

MANGROVE PLANTATION AT THE RITUCHAKRA BY HOPE

Amol Patwardhan and Madhuri Pejaver
Members of HOPE (Here On Project Environment)
Sahayog Mandir, Ghantali Path,
Thane(w)

ABSTRACT : HOPE is a NGO actively working in the field of environment with the objectives of nature awareness, nature education and nature conservation. HOPE has undertaken a program of mangrove plantation near the nature park Rituchakra from the year 2000. With the help of HOPE volunteers, successful plantation of different varieties of mangroves is done, in which some new varieties of mangroves, which were not present in this area, like *Rhizophora mucronata*, *Agiceras corniculatum* and *Bruguiera cylindrica* are introduced in this area of which only *Rhizophora* is successful.

Key words: Mangroves, plantation, NGO

INTRODUCTION:

Mangrove is a group of typical tropical and specialized trees growing on the saline and brackish water system. They show unique biological phenomenon because they survive water logging, poor soil aeration, salinity, high humidity, which are combinations of the conditions not tolerated by other plants. Mangrove swamps are most suitable as feeding, breeding and nursing grounds for many marine organisms. They act as important link in an estuarine food chain, provide protection against storm damage, act as soil binders and prevent erosion of soil. (Patil, 1988; Ranade, 1988).

Mangroves are seen growing luxuriantly along estuaries, back water islands and in protected areas. Thane city is one through which runs Thane creek and on the banks of it are seen the mangroves from Vikhroli till Vasai, of which some have very good growth with height of about 40'-50'.

PRESENT STATUS:

At present many of these mangroves, particularly in the vicinity of the habitations have been over exploited, neglected, destroyed and degraded for different reasons. Encroachments, urbanization, industrialization have caused serious setback to mangroves habitats. Polluted waters and human interference is causing serious damage to mangroves all over and the picture is no different near Thane city.

We, the members of HOPE, felt that if we take up artificial regeneration of suitable mangrove species best suited locally along with the protection and preservation of existing mangroves, it would be possible to grow the thicket of mangroves which at least partially may regenerate the previous habitat, which is in agreement with Sawant (1994), Untawale (1994) who

also suggested the silvicultural practices will help in restocking the degraded mangroves.

Similar suggestion was made by Andrade *et al.* (2000) for mangroves of Chendiya creek. Keeping this in mind mangrove plantation was initiated by the NGO-HOPE in the in year 2000 as a pilot program which is discussed in the present paper.

AREA OF PLANTATION:

In Thane city near Kalwa bridge the area near a bank of Thane creek was used as a garbage dumping ground. HOPE has taken the initiative and is successful in stopping this garbage dumping. Now with the help of TMC (Thane Municipal Corporation) a nature park, named as Rituchakra, is being created in this area. The area is approximately 1.5 km long, 80m wide and about 17 acres. It is divided in 6 zones according to different seasons or Ritus. The area is protected by a fence wall. The plantation activity in Rituchakra is taken up by Thane Municipal Corporation (TMC).

In this area towards the waterside the mangroves were damaged and hence HOPE volunteers selected this area for plantation of the mangroves.

METHODS:

Nursery techniques: Different nursery techniques as suggested by Untawale (1986) were used for growing saplings.

- Polythene milk bags were filled by the soil mixed with the bio-fertiliser. Deshmukh (1994) has used farm yard manure.
- The mixture of soil and bio-fertiliser was added in the pots or drums in which many seeds could be planted at a time.

- Nursery beds were prepared in the plantation sites where seeds were sown.
- Some HOPE members grow the saplings at home in the small pots or containers.
- Full-grown mangrove seeds of different varieties were collected from the site, from existing mangroves or from near by areas and were sown in the bags, pots or the nursery beds.
- The collection of propagules or seeds was done mainly from June to September as that is the season for most of the mangroves. (Untawale,1986; Kathiresan,1994)
- The saplings were given fresh water till they grew to size of 25-30cm, were ready for plantation.
- The germination of the seeds started within about 7 to 8 days. About 70-80% seeds of *Avicennia* spp. while only 50% seeds of *Salvadora persica* germinated and the saplings grew to the height of 25-30cm (*Avicennia* spp.) and 12-13cm (*Salvadora persica*) by the end of the rainy season and were ready for plantation.
- 3 to 4 months old naturally grown saplings under the mother plants of different varieties were also collected and planted. This also suggested by Raddy (1987,1994)
- Only healthy, mature, naturally fallen *Rhizophora* propagules found under the mother trees were preferred as suggested by Raddy (1987,1994). While the matured, healthy seeds of *Avicennia* were collected either from plant directly or from the one fallen below the mother plant.

PLANTATION METHODS:

The saplings were planted in mud flats near the creek edge of Rutuchakra. The plastic bags was torn at the base and immersed fully in the mud. The saplings from pots and drums were separated out without hurting the roots and then planted by digging out the mud a little. At certain places the mud was too soft and unreachable, there the saplings were dropped from the height which could easily sink in the mud and remain straight. Whenever possible, care was taken that newly planted saplings would not be directly exposed to force of the tidal waves. However in totally barren patches, this was not possible.

SPECIES OF THE MANGROVES PLANTED:

The efforts were to conserve the original species and also to introduce new species.

Avicennia marina forms the dominant genera of the mangroves in this area, along with few plants of *Sonneratia apetala*. *Salvadora* spp. the mangrove

associate is also seen common in this area. But along with this the new species like *Rhizophora mucronata*, *Agiceras corniculatum* and *Bruguiera cylindrica* were also planted in this area. Most of these species are also suggested by Untawale(1986,1994), Raddy (1987,1994) as they are available easily and their propagules or seeds also are available in considerable numbers in mangrove forest.

The mangrove plantation program was as follows:

Mangrove species	Year		
	2000*	2001*	2002*
<i>Avicennia marina marina</i>	606	950	—
<i>Avicennia marina officinalis</i>	214	772	48
<i>Salvadora persica</i>	2200	100	—
<i>Rhizophora mucronata</i>	07	86	48
<i>Agiceras corniculatum</i>	70	50	—
<i>Bruguiera cylindrica</i>	59	—	—
<i>Sonneratia apetala</i>	—	35 fruits	—
<i>Ceriops tagal</i>	—	50	—
<i>Excoecaria agallocha</i>	—	15	—

* Figures in column indicate number of seeds, saplings or propagules planted

RESULTS AND DISCUSSIONS:

Each species among the various species planted gave different results.

- *Agiceras corniculatum* and *Bruguiera cylindrica* propagules which were planted in 1st year, were very small. These propagules were planted in polythene bags and then directly in the mud in zone 1. in this zone tidal action is more, water mass is also more and hence all the propagules were either buried in the silt or washed off. Only one propagule of *Agiceras corniculatum* were survived.

Second year *Agiceras corniculatum* saplings which were one year old, were planted in zone 3. But this zone seems to be more polluted as these saplings did not survive. According to Untawale(1986) sewage pollution or low level non toxic pollutants may not have harmful effects on the mangrove plants but toxic substances increase mortality.

- *Sonneratia apetala*, 35 fruits were sown but not a single germinated.
- *Salvadora persica* seeds were sown in polythene bags, in the nursery beds and also in pots but germination rate is hardly 40% while survival rate is 10%.

- *Ceriops tagui* and *Excoecaria agallocha* saplings were planted in zone 3, where again the survival rate is 0%.
- *Rhizophora mucronata* was also a new species introduced and it showed good survival rate. *Rhizophora* saplings were 1 year old when planted and showed 50% survival.
- Both the species of *Avicennia* showed good survival rate – about 60-70%. This might be the reason for the dominance of these species in locality. Similar observations were reported by Patil (1988) or it can be preference of soil as *Rhizophora* spp prefer muddy soil while other species like *Ceriops* and *Bruguiera* prefer more drier soil (Aksornkoae, 1985)
- While according to Jagtap (1988) paleo botanical evidences suggest that *Avicennia*, *Sonneratia* and *Rhizophora* were the first mangrove species to appear, which might be the reason for wide spread dominance.
- Growth rate of the saplings planted in zone 4 and 5 was good and saplings almost doubled in height in one year. *Avicennia marina* saplings were about 30-35cm tall when planted and grew to 70-80cm in height – almost double. This was similar to the observations of Deshmukh (1994). In third year they are about 180 to 200 cm. Tall.

Thus different varieties of mangroves showed different survival as well as growth rates, which was also observed by Maity (1994). But in general growth was seen better in second year than in first year. Similarly it was also observed that mangroves planted in the beginning of September i.e. just at the fag end of the rainy season showed better survival than which were planted in late September or October. Raddy (1987) also stated that 6 months to 1 year old saplings if planted during rainy season showed good survival, but those uprooted and planted after rains survived less.

CONCLUSION

Thus a NGO can take up planned mangrove plantation activity and make it successful but for this to successful public awareness is important, so that many people can participate in the activity.

According to Kokate (1985) such awareness drives create good impact on the age group 20-25 years. In Thane city the mangrove plantation activity can be taken up on either bank of the creek. Similarly protection of existing mangroves also will help in propagation.

ACKNOWLEDGEMENT

The authors are thankful to every member of HOPE who has helped in collection and plantation of mangrove saplings and watering them, which assisted the plantation process. Authors and HOPE also

acknowledge Godrej Boyce and Mr. Vivek Kulkarni for providing saplings of some mangrove species and also for the continuous guidance.

REFERENCES

- Aksornkoae Sanit 1985, Conservation of Mangroves, The Mangroves: Proc. Nat. Symp. Biol. Util. Cons., Mangroves 99-104
- Andrade L.V., V.V. Basadkar and V.N. Nayak 2000 Biodiversity, Distribution, Ecology and Conservation of mangroves of Chendiya creek. Abst. National Seminar on Conservation of Biodiversity and Coastal Aquaculture, University of Kanwar.
- Deshmukh S. 1994. Ecorestoration of Mangroves- A Case Study. Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD
- Jagtap T.G. 1988 Ecology of mangroves. Mangrove seminar, Ganpatipule, Maharashtra
- Kathiresan K. 1994 Propagation Of Mangroves: Some Considerations, Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD
- Kokate P.S. 1985 The Mangroves: Proc. Nat. Symp. Biol. Util. Cons., Mangroves 335-337
- Maity Subrata 1994 Mangroves and Their Rehabilitation for Conservation. Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD
- Patil A.V. 1988 Mangrove afforestation, Mangrove seminar, Ganpatipule, Maharashtra
- Raddy A.G. 1987 Mangrove Afforestation in Coastal Wetlands. Publ. Jt. Director, Social Forestry Circle, Kolhapur
- Raddy A.G. 1994 Rehabilitating Mangroves in Maharashtra, Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD
- Ranade A. 1988 Significance of Mangroves in Coastal Fishery, Mangrove seminar, Ganpatipule, Maharashtra
- Sawant P.V. 1994 Regeneration of Mangroves, Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD
- Untawale A.G. 1986 How to grow mangroves, NIO, Goa
- Untawale A.G. 1994 Development of an intertidal mangroves nursery and afforestation techniques Conservation of Mangrove Forest Genetic resources- A Training Manual, CRSARD