# Training Module No. 11

## One Day Training Programme on ANR without gap and Silvicultural Operation

**Date :_____** **Venue**: Preferably the treatment area

**Registration of Participants (30 Minutes Prior to the Start of First Session)**

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**Participants: 30 Persons**

- Team members of Partner NGOs
- Working group members of VSS involved in direct implementation,
- Concerned forester and forest guard

**Objectives of the Training**

The objective is to enhance and improve conceptual and practical knowledge on Aided Natural Regeneration and various Silvicultural operations to be carried in the ANR sites.

**Training Outcomes**

1. Participants will have clear understanding of various steps involved in Aided Natural Regeneration and various Silvicultural operations.
2. Enable the participant to undertake Aided Natural Regeneration and various Silvicultural operations involved in forest management in the VSS treatment area.

**Pre-requisite for this Training:**

- The VSS members/Field officials should be selected prior to the training.
- Micro plan should be ready with information area to be treated.
- A demonstration site for the ANR without gap should be identified for the training.

**Training Methodology**: On the site demonstration of ANR techniques.

**Materials and Aids Required**

Spades, (small & large), pick axes, Wooden hammer, Ropes, plastic or steel tape, Wooden pegs, Khurpa, sickle, Axes, Wooden planks, stones, bamboo splinters.

**Details of Session Plan**

| Duration (Min) | Key Steps/ Key activities | Method | Aid/ Materials Required |
|---|---|---|---|
| **Session 1: Introduction** | | | |
| **40** | **1. What is Assisted Natural Regeneration?**<br>**1.1 Natural regeneration.**<br>**1.2 Community approach.**<br>**2. Why Practice ANR?** | Discussion , Lecture/Interaction | • Field note book, Pen etc. |
| **Session 2:** | | | |
| **60** | **3. Constraints of ANR**<br>**4. Steps Involved in ANR**<br>**a) Clarify goals and objectives**<br>**b) Select appropriate sites**<br>**c) Protect the area from fire and grazing**<br>**d) Identify and mark woody plants**<br>e) **Ring weed.**<br>**f) Suppress the grass layer throughout the site**<br>g) **Thinning and pruning** | Lecture/Interaction and Field demonstration | • Field note book, Pen etc.<br>• Handouts<br>• Dry-wipe Board with Markers |
| **Session 3:** | | | |
| **20** | **5) Choosing sites and strategies** | Lecture/Interaction and Field demonstration | • Field note book, Pen etc.<br>• Field equipments<br>• Handouts<br>• Dry-wipe Board with Markers |
| **Session 4** | | | |
| **50** | **6) Implementation** | Lecture/Interaction and Field demonstration | • Field note book, Pen etc.<br>• Field equipments<br>• Handouts |
| **Session 5** | | | |
| **20** | **Maintenance of ANR Site** | Lecture/Interaction | Field note book, Pen etc. |

| | | | |
|---|---|---|---|
| **Session 6** | | | |
| **20** | **5) Documentation of cleaning materials obtained.**<br>**a) Enumeration of high stumps**<br>**b) Stacking of Firewood**<br>**c) Disposal** | Lecture/Interaction and Field demonstration | • Field note book, Pen etc.<br>• Field equipments<br>• Handouts |
| **30** | **Group interaction and questions from participants** | Discussion | |
| | | | |
| **Feedbacks and vote of Thanks** | | | |

# Course Materials

**Session 1:**

**Introduction**

Degradation of forests continues to cause serious problems worldwide and deforestation now is the second largest source of greenhouse gas emissions, A variety of measures have been tried to address these problems at different levels, with varying degrees of success, the more recent being the options around Reducing Emission from Deforestation and Degradation.(REDD+) Countries around the world have also shown their ingenuity in manipulating forests and ecological succession to reverse the process of deforestation.

1. **What is Assisted Natural Regeneration?**

Assisted natural regeneration (ANR) is a flexible approach to reforestation i.e.

- Uses natural regeneration of forest trees ("wildlings" or natural seedlings, and sprouts).
- "Assists" natural regeneration by preventing fire and helping trees grow faster in other ways. ANR is sometimes called "Accelerated natural regeneration."
- Additional plant when needed or wanted (enrichment planting) sometimes in ANR with gap plantation.

**1.1 Natural regeneration.**

It is the renewal of Forest crops by seed sown or by coppice or root sucker. When regeneration obtained from seed forms a crop, it is called seedling crop. It is defined as a crop consisting of seedling neither planted nor of coppice or root sucker origin but originating in-situ from natural regeneration. ANR also stimulates new natural regeneration from seed from nearby natural forest. In both cases, by using naturally occurring trees, ANR avoids the problem of matching species to the site. The encouragement of these species can help restore a diverse native forest.

**1.2 Community approach.**

Assisted natural regeneration has been successfully implemented in village projects on communal / public lands/ forest land. Full community participation is necessary to prevent fire. ANR has been used in programs giving villagers legal tenure on national lands, in return for the assistance of the villagers in converting grasslands and mixed brush lands into forest. ANR techniques can also be used on individual farms, especially for fallows and agro forests. The key element of ANR is to control fire, restrict grazing, suppress the weed growth and involve the local people.

2. **Why Practice ANR.**

Assisted natural regeneration (ANR) is a simple, low-cost forest restoration method that can effectively convert deforested lands of degraded vegetation to more productive forests. The method aims to accelerate, rather than replace, natural succession processes by removing or reducing barriers to natural forest regeneration such as soil degradation, competition with weedy species, and recurring disturbances (e.g., fire, grazing, and wood harvesting). Compared to conventional reforestation methods involving planting of tree seedlings, ANR offers

significant cost advantages because it eliminates the costs associated with propagating, raising, and planting seedlings. It is most effectively utilized at the landscape level in restoring the protective functions of forests such as watershed protection and soil conservation. ANR techniques are flexible and allow for the integration of various values such as timber production, biodiversity recovery, and cultivation of forest crops, fruit trees, and non-timber forest products in the restored forest.

Where the ANR approach has been implemented successfully, grasslands/degraded land develop into secondary forest. Compared to conventional reforestation with a single tree species, the ANR without gap approach may have social, environmental, and cost advantages. Depending upon the site, it has the potential to:

- Regeneration of degraded forests and converting grassland to forest.
- Involve local people in developing a forest that meets their needs, to motivate them to conserve it.
- Reduce total reforestation costs, because there is no site preparation, nursery establishment, and enrichment planting.
- Fit well with farmers' cropping schedules, because ANR concentrates on maintenance instead of planting.
- Provide local employment, if there is outside funding. Most expenses are for local labour.
- Develop a forest with many species, especially native species. This benefits wildlife habitat and reduces the risk of severe damage from pests and diseases.
- Reclaim land for long-term timber production, since it assists natural woody species.
- ANR includes soil moisture conservation which reduces soil erosion and protects the soil.
- Quickly restore forest cover to watersheds. The secondary forest is likely to be multi-storey, including shrubs and herbaceous plants.
- Multi-storey forests control soil erosion and increase the amount of rainfall going into the ground. Restoration may take 2-7 years.

## 3. Constraints of ANR

Here are some problems that can prevent ANR from succeeding, together with possible solutions.

Lack of community participation:- Plan the project with local people.

Conflicting laws and regulations:- If communities are not legally allowed to own, enter, or manage their surrounding forests, then the community will not cooperate with fire prevention and maintenance for ANR.

**Poverty:** Local people must provide for their short-term needs. Their time and possibly the ANR area is needed for food production

**Labour scarcity:** ANR activities are labour intensive. Labour often becomes a limiting factor, since ANR is usually applied in remote forest areas with low population densities. There should be realistic in estimating labour availability.

**Inadequate extension:** Because ANR activities are spread throughout the year, project staff cannot supervise all activities, and must put more responsibility in the hands of villagers. The local is required to be trained for ANR techniques for better implementation.

**Lack of staff support:** Experience with successful ANR implementation can help to build staff confidence and support.

## 4. Steps Involved in ANR

These steps of ANR implementation are based on experience but can be adjusted depending upon the sites, resources available, and project and community objectives.

a) Clarify goals and objectives.
b) Select appropriate sites.
c) Protect the area from fire and grazing.
d) Identify and mark woody plants.
e) Help existing woody plants grow faster.
f) Continue to suppress grass.
g) Thinning and pruning.

### a) Clarify goals and objectives

Be sure that the goals and objectives of any ANR without gap component of the scheme are clear before it begins. ANR is a technology that may be used by the communities on their own, degraded forest area but ANR may also be promoted and subsidized by a regional or national program addressing watershed or timber goals. Broad goals must be negotiated and agreed upon between the community and those providing assistance from outside. Not all goals are compatible, and misunderstanding must be avoided.

### b) Select appropriate sites

Work in communities that are interested in ANR. Work first with villages or communities that have objectives that can be achieved with ANR, and are willing to organize them to prevent fire. Work on lands that the village/VSS identifies. Choose sites that match the objectives and as per prevailing working plan prescription. Also choose objectives that match the sites.

| Sl. No | Site | Objectives |
|---|---|---|
| | Areas accessible to villages, where villagers have tenure or harvest rights | Produce forest and tree products for local use and sale. |

| | | |
|---|---|---|
| | Areas bordering villages or where shifting cultivation is practiced | Improve fallows.<br>Use land for agroforestry in the future. |
| | Steep slopes | Reduce fire threats.<br>Reduce flow of water from area during the rainy season by SMC activities. |
| | Areas subject to erosion because of regular burning of grass cover | Reduce soil erosion and siltation.<br>Reduce flow of water from area during the rainy season by implementing SMC activities. |
| | Areas in or near national parks, game refuges and nature reserves | Restore native forest species.<br>Improve wildlife habitat. |

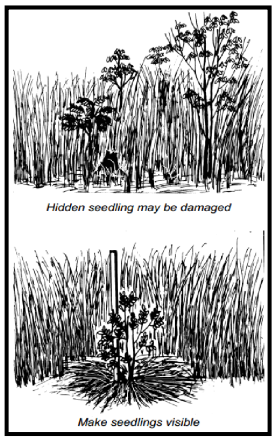
The ANR work is to be started only in areas that can be protected from fire. Consider labour available to monitor and control fire, and plant and maintain firebreaks. Consider the stage of plant succession of the site. If little or no natural regeneration has occurred, conventional reforestation would be as effective as ANR Choose sites with enough natural regeneration already present to meet objectives. Estimate the number of existing woody plants/ha, including seedlings and saplings 15-200 cm tall and choose sites close to forest patches, Gallery forests, forest edges and patches of forest have seed-bearing plants and seed-dispersing animals. This increases the number of new wildlings that can come into the ANR area. Soil conditions may also be more favourable near forest patches. Grasslands that are far from any remaining forests, and grasslands that have been burned and grazed for a long time, do not have enough natural regeneration to make ANR successful. After choosing the site, there must be proper understanding about the local people, the history of the area, local species, and local soils and rainfall.

c) **Protect the area from fire and grazing**

The most critical step in ANR is protection of woody plants from fire. 99% fire is man-made. Since ANR is often implemented by communities, the VSS should constitute groups for fire control. Prevention is better that cure. Fire is the major predicament in success of ANR activity. It damages the regeneration, and damages the soil profile, the undergrowth & the herbaceous and tuber crop. The VSS members should ensure that no fire incidence takes place during the fire season. At least a month before the dry season begins, make plans and organize fire fighting crews. Review plans and roles when dry season begins. During the dry season, patrol the ANR area to locate fires. The question of grazing in ANR areas must be addressed by the community. Animals may eat or trample woody seedlings and saplings, which is to be checked.

**Session 2:**

d) **Identify and mark woody plants**



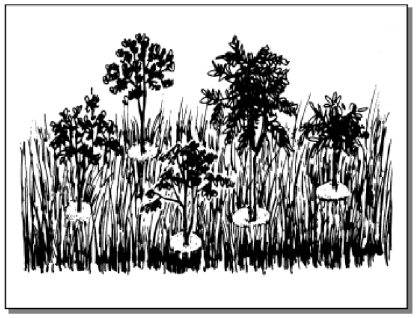

All existing woody wildlings hidden in the grass should be located and clearly marked in order to protect them during grass pressing and clearing. This can be done by two workers, first marks the wildlings with a stake, and the second ring weeds or presses the grasses and weeds with his/her foot. Use stakes only if they are available on the site. Do not cut any trees needed to reforest the site. Instead, make stakes from branches pruned from large trees, stems thinned from stumps of fire-hardy species, stems thinned from dense thickets, or thinnings from forests near the ANR area. When cutting stakes from clusters of stems on stumps and in thickets, cut the smaller stems, and leave the largest stems to grow. If stakes are not available, ring weeding will help make the wildlings more visible.

e) **Ring weed**

It is the most efficient procedure is to:

- Press grass away from the base of the wildling, using feet or a pressing board.
- Pull climbing vines from the trees.
- Slash or uproot ferns, climbing vines, and other weeds within ½ m of the stem.
- Be careful not to damage wildling stems and roots.
- Hand cultivate around the tree, removing grass rhizomes, up to a ½ m diameter.

After ring weeding, the ANR site will look like this. Be careful that ring weeding does not take away shade from wildlings that need shade, such as seedlings of climax forest tree species, especially in the dry season.



Identify and count wildlings in sample plots if this was not already done during site selection. Do this at the same time as marking and clearing. Local people may be very helpful in identifying plants, though with local names.

f) **Suppress the grass layer throughout the site**

After fire prevention and control, the most important activity in ANR is suppressing weeds. Weed must be suppressed efficiently, with minimum use of labour. Usually a combination of methods is used, with cheap and easy methods in open areas and more intensive methods around trees and near forest edges. Native legumes should

be protected and even released from weed competition. They make the soil more fertile and may help suppress weed. Than stimulate the new natural regeneration by way of protecting the area free from fire and weed.

g) **Thinning and pruning**

Where two seedlings or saplings are close enough to each other to compete for light, water, and nutrients, remove the one that is smaller, less healthy, or of a less desirable species. When a tree stump has several sprouts, remove all except the 1-3 largest. Prune branches of nurse trees. Prune nurse trees to gradually increase light for trees and other species that need shade when young and sun when large. Thin the trees as the forest develop. As the canopy begins to close and trees compete with each other, in some cases it is worth the labour to thin trees.

If an unhealthy, branchy, crooked, or worthless tree is interfering with the growth of a healthy, straight, or valuable tree, cut the unhealthy, branchy, crooked, or worthless tree. If trees are crowded, and the thinned trees can be used for firewood or other products, Cut trees that are shorter, smaller in diameter, or less straight. The remaining trees will grow faster and produce superior seed. Thin enough nurse trees to increase sunlight. Be careful not to cut trees that are still needed for shade of shade-tolerant plants or seedlings. Finally, cut plants carefully so that they don't damage other trees as they fall.

**Session 3:**

**6) Choosing sites and strategies**

The ANR without gap approach is different from simple tree plantations because there is wider variety of local native species in forest and the area is to be maintained/ protected in addition to the natural regeneration that is already being present in site. The area may be having variety of micro sites where shrubs and trees provide shade, affect soil moisture, and form windbreaks. Therefore, instead of choosing a single species, try to use several enrichment species matched to different spots within the ANR area if possible. The treatment area is to be properly surveyed and demarcated before implementing the ANR without gap in the forest. The boundary pillars to be posted with mentioning the GPS location, name of the VSS and numbering of pillars etc.

**Session 4:**

**Implementation**

**7)** The different works to be undertaken in ANR as per norm of the Government in a particular area are as follows.

a. Silviculture operation – Congested tress should be thinned out, spared tress to be pruned, top broken to be eliminated etc.
b. Clearance of weed – Undesirable plants interfering the growth of favoured ones (Medicinal Plant, Natural regeneration of principal and Secondary major species and Bamboos etc, to be cleaned deep inside the soil, kept upside down after cuttings in bunches to be burnt after digging pits can be dug and

all cut weeds to be put inside and burnt after drying, all weeding to be done before flowering/fruiting to prevent dispersal of seeds.

c. Climber Cutting- Climbers affecting the favoured Principal and Secondary species are to be cut at several places to give scope for aerial growth/ height growth of species.
d. High stump cutting – Previous coupe areas if any, broken trees etc. without any growth which reduce the value of the forests to be cut flush to the ground to have good coppice for better regeneration and stock of the areas..
e. Singling of shoots – Trees of principal and Secondary species having more numbers at a places should be cut and are promising are to be retained single sound boled trees.
f. SMC Measures: - Loose Boulder check dams(LBCD) or vegetative check dams on small streams from top to bottom (ridge to valley) approach, numbering of LBCD, rill/gully erosion preventive methods, staggered trenches etc, site specific area demanding, slope basis should be intervened.

**Session 5:**

**Maintenance of ANR Site**

**8)** The ANR without gap usually maintained for four years including zeroth year supported by Silviculture operation involving clearance of weeds, cutting of climbers, singling of shoots, soil conservation measure, fire protection etc. Then proper protection measure to be ensured by engaging protection watcher/ VSS members. The journal is to be maintained citing all details like Assigned area, Treatment area, GPS reading of treatment area along with the details year wise expenditure of various activities.

**Session 6:**

**9) Documentation of cleaning materials obtained**

Usufruct like fallen leaves, fodder, broom grass, forest materials, brushwood etc. are to be used as fuel and shall be made available to the VSS members free of costs as per VSS Resolution 2011. There should be a resolution by the villagers for such equitable distribution amongst its members all intermediate yields in the shape of small wood, poles, fire wood etc. as a result of Silvicultural operations and bamboo harvested in VSS shall be made available to the members as decided by Executive Committee of the VSS. If sold, the funds so obtained shall be deposited in VSS accounts.

**a) Enumeration of high stumps**.

An enumeration exercise is required to be conducted for high stumps to find out the location, size, height and their number in a particular VSS. During the process of enumeration, numbering is to be made serially in red colour and enumeration is to be recorded in a register citing name of the species, size (girth & height) and register is to be signed by President & Members Secretary of VSS. Then resolution is to be made

regarding numbers of high stumps which are to be cut during the process of Silvicultural operation. Necessary care may be taken so that the stumps are to be cut by saws flush to the ground so that coppice shoots will grow up.

**b) Stacking of fire wood**.

The Silvicultural cleaning materials are to be stacked at different places to be recorded in the Register. During the process of equitable distribution for domestic consumption as per resolution, necessary transit permit will be issued by the competent authority within the assigned forest area. Proper accounting of the firewood stacks and poles if any will be recorded in Register.

**C. Disposal:**

After domestic consumption, if there is a balance of fire wood or if the villagers don't want fire wood for consumption, then they can dispose the same following due procedure after necessary resolution. A record will be maintained for consumption or sale and the Member Secretary will keep the local Range Officer informed. In case of transportation outside the limit of the village, the permit will be issued by competent Forest Officer on receipt of application from VSS members. The VSS can take the help of M/s. OFDC Ltd. for disposal of forest cleaning materials with the Knowledge of Forest officials as per prevailing rule.

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**Participant 's Feedback**

**Name of Training**: One Day Training Programme on ANR and Silvicultural Operation

Venue:

Date:

1) How far has this training fulfilled your demands?

Completely ☐ Partly ☐ None ☐

2) Please mark your opinions on the contents discussed in the course:

| Sl No | Content | I have achieved a clear concept | | |
|---|---|---|---|---|
| | | Fully | Partly | None |
| 1. | Introduction about the Assisted Natural Regeneration | | | |
| 2. | Identify end mark woody plants thinning and pruning | | | |
| 3. | Choosing sites and Strategies | | | |
| 4. | Natural regeneration and site matching | | | |
| 5. | Implementation | | | |

3) Give √ mark in appropriate box :

| Aspects | Very Good | Good | Fair |
|---|---|---|---|
| Training Room Facilities | | | |
| Quality of Food | | | |
| Lodging Facilities | | | |

4) Mention three things during the course you liked and did not like

| I Liked | I did not like |
|---|---|
| 1. _____ | 1. _____ |
| 2 _____ | 2. _____ |
| 3 _____ | 3. _____ |

5) Of all contents discussed in the course.

You liked most _____

You disliked most _____

4) Give your overall impression about the training with √ mark.

| Very good | | Good | | Fair | | Not satisfactory | |
|---|---|---|---|---|---|---|---|

5) If you have any additional comments, write here.

_____

_____

_____

Signature

Name