

IMPROVED TECHNIQUE OF TEAK PLANTING

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Introduction

India's population has crossed 844 million by 1991. On one hand population is increasing at high rate, on the other hand deforestation is faster (1.3 million ha, NRSA Data 1984). Whatever may be the human population growth rate and forest growth rate is just comparable in opposite direction, the former increases and later decreases. Forests in India are under unbearable biotic pressure. Out of 75 million ha of recorded forest area in the country nearly 37 million ha or 49% are degraded with less than 40% crown cover density. The growing stock at 65 m³/ha is very low compared to the world average of 110 m³/ha. Mean annual increment is low at 0.5 m³/ha/yr against the world average of 2.1 m³/ha/yr. The impacts of loss and degradation of forest are in the form of soil erosion, degradation of watershed area, loss of biological diversity, climatic changes and reduction in economic contribution of forests to human needs.

Urgent steps are required for restoring the green cover of area, improving land productivity and production of firewood, timber and other forest products.

The important measures in this regard are :

(a) Improving growing stock of the national forests to optimum level for achieving maximum productivity potential on sustainable basis.

(b) Restoration of degraded forests to productivity through replanting of sustainable species keeping in view the climatic condition and site characteristics.

(c) Breaking the negative patterns leading to continuous degradation by technological factors that limit the yields. Here we can think of technological changes now.

The projected requirements for 2010 A.D. are nearly thirteen times the maximum annual sustainable cut of 32 million m³ based on current growing stock.

In order to match the demand, productivity of areas has to be enhanced by intensive plantations. This is the time when we have to go in for pragmatic productivity forestry.

Intensive Planting Method

Apart from genetic quality of the planting stock and inherent site quality, improved package of practices, adequate inputs and effective protection of plantations

are important in determining productivity of plantations on different sites.

Here we are going to discuss the traditional teak planting technique vis-a-vis the improved technique. The traditional method consists of :

- (a) Clearfelling the area.
- (b) Burning and reburning of debris and brushwood.
- (c) Alignment and staking of area with bamboo or small wood.
- (d) Stumping in crow bar holes.

In this technique a huge biomass used to be burnt along with the humus of the soil. This burnt pulverised mass on slopy areas used to be washed off in high rainfall areas. Since Govt. of India has banned clearfelling, the brushwood is not available for burning as well. Procurement of staking material also means disturbing the bamboo growth in some other area and using the same for the purpose for which some alternatives can be thought of.

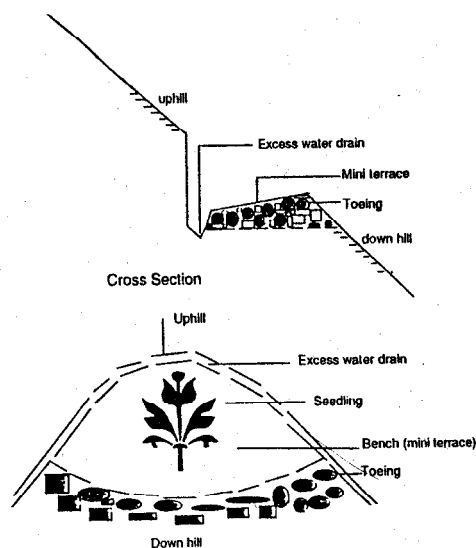
Under various plantation schemes, Teak is also being planted in degraded areas where humus is poor or wanting in soil. The idea of digging pits, refilling and stumping is fast picking up for teak plantation models which is a very costly technology. With this in background, we have tried and developed successfully an improved method of teak planting which is cost effective.

Technique discussed

On the slopy areas of Western Ghats we have planted teak on Bench (Mini) terraces wherein the hill side is dug up at predetermined aligned spot and excavated soil is taken and deposited on the down hill

side forming a bench like space. This bench is known as terrace and upper flat portion is called as step. Usually step of a terrace slopes down slightly into the hill. Width of a step varies with the degree of slope and texture of soil. Steeper the slope, the narrower the terrace is made. The soil collected in each step is supported with stones and available boulders so that it remains intact and soil is not eroded. Also we prepared excess rain water drain along up-hill side of semi-circular shape. The idea is to check the flow of water, fix the site of stumping and to retain soil moisture for a longer duration. The soil collected in the operation is broken, collected and neatly spread giving an inward slope. The toed soil forms a firm platform for teak planting. All care has been taken to drain out excess water. Stumping is carried out by crow bar technique on these mini-terraces. The

Fig. 1



Plan of mini-terrace



Area before treatment



Mini-terrace Front View

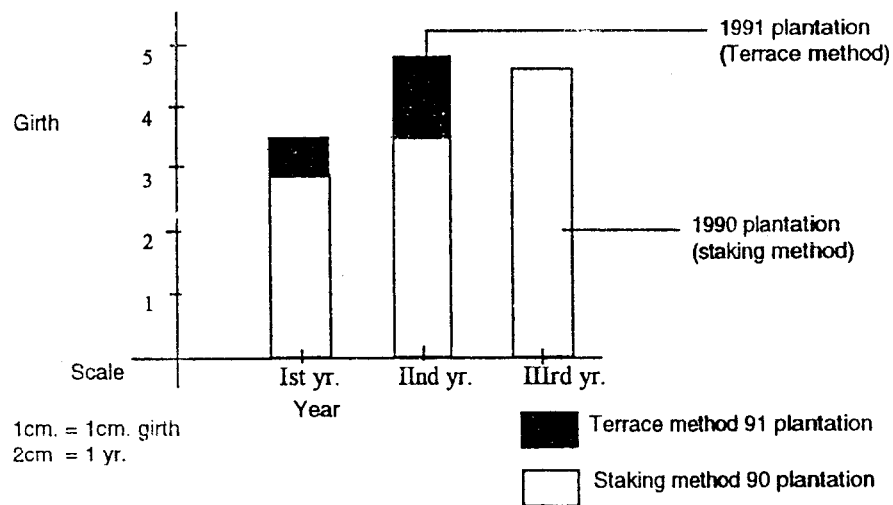


Teak on Mini-terrace Ist year



First year plantation an overview

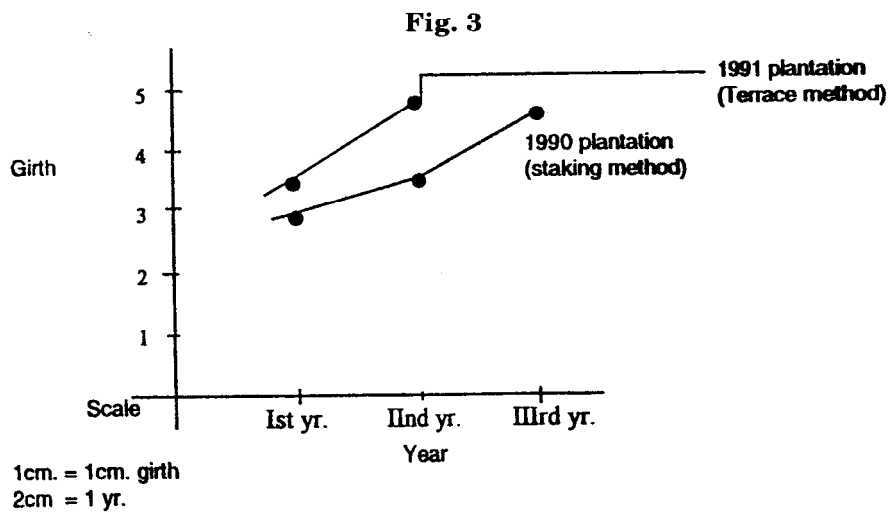
Fig. 2



Histogram showing increment of girth



Teak on Mini-terrace 2nd year

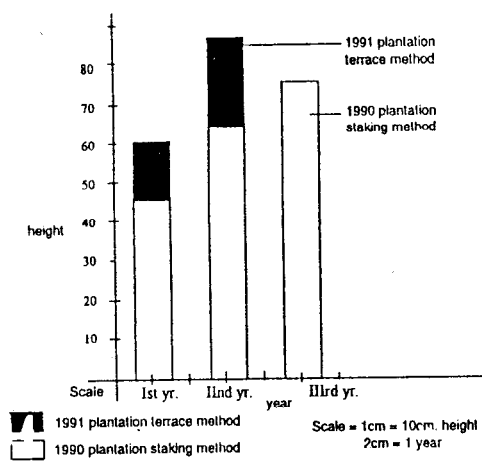
Second Year plantation
(Mini-terrace method)

Graph showing increment of girth



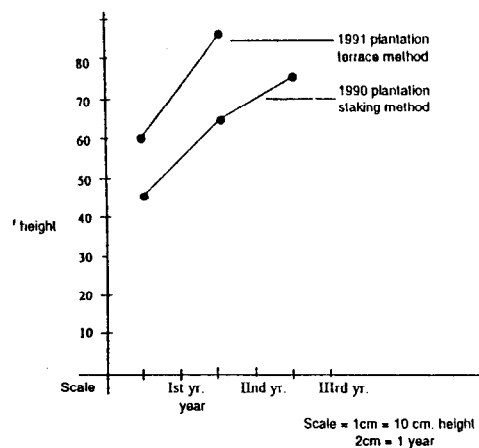
Teak on Mini-terrace 3rd year

Fig. 4



Histogram showing comparison of height increment

Fig. 5



Graph showing comparison of height increment



(Third Year Plantation (Mini-terrace method))

alignment of these small terraces would be as per the requirement of the scheme i.e. 2 m x 2 m or 3 m x 3 m (as the case may be). The work of preparation of mini-terraces are carried out as part of premonsoon operation.

Advantages of mini-terraces technique

(1) Site becomes ready for stumping well in advance. As soon as monsoon sets in, stumping can be carried out in the shortest possible time. The heat of soil also helps in sprouting of stumps. In the traditional system, the staking work usually starts with first showers because only then this operation becomes easier to carry out. Without alignment and staking, stumping cannot be carried out. All these operations consume lot of time which otherwise would have been utilised for growth by the seedling.

(2) Advance planning of entire planting works, labour procurement etc. can be effectively made.

(3) In this method there is no need to carry out staking in alignment. Mini-terraces remain prominent and intact. Thus the stake material is also saved to be cut from any other forest area permitting it to grow for the society.

(4) It has been observed that stumps experience stress period between two showers if interval of rainfall is more. However, in the new method it has been observed that due to moisture retention in the bench, the sprouting is quick and it does not experience the initial shock of rain stress. Therefore the growth of seedling is continuous throughout the rainy season and even thereafter.

(5) In slopy areas soil erosion is totally checked and thus root system is never exposed to sun. It has been observed that in traditional method especially in high rainfall area, stumps get exposed because of which root system does not develop timely.

(6) Run-off is checked. Excess water is

drained out for individual seedlings. Question of water-logging would not arise if inward slope to the bench has been given.

(7) On the bench, since the soil is worked extensively, weed growth around seedlings is minimised effectively and thus there is no chance of weeds overtopping the seedling. Time of weeding operations generally coincide with agricultural works due to which, operations get delayed for want of labourers. The above method takes care of this.

(8) Survival and growth (height and collar diameter) are better vis-a-vis the traditional method. It has been discussed in our result para substantiated by growth charts and graphs.

Cost discussed : We have carried out the work study for preparing mini-terraces. One labourer can prepare nearly 108 terraces in 8 hrs i.e. 9.2 mandays are required for 1000 mini-terraces. With the prevailing daily wage rate i.e. Rs. 29.10, the preparation cost for one mini-terrace would be Rs. 0.27. The provision of rate structure for transport and staking is 0.35 mandays/100 seedlings and also the stake cost of Rs 0.16 stake. Thus the provision exists for Rs. 0.23/plant. Rest of the requirement out of same rate structure can be met in contingency amount.

If we compare cost effectiveness of mini-terrace system with pit method, we find the latter almost costing four times more than the former (Ref. Ghanekar Committee Rate structure). Therefore, we have come to a conclusion that mini-terrace system is cost effective with better results.

Results

In West Nasik Project Division of Forest

Development Corporation of Maharashtra, we have tried the mini-terrace system since 1991 in some compartments of plantations. The growth pattern is as given in Tables 1 and 2.

Table 1

Data of average height and girth
(This data is based on 10% sampling)

When recorded	Height (cm)	Girth (cm)
<i>1991 Plantation (Terrace method)</i>		
F.S. Kawnai Comptt. No. 361		
Oct. 92	61	3.5
Oct. 93	87	4.8
<i>1992 Plantation</i>		
F.S. Kawnai Comptt. No. 341		
Oct. 92	30	2.10
Oct. 93	62.78	4.75
<i>1993 Plantation</i>		
F.S. Kawnai Comptt. No. 361		
Oct. 93	27	1.5

Table 2

Data of average height and girth
(Based on 10% sampling)

When recorded	Height (cm)	Girth (cm)
<i>1990 plantation (Staking method)</i>		
F.S. Kawnai Comptt. No. 360		
Oct. 91	46	2.90
Oct. 92	65	3.50
Oct. 93	76	4.60
<i>1990 plantation (Staking method)</i>		
F.S. Kawnai Comptt. No. 341		
Oct. 91	50	3.60
Oct. 92	68	3.95
Oct. 93	80	4.75

If we compare the data of Tables 1 and 2, we find that growth pattern is in favour

of terrace method where height increment is 30.81% more than traditional system. Similarly girth increment is 29.92% more than traditional system.

Table 3

*Increment percentage of terrace system
over traditional method*

(a) Comptt. 361	Height	Girth
32.60%	Ist yr.	20.68%
33.84%	IInd yr.	37.14%

contd...

(b) Comptt. 341	
26%	31.94%
Average	
30.81%	29.92%

Therefore we are of the opinion that only this system should be adopted for planting teak.

SUMMARY

In this paper an improved method of teak planting which is cost effective, has been described in detail.

सागौन रोपण की परिष्कृत विधि

अनिल मोहन व पी० के० कुलकर्णी

सारांश

इस अभिपत्र में सागौन रोपण की परिष्कृत विधि विस्तार से बताई गयी है जो लागत की दृष्टि से भी प्रभावकारी

Snippets

BIGGEST TEAK TREE

Biggest Teak (*Tectona grandis*) tree of India. Age about 600 years, height 45 m, girth 637 cm (B.H.) and seed still viable (81% germination). Sangam Range, Parambikulam Wild Life Sanctuary, Kerala.