**Managing Logistics**

**Time**

Forest restoration cannot be achieved overnight. The earlier planning begins, the more likely the project will be successful. If trees are to be grown in a nursery near the planting site, nursery construction and seed collection should begin 18 months to 2 years before the planned first planting date. The example timetable for a forest restoration project included below best illustrates the time scheduling required. It runs from planning to canopy closure.

|  |  |
| --- | --- |
| **Time relative to first planting event** | Action |
| 2 years before | Achieve consensus amongst stakeholders on project plan and implementation. |
| Establish nursery |
| 12-18 months before | Agree on location and extent of plots to be planted in the first year and decide on production schedule for desired species. |
| 12 months before | Start seed collection and seedling production. |
| 6 months before | Perform rapid site assessment and prepare restoration plan.  Check nursery for numbers of seedlings ready for planting. If necessary, obtain more seedlings, from other local nurseries. |
| 2 months before | Begin hardening off seedlings to be planted and contacting volunteer planters. |
| 6 weeks before | Demarcate the boundaries of the plots to be planted. Clearly mark naturally established trees, saplings and seedlings and slash weeds down to ground level. |
| 1 month before | Start labeling seedlings to be monitored, preparing planting materials (poles, mulch, fertilizer etc.). |
| Apply herbicide (glyphosate) to re-sprouting weeds (if allowed). |
| 1 day before | Transport seedlings and all planting equipment and materials to planting site; brief planting team leaders |
|  | Planting event early rainy season (June for northern Thailand) |
| 1-2 days after | Check quality of planting; remove any garbage from the planting site. |
| 1-2 weeks after | Collect baseline data on seedlings to be monitored (health, height diameter etc.) – carbon and biodiversity. |
| During first rainy season after planting | Weeding and fertilizer application every 4-6 weeks, as required. |
| End of first rainy season | Monitor growth and survival of planted trees. |
| Beginning of first dry season after planting | Cut fire breaks; organize and implement fire patrols until the rainy season begins. |
| End of dry season | Monitor growth and performance of planted trees.  Weeding and fertilizer application.  Replace mulch. Assess the need for maintenance planting. |
| 1 year after | Maintenance planting – if needed. |
| 2nd rainy season after | Continue weeding, fertilizer application, as required and |
| End 2nd rainy season after | Monitor growth and survival of planted trees. Monitoring at this time provides the best prediction of likely overall success. |
| Subsequent years | Continue weeding until canopy closure is complete. Monitor recovery of biodiversity and continue monitoring planted trees as needed. |

**Labor**

Forest restoration is hard work, but as with any arduous but worthwhile task, sharing the work amongst as many people as possible, not only lightens the load, but also turns a chore into a social event that is both enjoyable and educational. Involving as many community members in the work also enhances community spirit and a collective sense of “stewardship” of the resulting forest resources.

The amount of labour available is the critical factor determining the maximum area that can be planted each year. Grand reforestation schemes that attempt to replant huge areas often fail because they do not take into account the limited number of local people available to carry out weeding and fire prevention. It is far better to plant small areas every year that can be properly cared for by the labour available, than to plant larger areas and have the planted trees slowly choked by weeds or burn, due to lack of fire fighters and other resources.

Tree planting and aftercare, including fire prevention, are usually organized as community activities. That is, the village committee will request that each family provide one adult family member on each day that work needs to be done. The maximum area of land that can be planted each year will therefore depend on the number of households in the village. As community size increases, an “economy of scale” comes into effect, meaning that a larger area can be planted with fewer days work required from each household.

Although the labour required for most tasks is area-dependent (i.e. the greater the area planted, the more workers required), fire prevention is a notable exception. Teams of 8 or so fire watchers are necessary to prevent fires approaching the areas planted, regardless of the size of the plot (from 1 rai up to about 50 rai). Since fire prevention and suppression requires more labour than all other activities combined, the sharing of fire prevention duties amongst larger numbers of households greatly reduces the labour required from each household. The example detailed below shows how the labour required to replant each rai of forest declines with increasing community size and with increasing total area replanted.

At the outset of any forest restoration project, participants must be aware of the labour required both to plant the trees and to care for them until canopy closure occurs and no further maintenance is required. Project planners must also address the crucial issue of whether labour will be donated voluntarily or whether daily rates for casual labour must be paid. If the latter, then labour costs will dominate the budget. From FORRU’s experience, if villagers truly appreciate the benefits of forest restoration and have strong motivation, they are usually willing to work on a voluntary basis. Because fire prevention generates immediate broad benefits for the whole community, it is the activity most likely to be supported with voluntary labour.

**Some labour requirements are fixed and some are area dependent**

**Area dependent labour**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Person-days labour per rai | | Total labour required for | | | | |
| 1st Year Planting | 2nd Year Maintenance | 1 rai | 5 rai | 10 rai | 25 rai | 50 rai | |
| Site preparation | 4 people/rai | 4 | 0 | 4 | 20 | 40 | 100 | 200 |
| Planting | 8 trees per person per hour over 6-h working day | 10 | 0 | 10 | 50 | 100 | 250 | 500 |
| Weeding and fertiliser application | 4 people/rai 4 times in first year 3 in 2nd | 16 | 12 | 28 | 140 | 280 | 700 | 1400 |
| Monitoring | 2 people/rai (optional?) | 6 | 4 | 10 | 50 | 100 | 250 | 500 |

**Area independent work**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 1st Year Planting | 2nd Year Maintenance | 1 rai | 5 rai | 10 rai | 25 rai | 50 rai | 1st Year Planting |
| Fire break establishment |  | 100 | 100 | 200 | 200 | 200 | 200 | 200 | 200 |
| Fire prevention /fighting teams. | 90 days; 8 people per day; taking care of UP TO 50 rai | 720 | 720 | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 |
|  |  | 856 | 836 | 1692 | 1692 | 1900 | 2160 | 2940 | 4240 |

**Labour requirements per household**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Person days | | No. person-days required per household in communities of x households over 2 years | | | |
| Area planted (rai) | Per Rai | Total | 10 | 50 | 100 | 200 |
| 1 | 1692 | 1692 | 169 | 34 | 17 | 8 |
| 5 | 380 | 1900 | 190 | 38 | 19 | 10 |
| 10 | 216 | 2160 | 216 | 43 | 22 | 11 |
| 25 | 118 | 2940 | 294 | 59 | 29 | 15 |
| 50 | 85 | 4240 | 424 | 85 | 42 | 21 |

# Budget

The budget for restoration depends primarily on the balance between assisted natural regeneration (cheap) and tree planting (expensive). To determine this balance, first perform a participatory rapid site assessment (RSA), involving all stakeholders, according to the instructions here:

<https://www.forru.org/advice/restoration-strategies>

Next, download the budget calculation spreadsheet and perform a “collaborative costing”, involving all stakeholders, particularly the funder. Project the spreadsheet on a screen, enter the number of trees that should be planted (derived from the RSA) – adjust the other cost parameters to local rates (according to feedback from stakeholders) and enter the area to be planted. Discuss other unit costs with the whole group and enter accordingly. Look at the bottom line and if necessary, negotiate with the funder where cost savings can be made. This is the link for the spreadsheet.



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