Step 4
For 12-year old clumps check that after removing unwanted poles there should be 16 poles left, four each of the 1-year old poles, 3-year old poles, 5-year old poles and four 4-year old poles. The 4-year old poles should be ready to be cut at the appropriate month of harvesting.

Step 5
After cleaning and clearing each clump cover the base of the clumps with the leaf litter to protect the new shoots that may emerge and to serve as mulch and source of organic matter for the plant.

Step 6
Every year new shoots emerge from the clump. Four vigorous shoots should be marked and left to grow as poles. It is safest to mark those to be left at the start of the shoot season to assure that there is enough culms to grow. All other shoots that emerge after identifying those to grow as poles will be harvested for food.

Step 7
Maintain the clumps regularly. Cut the thickets and branchlets at the base of the clumps. Leave thickets and branchlets above two meters from the base to hold the clump during strong winds and prevent the poles from falling or lodging. Irrigate the clumps whenever possible to improve shoot production.

Step 8
Harvest matured poles (4 years old) at the right time. The best time to harvest is when the starch content of poles is very low. In the Philippines just after the rainy season and early summertime is best to harvest.

Cut the poles just above the second or third node from the base whichever is convenient during harvesting.

Step 9
Harvested poles and stumps/roots should be brought immediately to processing centers for proper drying and preservation treatments.

Pole and Shoot Production
The computation for pole yield is fairly straight forward and simple using the results of the MMSU-PCARRD-AICAR Project. Given a one hectare bamboo plantation spaced at 7m x 7m, or 204 clumps per hectare, the potential harvest using the 4-4-4-4 technique will be 4 poles per clump or a total potential harvest of 816 poles per hectare per year.

For shoot production the average Productivity Index for Bambusa blumeana is 0.49. This means that each pole present in the clump can potentially produce 0.49 shoot every year. For the 4-4-4-4 technique, the 1, 2, and 3-year old poles growing every year the potential number of shoots is 6. If 4 shoots will be marked and allowed to grow for the next harvest of poles 2 will be left for shoot production. For a hectare there will be the potential of 416 production of shoots.

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Production of Quality Bamboo Poles and Shoots

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INTRODUCTION

Bamboo is a plant known for its many uses. It has become the best substitute for wood in the furniture, handicraft, and construction industries, not withstanding other benefits as a source of food, biofuel, and for environmental protection. In the Philippines natural bamboo stands are luxuriantly growing along farm boundaries, roadsides, riverbanks, backyards, and hilly areas. There are about 65 known species of bamboo found in the country but the most commercially exploited species is Bambusa blumeana Shultes locally known as Kawayan or Kawayan-likin.

Bambusa blumeana is native to the Philippines (from Luzon to Mindanao), and has a leafy branchlet with an enlarged top portion bent with thorns. The base of the clump is densely set with seemingly impervious spiny branchlet and branchlets. The spiny branches hold the plant firmly during strong winds preventing the poles from lodging. The culms is almost solid at the base and thick-walled to the middle portion and can reach a diameter of 15 cm. The internodes range from 5 cm at the base to about 35 cm at the middle and top portions of the pole. A robust pole can reach 20 m in length. Young shoots are edible. As a grass it regenerates faster than wood, has a very short growth cycle, and can be harvested four years after planting.

Propagation is practically easy and inexpensive. The plant can be propagated by one-node or two-node cuttings. The propagules from culm or branch cuttings can be grown in plastic bags under ordinary nursery conditions for six months before transplanting in the field. Bamboo or Kawayan can be profitably grown anywhere in the Philippines on practically all types of soil with virtually little care and effort. Planting potted propagules should be carefully transported to planting site during the onset of the rainy season to assure high survival. The plants can be set in the field at a distance of 7m x 7m with a total of 204 plants per hectare. Initially each plant can be applied with 300 g complete fertilizer during the first year of the plantation.

Large areas of bamboo plantations have to be established to supply the increasing demand for poles. The most ideal sources of raw materials for the various uses are commercial bamboo plantations but there is not enough to supply the demand of various industries. The most logical source at the moment are the natural stands of Bambusa blumeana which are found all over the provinces of Region 1 and other areas in the Philippines. The natural stands are ready source of materials if given proper management. They require only a short time and less investment than newly planted plantation before returning profits. Considering these conditions and requirement this module provide some pointers and guide on the rehabilitation, maintenance, rejuvenation, and harvesting techniques to ensure sustainable production of quality poles and shoots in otherwise unmanaged plantations and natural stands.

Key Words and Illustrations

Shoot- the ascending axis commonly known as the young growing culm that emerges from the underground rhizome. It is usually identified with a mother plant or pole that supports it during the growth stage.

Clump- composed of many culms or group of poles growing together distinct from other groups.

Culm- a segmented aerial axis that emerges from the rhizome; the main stem of bamboo plant is commonly called pole.

Stump or butt- the lower portion of the pole cut 2-3 meters from the base.

Steps in Rehabilitating and Managing Unmanaged Bamboo Plantation and Natural Stands

In an unmanaged 12-year old clump there are approximately 20-30 poles present. In older clumps the number can reach up to 75 poles per clump.

Step 1
Start cleaning along the periphery of the clump. Cut and remove the branches, branchlets, and thickets to have a clear view of the poles at the inner part of the clump.

Step 2
Count the number of poles present in each clump. Identify and mark 4 each of the poles as below 1, 1, 2, and 3-year old poles. Young poles are easily distinguished with the presence of leaf-sheath still intact in the nodes of the pole. The outer culm of older poles are shiny and smooth.

Step 3
Remove all dead poles, broken, defective, and all poles older than 4 years old to homogenize the age and sizes of poles. Use small power chain saw to be able to penetrate to the middle portion of the clump.