landowners without capital and time to manage tree farm can lease the land to developers (individual or group) on agreed sharing arrangement.

Where to plant

After identifying the area for firewood plantation, wherein accessibility is the primary consideration, you have another options; where to establish the plantation to optimized production (Yao, 1993): along boundaries - in case your land is already allocated to different land use, farm boundaries could be devoted to firewood trees. Added bonus for boundary planting is that it clearly and permanently marked your property. But before planting it is only proper to inform your adjacent owners to avoid conflict, later, on overshadowing. Better yet to encourage your neighbor to also plant trees along boundaries; along gullies - these are areas not often cultivated due to steeper slope and can not be plowed. Generally, you find some naturally growing trees in most gullies so you just applied Assisted

Natural Regeneration (ANR) and do some enhancement planting of preferred species; under coconut plantation - old and widely space coconut plantation can be interplanted with firewood trees; along roadside - idle lands along roads are the most ideal for firewood trees; along beaches - coastal areas have a 20 m buffer zone which you can plant beach species for firewood; and backyards - depending on the size of your homelot and existing land use, your backyard is a good site for firewood trees.

What to plant

After knowing where to plant, the next question to ask is what species to plant for optimum growth. This really depends on the location, soil type, existing land use in the area, personal preference for multipurpose trees. Below are some of the criteria in selecting the species to plant: Fast growing species - for immediate economic returns, say 3-4 years of waiting for the harvest; Nitrogen Fixing Trees - like *Acacia auriculiformis*, kakauate (*Gliricidia sepium* [Jacq] Walp), and giant ipil-ipil (*Leucaena leucocephala* Lamk), could thrive well even in degraded soil because of the root associated bacteria are capable of fixing nitrogen in the air and absorbed by the roots; Acid/Drought tolerant - to be able to survive in highly acidic soil and extended summer; High calorific value - generally wood with high heating value are slow growing but there are some fast growing trees like kakauati and giant ipil-ipil with high calorific; High coppicing power - this is to ensure the species could withstand repeated harvesting without replanting; Can be directly seeded and establish by cutting - for easy adoption. The idea is to simplify tree planting like that of corn technology - dig and sow; Local preference - some farmers may have their own choice of species for a particular reason and familiarity, especially for multipurpose trees that will address their domestic needs like: wildfood, fiber, forage for their livestock, etc.

Simplified planting techniques

Plantation establishment for firewood is an old technology but have not been popular due to its low value then. But this time firewood has gain new importance due to the increasing price of LPG. What is emphasized here is direct seeding and the use of cuttings, especially for kakauati. Site-Species Matching - different trees have different site preference. In rocky soil/degraded areas, the *Acacias* (*A. auriculiformis*, *A. mangium*, *A. crassicarpa*), kakauati, kamachile (*Pithecellobium dulce*) have are known to thrive well. On the other hand, in waterlogged areas, bangkal (*Nuclea orientalis*), lanipau (*Terminalia copelandii*), are doing well. While, bogo), banalo (*Thespesia populnea*, bitaog, agoho (*Casuarina equisetifolia* L.), and *A. crassicarpa* dominates along beaches. Although technologies of some species are not yet popular, they can always be tried.

Harvesting

Unlike timber production which takes 10-20 years to harvest, firewood has only 3-4 years cutting cycle. Harvesting may be done by: Strips/blocks - strip or block harvesting, either alternate or progressive, depending on the purpose. If you want increase the growth of the remaining trees, every other strip is done. For convenience, block harvesting is preferred. Clear cutting - is usually done if the price is high; selective cutting - cutting the bigger trees to enhance the growth of the smaller ones. Fuelwood production using giant ipil-ipil can generate P36,868 per hectare of net present income or 1.75 gain for every peso investment (Arciaga, 1999).

Marketing

Marketing is one of the biggest problems in tree farming as the price is controlled by the buyers. Farmers Can sell the firewood lot as: firewood, as charcoal, or by stumpage/woodlot, depending on the highest perceived

value: Firewood - if the site is close to the road and price is high; Charcoal - if site is a bit further from the road that selling firewood would entail high cost in transport; and by woodlots if the farmers have no time for harvesting and marketing.

Other Benefits from Firewood Farm

Aside from the guaranteed firewood/charcoal after 3-4 years from firewood farms, landowners will also benefits other goods and services that the trees/forest provides, such as: Food, fodder, fiber and other non-timber forest products from firewood farms to meet some of their needs. This is the objective of the Tree Domestication Program of the International Center for Research in Agroforestry (ICRAF), now the World Center for Agroforestry - the aggressive cultivation of indigenous species to meet the non-timber forest product needs of the small farmers; Improve soil nutrients - trees acts like a nutrient pumps, with its root systems absorbing nutrients from below but returns the same elements to the soil through its litterfall. Leaves of some species that decomposes faster than the rest (akling parang, kakauati, ipil-ipil) are effective soil ameliorant, especially if the trees are planted along contours; check soil erosion - forest cover is not a guarantee against soil erosion. If the trees are close together and the grounds are bare due to absence of vegetation under the canopy, the accumulated rain drops on the leaves causes heavy impact on the soil surface, especially from big leaves species like teak *Tectona grandis* and *Ficus callosa*, that eventually causes soil erosion. So firewood farm should encourage undergrowth; prevent flashfloods - the combining effect of the canopy, forest litter, root systems and undergrowth retards runoff and enhances infiltration to prevent flashflood; improves local climate - the cooling effect of foliage due to release oxygen and shades lowers temperature in the locality with forest cover; carbon sink - this is latest known function of the forest with global effect (Paula et al., 2006); serves as windbreak - in windy areas, the forest could serves as

windbreak to protect agricultural crops

Recommendation

- Aggressive promotion of firewood farming by DENR, LGU. NGO - like any tree planting programs. firewood farming badly needs the aggressive support of the government and the private sectors through effective IEC, including showcasing in strategic sites
- Relax policy on harvesting and transport - some tree farmers are complaining of red tapes on harvesting.
- Improve technology on charcoal processing - charcoal processing is very tedious and low efficiency. Agency

concern should study on how to improve the efficiency of charcoal making

- Tax incentives and Marketing assistance

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