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## Forests and water

The relationship between forests and water has long pre-existed the appearance of humans on the planet. Wherever water comes down from the skies with certain frequency, there is a forest. For scientists, forests are ecosystems hosting much biological diversity, both regarding different species and also regarding genes within the same species. They are places dominated by trees, but nevertheless composed also of plants of different species, sizes, ages and forms of life. We find lianas, creepers, ferns, shrubs, young trees and old trees that could tell us of history one thousand years before Christ. This gives rise to the great biodiversity these ecosystems host, as so many different plants provide food to many different animals.

And wherever there is a forest there is water. To start off with this is due to the fact that water is an essential requisite for plants as the process of photosynthesis needs three things: light, carbon dioxide and water. Additionally, forests develop and evolve in equilibrium with the quantity of water available to them –it is perhaps for this reason that once they have developed, they protect it.

Forests provide various factors that generate conditions to conserve water. Firstly: they lower the temperature by providing shade, preventing water from evaporating and migrating to the sky. Secondly: forests capture the clouds making them pass slower over them, leaving more humidity behind them. Thirdly: they improve the soil by making it more absorbent through the incorporation of organic matter, enabling water to filter through and not runoff over the soil. Fourthly: they make water reach the soil more slowly, trapping it in the tree canopy and letting it fall along the trunk, thus giving the soil more time to absorb it, preventing the water from eroding the soil by falling rapidly.

Indigenous cultures are well aware of the relationship between water and the forest. The Mapuche people, who inhabit southern Chile, find spirits-forces that protect water in the native forest. The Gñen-ko, inhabit a sacred place within the forest, the meno-ko, the site where water is born. The Gñen-ko punish those who enter the meno-ko without asking permission, or those who enter without a valid reason, like for instance to extract medicinal plants to cure a sick person.

Lucinda Pichicon, a Mapuche woman, tells us that: *“sometimes, out of need, they have taken plants, trees to sell for firewood, for heating, to make fences, they have taken out and destroyed their small forests. ...and many people have cleared, for example there are institutions that come and (say) that the water must be cleaned, that everything has to be very clean and many Mapuche have cleared the springs where they got their water, clearing and cutting down the trees so the leaves don’t fall into the water because previously the leaves fell into the water but they used to push them away and take out the water. Because they were told that the water was dirty the people cut the trees to prevent the leaves from falling in. And what happened, the water dried up. And then they understood that by taking away the plants the water is no longer there and they do not have any Gñen that produce water”* (1).

When a forest that had developed in equilibrium with local environmental conditions disappears, this equilibrium is seriously altered. The soils and slopes are exposed to erosion agents, of which water is the strongest. It is precisely what best demonstrates the relationship between these three factors.

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Without the forest, water and soil almost mutually repel each other in lands where the topography is not flat. However with the presence of the forest a natural web is generated, enabling water and soil to maintain a closer relationship, coming nearer and staying together much longer.

When the native forest is replaced by plantations of foreign trees, the water-soil relationship is destroyed, this is so because the only trees able to establish a balance between them are those developed according to the characteristics that both factors exhibit in a given location.

A Mapuche man from the Lumaco region, explained:” *Now there is not much menoko because the forestation companies entered everywhere, they surrounded the community; the water decreased...very specially the menoko, the springs. And now as they have planted pine trees and the pine trees are now growing this water has dried up. And the community is rather sad. It is not like the life we had before*” (1).

We know that three-quarters of the planet are cover by water, but for this water to be available to humans there must be sufficient forests to place it at our disposal. If not, we will only see it passing by.

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(1) Excerpt from interviews carried out with *Kimche* (“people with wisdom”) from the Pantano community, Lumaco commune, Province of Malleco, Araucania Region, Chile, for the thesis on “Strategies for restoration of degraded native forest communities in an inter-cultural context.” Parra, A. 2004.