



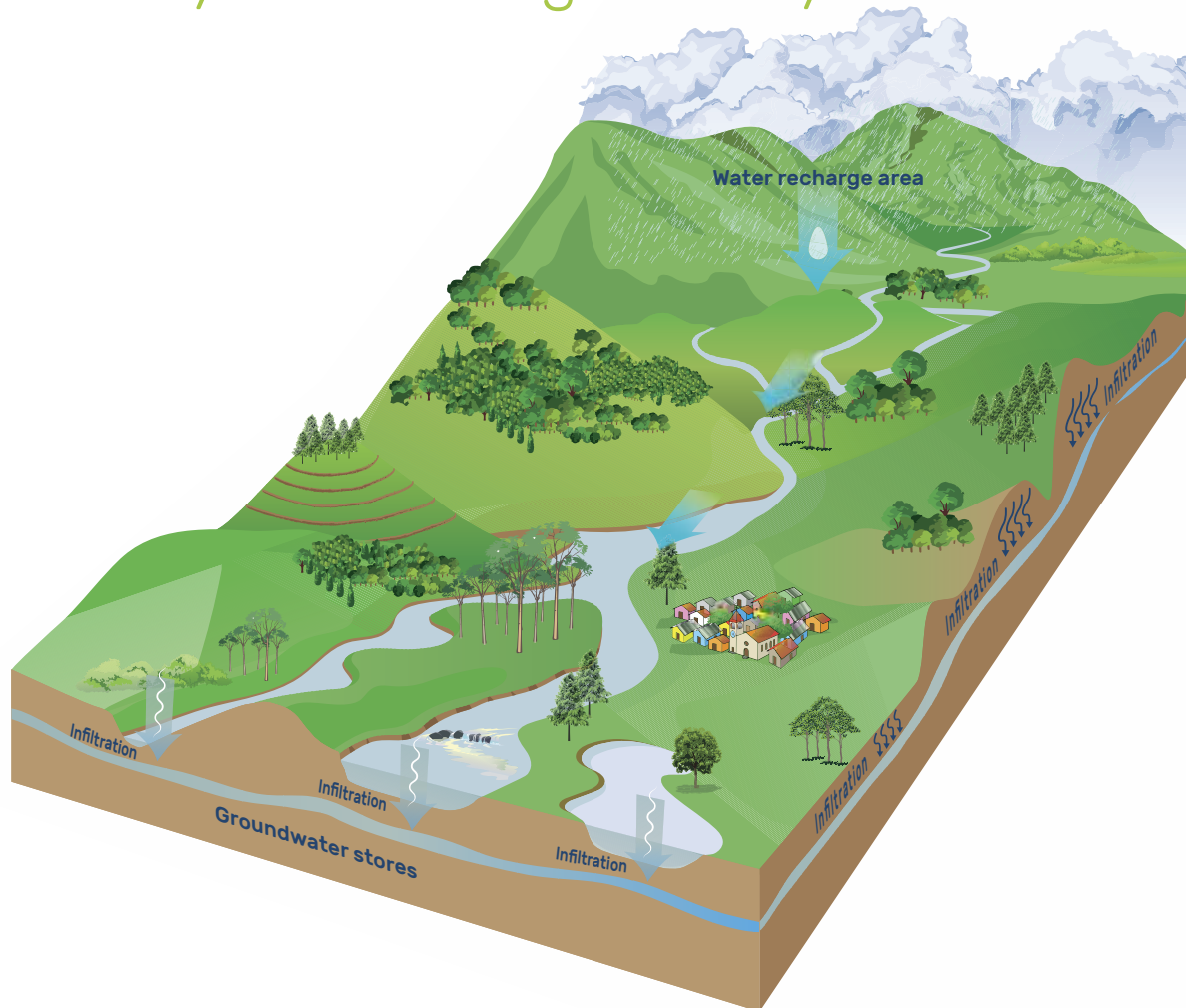
REFORESTATION OF WATER RECHARGE AREAS

Make your learning a lifestyle



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The Integral Committee, represented by **María Gladis Martínez, Inés Irene Beltrán Rosales, Ana Leticia Portillo, María Julia Díaz, Eliceo Benigno and José Baltazar Carbajal**, reflects on the achievements made in organising and learning to defend, protect and conserve the water recharge of the Escondido River in the Buena Vista community of El Salvador (Municipality of Santa Cruz Michapa, Department of Cuscatlán).

Don Inés remembers: "Let me tell you straight. When a close friend who now rests in peace invited me to be part of this community group, I had my doubts,

because working in a group is difficult. It requires patience, caution... you have to see how to solve problems and be sensitive in recognising the dignity of each person... "

Gladis, coordinator of the group and former councillor, shares: "Well, after an exchange of experiences in Nicaragua with CANTERA and FEDICAMP, I was encouraged to found the Environmental Committee with the women of the Agroecological Committee that manage the home gardens.



Being a leader is not easy because it requires putting up with different behaviours and temperaments in the community, but it is worth it.

When a neighbour wants to cut down a tree or burn their land and does not have permission from the State, the Committee visits him: first as a brother, second as a neighbour and third as a Committee... What's the benefit for the hundred families of the community? The Cordoncillo River, which is the same Escondido, is recovering. And our two wells are too... ".

Purpose of reforesting water recharge areas

The conservation of aquifer recharge areas in a catchment area allows the aquifers, water deposits or reservoirs below ground to recharge, and then to emerge or reappear in springs, water sources and wells.

The water recharge areas are the parts of a river basin or catchment area where rain and surface water collect. Some seeps into the ground and some runs-off into streams and rivers.

These areas serve to connect patches of woods, and can become biodiversity corridors for the movement of animal species between patches of vegetation in the fractured landscape.

The areas of greatest recharge are the mountains and the high areas, due to greater rainfall or precipitation, especially when the ground is permeable. Although this infiltration capacity also depends on:

- ✓ The amount of **rainfall**.
- ✓ The type of forest or **vegetation** in the highest parts. When the recharge zone is reforested, it will infiltrate much more water than if it is deforested, cleared or barren.
- ✓ The degree of **destruction of the soil** and **natural resources** on the slopes. In terrains with trees, water infiltrates through the roots.

Step by step: How to protect the recharge areas through reforestation with different species of trees

1. The first fundamental step taken by the Salvadoran Centre for Appropriate Technology, known as CESTA (Friends of the Earth), is to **coordinate the project implementation** with local authorities such as town halls.
2. They agree on a **strategy** to find and select people within the communities of the working territory who are interested in being community promoters and leaders to organise the community and set up the different groups: agroecological and environmental committees.



3. As each group takes shape, it consolidates a **training process** from two angles: one is through workshops and exchange tours in the community to train promoters. The other angle is to train people in the School of Leadership and Advocacy.
4. Identify with the Environmental Committee and people of the community, the **springs, waterholes or watersheds** in the area and pinpoint the most deteriorated areas.
5. **Fence in** the recharge area to protect it from grazing animals, which pollute the waters and destroy seedbeds and forest nurseries and fruit trees. The recommended protected area either side of the river is 20 metres wide.
6. Take advantage of and enhance the **natural regeneration** of trees.
7. Make **not burning undergrowth** a norm.
8. As some municipalities manage **reforestation programs** with nurseries that provide forest and fruit plants to the communities, send written requests as an Environmental Committee.
9. **Select the best species** to reforest the recharge area of the water sources among the families of the



community. Characteristics to take into account:

- ✓ Must not shed leaves. Choose evergreen species.
 - ✓ Should be native to the area.
 - ✓ Retain moisture in the roots.
 - ✓ Produce food or be useful for communities and for wild animals, other plants, insects and any organism that lives in the recharge area.
- 10. Seed collection** of seed trees is not easy. Fruits are diverse: some are dry and others fleshy, and the harvest season happens at different times.

Therefore it is necessary to master some harvest techniques and make an annual plan to collect native seeds to attend to the development of the flowers and the fruits.

Some fruits are picked from the ground and others need to be cut from the tree. The problem is that most forest species grow very high. Some can be climbed to the top, but with others, you must cut the crop with an extension pole or use a stepladder.

Fruits with seeds must be harvested when the seed tree is in full production, not at the beginning or end of production.



Fleshy fruits such as calabash berries, and drupes such as loquat and sapodilla plum, are pulped, rinsed and dried in the shade.

Dry fruits such as pods from the flame tree or raintree, capsules such as Spanish cedar, and cones such as pine, are dried in the sun, flailed, cleaned in the open air and dried in the shade.

Forest tree seeds like any type of bean, maize and vegetable seed should be stored in cool, shaded places and protected against insects.

Equipment and tools needed for a nursery and greenhouse

- ✓ Pruning shears
- ✓ Cone hook for shaking
- ✓ Rake
- ✓ Strings
- ✓ Gloves
- ✓ Extension Pole
- ✓ Stepladder
- ✓ Bags or sacks
- ✓ Glass or plastic containers
- ✓ Machete
- ✓ Map with the location of the trees
- ✓ Seed collection plan





The Environmental Committee of Buena Vista identified: tropical almond, ice-cream-bean-tree, breadnut, inga trees, and parlour palm. As to fruit-bearers, there were mango, citrus and avocado trees.

11. Agree on the type of **agroforestry** and **silvopastoral** systems that are most suitable both for the farms and the water recharge management.
12. **Reforest plots** and farms with trees of different purposes.
13. Start a **seedbed and nursery** for seeds.

To reproduce some species it is necessary to make seedbeds and nurseries to then pass the best-germinated plants to nursery bags and from there transplant in the water recharge area. To start both the

seedbed and the nursery, you must:

- ✓ Select the location and improve the conditions of the place.
- ✓ Prepare a 1 x 1 metre-seedbed with 10 centimetres of soil prepared with fertiliser for the species that require it.
- ✓ Some seeds need: 1. Pregerminative treatment such as soaking, 2. Mechanical treatment with wet sand, or 3. Leave them buried for a while in wet sand, soil or livestock manure.
- ✓ Prepare the filling of bags with two parts soil, one of organic fertiliser or livestock manure and another part sand.
- ✓ Transplant to nursery bags.
- ✓ Plant in the recharge area with holes of 30 x 40 centimetres and deposit 2 kilos of organic fertiliser at the bottom.

- ✓ When removing the bag, be careful not to damage the roots. Make sure you place the plant in the centre of the hole so the plant is at ground level. Then begin to fill the hole with the first loose soil that was removed. Then press down with your hands and then with your feet, so as not to leave air spaces and prevent root rot.

Equipment and tools needed for nursery and transplant

- ✓ Duplex shovel
- ✓ Pick for making holes
- ✓ 1 quintal (46kg) of good soil
- ✓ 1 quintal of compost fertiliser
- ✓ Plastic bags
- ✓ Local soil
- ✓ Strainer
- ✓ Shovel

Costs and difficulties of reforesting a water recharge area

Taking steps to protect, preserve and reforest requires a coordinated management and mission among municipal governments, financing NGO's, local development and farmer organisations, organised community promoters, leaders and citizens, as well as training, planning and investment, which requires lots of resources.

The cost of a forest plant is \$0.45 USD, including bag, substrate and labour. But when you buy the fruit trees in the nurseries the cost is between \$3.00 USD and \$7.00 USD each.



Among the **difficulties** identified are:

- ✓ Lands deforested and compacted by grazing infiltrate very little water.
- ✓ Properties being used to provide construction materials for roads, infrastructures and homes.
- ✓ Properties intended for residential building projects.
- ✓ Little knowledge of the laws that protect the conservation and protection of natural resources.
- ✓ Not understanding the concept of water cycle and catchment area.
- ✓ Little knowledge of reforestation.
- ✓ Lack of enthusiasm to start a nursery.
- ✓ The seedbed, nursery and transplant all require many hours of work.
- ✓ Difficulty in understanding the laws and making people apply them.
- ✓ Some families do not have their own land.

Recommendations to protect water recharge areas as a community

- ✓ Identify, with the help of a technician, the recharge areas that exist in the micro-basin where you live.
- ✓ Carry out censuses of the families living in the water recharge areas. Record number of members, amount of land, crop management and diversity, and state of the property, in order to facilitate the allocation of nursery plants for each family to reforest their land.
- ✓ Develop an annual plan to collect native forest seeds.
- ✓ Through the community organisation, establish family or community nurseries to reforest the community, courtyards, plots and recharge areas.



- ✓ Include in the teaching-learning processes of the training workshops activities such as field tours and community exchanges, pre-germination treatment of forest seeds, germination tests, conservation of seeds and other types of reproduction such as cuttings, buds, roots, layering and grafting.
- ✓ Know the legislative framework of environmental laws, regulations, public policies and programs that comply with effectiveness.
- ✓ Motivate and involve other people.
- ✓ The first two years are a determining factor in establishing losses. It is important to carry out silvicultural management activities such as: fertilising twice a year and knowing when to prune, thin, remove suckers, control weeds, prune for shape, sanitation, prevent pests and diseases.
- ✓ Speak with the owners of the recharge areas to raise awareness of the importance of protecting and reforesting those areas. Involve them in the activities of environmental forums and conventions
- ✓ Organise annual reforestation workdays at the beginning of the rainy season.
- ✓ Persuade local farmers to set aside areas of the farm as natural regeneration areas.
- ✓ The municipal mayor's office must issue ordinances to avoid burning and protect the recharge areas.
- ✓ Maintain and cultivate coordinated management and vision among the municipal governments, the financing NGOs, local development organisations, producers and the organised community, as well as training, planning and expensive high resource investments.



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