Factsheet

Kanoppi Phase 2

Species trial for timber production on community forest dryland in Gunungkidul District, Special Region of Yogyakarta

1. Why did we do this research?

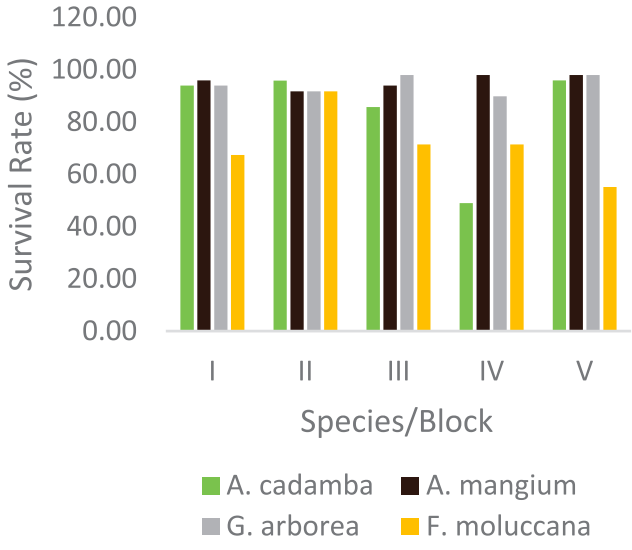
Suitable timber species are not only reflected in their growth, economic value and adaptation capability but also in their ability to form an ideal growth structure. In selecting the best timber species to be grown in a certain area, observation of growth of timber species in similar areas and periods is required to find alternative tree types that can grow better. This information can be used as the basic consideration in determining timber species for community forestry.

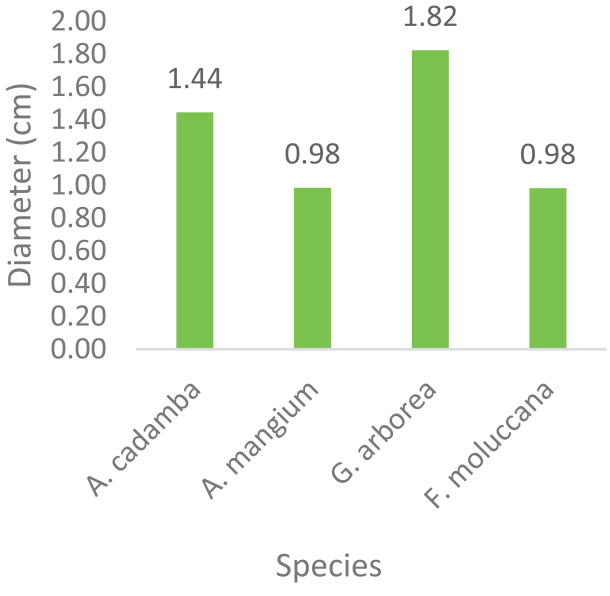
The objective of the research was to find the growth variations of community forest timber species to provide to farmers developing community forestry.

2. How did we do the research?

The research was conducted on community forestland in Semin Village, Semin Subdistrict, Gunung Kidul District of the Province of the Special Region of Yogyakarta. The species were *Acacia mangium, Anthocephalus cadamba, Gmelina arborea* and *Falcataria moluccana*. The planting activity was implemented in the wet season of 2018. The treatments were compost and NPK, herbicide and pesticide. Land preparation for the timber research plots began with making planting holes at spacing of 2 x 3 m. The study was preceded by planting four timber species on community forestland based on the research method (four species) according to the experiment design. Measuring was carried out on tree height and diameter every six months. The tree height was measured from the soil surface to the top part of the tree by using fierce measurement. Tree diameter was measured using a caliper.

The experiment design followed randomized complete block design. The species treated were 1) monoculture *Falcataria mollucana* (Fm); 2) monoculture *Anthochepalus cadamba*; 3) monoculture *Gmelina Arborea*; and 4) monoculture *Acacia Mangium.* Each treatment was applied in five blocks as the smallest homogenity unit. The experiment unit consisted of 7 x 7 plants = 49 plants. Four treatments x 49 plants x 5 blocks = 980 plants (245 plants of each species).





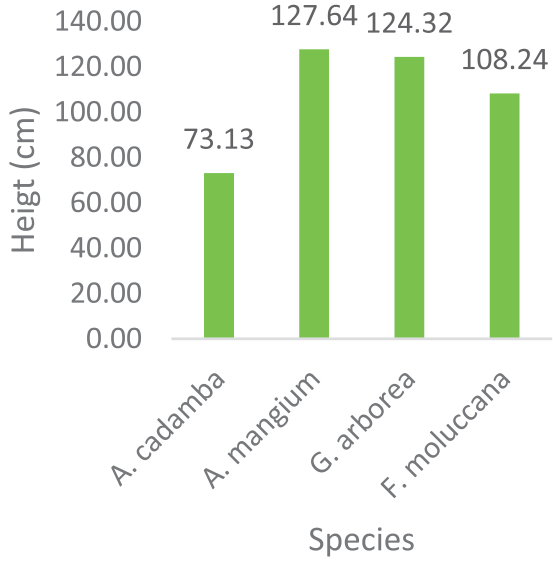


Figure 1. Survival rate, height and diameter growth of four species at 7 months-old

3. What are the findings?

The trial was established in December 2018. Evaluation of growth and survival percentage was carried out at 7 months-old. There were some results of other species' trials elsewhere as potential comparators and discussion material related to this research. The survival, height and diameter growth of the species in the trial at 7 months-old are presented in Figure 1.

A. mangium is an exotic species proven to be able to grow well in various conditions of plantation forests in Indonesia. Even the spread of seeds carried by the wind can produce natural regeneration that grows well on marginal land. *A. mangium* as a pioneer plant had a relatively better survival rate than *F. moluccana* and *G. arborea* in Ciamis, West Java (Dendang and Sudomo 2019). Ciamis results showed that after 18 months, growth of *F. moluccana* was faster than *A. mangium* whereas diameter growth was the opposite (Benyamin and Sudomo 2019). Research in Sumbawa found after 21 months' growth height and diameter of monoculture *F. moluccana* (489 cm/6 cm) and monoculture *G. arborea* (425 cm/8.5 cm). Further, other research found height and diameter growth of 2 year-old *A. mangium* monocultures in Hawaii (6.8 m/6 cm) and Costa Rica (8 m/9 cm) (Schonau and Coetzee 1989). These results show that in habitats suitable for growth, *A mangium* can

Figure 2. Appearance of the four species in the plot: 1) *G. Arborea*; 2) *A. Mangium*; 3) *F. Moluccana*; and 4) *A. Cadamba*

reach almost two times more than the results from Ciamis, West Java. In mixed cropping patterns, *A. mangium* had the best survival rate but a growth rate lower than *F. moluccana*, which causes the growth of *A. mangium* to be inhibited owing to obstructed canopy (Dendang and Sudomo 2019). Widiyanto et al (2013) found that the widest spacing (2 x 4m) in a monoculture pattern produced higher growth than closer spacing. Growth in eucalyptus is higher at wide spacing and *Eucalyptus grandis* experienced decreased height with reduced spacing (Adlard 1992, Schonau and Coetzee 1989).The appearance of each plant at the trial location is shown in Figure 2.

4. How can the findings benefit farmers' livelihoods and the environment?

Faster timber harvesting will encourage farmers in the timber sector. Agricultural crops can be planted beneath the canopy. And more diverse income will cause farmers to cultivate land more intensively.

The use of manure for fertilizing trees is better for the environment. Homegardens and livestock pens can be cleared of animal waste. The use of organic fertilizer improves soil fertility of forestland. Sloping land can be protected from erosion. Trees reduce surface erosion. Smallholders use intercropping as

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one of the techniques to keep soil in good condition. Ecologically, trees reduce erosion risk owing to their extensive and strong root networks. In addition, leaves also function as inhibitors of direct rainfall to the soil surface.

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Aris Sudomo | Balai Penelitian Agroforestry (BPTA) Ciamis
arisbpkc@yahoo.com