

ASSISTED NATURAL REGENERATION: METHODS, RESULTS AND ISSUES RELEVANT TO SUSTAINED PARTICIPATION BY COMMUNITIES

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ABSTRACT

This paper presents a case study of assisted natural regeneration (ANR) at Kandis village, Puerto Princesa, on Palawan Island, Philippines and discusses the social issues that influence the success of the ANR approach. ANR hastens natural forest regeneration through a combination of fire prevention and weed control. The saplings that emerge as a result are used as nurse trees to foster climax forest tree species and shade-tolerant orchard species.

Despite the successful results obtained with this method, it has not been vigorously implemented. Reasons for this may include an habitual reliance on planting exotic tree species, a lack of understanding about forest ecology, an inflexibility of approach from funding bodies and lack of incentives for rural communities to protect the forests. The community forestry movement has had a positive impact on natural regeneration. Legitimising use of forest products and providing land tenure and appropriate training has enabled communities to find viable alternatives to slash-and-burn agriculture and, in the absence of disturbance, forests have regenerated on degraded fallow fields.

One of the main incentives for communities to protect forests is the desire to maintain water resources through catchment protection. Examples are given of instances where beneficiaries of environmental services provided by forests have made a direct financial contribution to forest conservation.

This paper presents a case study of assisted natural regeneration (ANR) at Kandis village, Puerto Princesa, on Palawan Island, Philippines and reviews social issues that influence the success of the ANR approach.

Kandis is the local name for *Garcinia lateriflora*, a fruit tree that grows wild in the natural forests of Palawan. While the village is named after this tree, the species itself is endangered due to slash-and-burn conversion of forests into upland farms. The project area covers a 1,000 ha catchment within a larger watershed. Ridgelines and a common drainage system define it. About 500 ha are forested. Approximately 250 ha are planted with rain-fed grains, pulses and root crops, a few orchards, some clumps of bamboo and a few irrigated rice terraces. The remaining 250 ha consist of grassland and brush land in fallow, interspersed with patches of degraded forest vegetation.

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Fifty-one families live in the village. Farming, fishing, seasonal employment outside the village and gathering forest products are the principal means of livelihood. Gathering forest products is illegal unless the government issues a permit under the Community Forestry Programme of the Department of Environment and Natural Resources (DENR). However, the procedures are very complex and bureaucratic, including preparation of a boundary map and vegetative cover map, inventory of all available forest products, computation of potential harvest volume on a sustained yield basis, organisation of a co-operative and registration of the same as a legal entity. Kandis does not yet have such a permit, but forest products are gathered surreptitiously while the application is being processed. In brief, conditions at Kandis typify what can be observed in thousands of upland villages in the Philippines, and indeed throughout many tropical countries.

At Kandis, the Bagong Pagasa (New Hope) Foundation, a non-government organisation, is implementing a small forest conservation-cum-rural development project financed by the Government of Japan through the Japan Overseas Forestry Consultants Association (JOFCA). Like most rural development initiatives, this one deals with a range of concerns including improvement of upland farming methods, community organisation, enhancement of skills, better access to markets and so on. Traditionally, the villagers have relied on slash-and-burn agriculture to supply many of their daily needs, but this system is no longer sustainable due to the prevailing land-to-population ratio. Other alternatives must be put in place, otherwise neither agricultural nor forest conservation objectives can be achieved. From the perspective of the funding agency, the principal task is to test methods that can help bring about more effective and efficient use of overseas development financial assistance in forest conservation.

Agro-forestry is a major project component. The project is also investing in reforestation and orchard development on grasslands and brush lands presently in fallow, implementing ANR as a first step in the process. The nurse trees that emerge and are maintained through ANR are used to foster the regeneration of natural forest and are also interplanted with several shade-tolerant crops including coffee, rambutan (*Nephilium lappaceum*), durian (*Durio zibethinus*) and lanzones (*Lansium domesticum*).

ANR combines fire prevention, ring-weeding of naturally-grown seedlings and saplings of pioneer trees and lodging of *Imperata cylindrica*, *Saccharum spontaneum* and other vegetation that competes with the pioneers. After approximately three years of implementation, grass and brush lands are giving way to more permanent vegetation. Thus far, 89 tree species in 37 families have been identified in monitoring plots and transects. These include early growth of several principal species found in undisturbed climax forests. Rapid accumulation of organic matter, earthworm castings, cooler soil temperature and other positive developments provide evidence that forest restoration through natural methods is succeeding.

These results are not surprising. Natural regeneration of forest cover is part of the fallow system that slash-and-burn farmers have practised since time immemorial. ANR merely hastens the process. The challenge is to prevent or at least significantly minimise subsequent interventions that would interrupt the process.

Given the results that are so easily and economically achieved through ANR, one can only wonder why this simple forest restoration method has never received a fraction of the

attention or funding devoted to conventional reforestation technology. More than 25 years ago, some of the Philippines's most highly-respected environmental management scientists recommended adoption of ANR as a principal forest rehabilitation strategy. However, it was only in the early 1990s, after restoration of a democratic system, that the government officially approved ANR as a legitimate component of reforestation programmes. Sadly however, official recognition of the role ANR can play has not been followed by vigorous, widespread and sustained implementation in the field.

Many factors contribute to this unfortunate situation. One of the most serious constraints is a widely held misconception that conventional line-planting reforestation is the only reliable method for restoring forest cover. This view is shared by most sectors of the media, many environmental NGO's, church groups and the general public. Foresters and others attempting to restore forest cover are invariably asked how many trees they have planted. This is often the only acknowledged criterion of success or failure.

The pressure created by this mistaken notion spawns a whole range of problems. Soils in most of the degraded lands that need reforestation are low in fertility, organic matter content and moisture retention capability. Consequently, climax species that the public generally associates with forests and reforestation cannot thrive. These species evolved over millions of years on relatively fertile soil. Attempts at re-establishment on degraded lands almost invariably fail. As an alternative, exotics that can survive degraded conditions are introduced. It would be a waste of time to dwell here on the well-known negative impacts on water retention, wildlife habitat and other environmental values that follow.

Another issue, somewhat related to the one just discussed, is the simple fact that most forestry colleges do not teach comprehensive forest management. The curriculum consists primarily of subjects in timber management and plantation forestry. Young graduates go into the field with little or no understanding of the natural dynamics of plant succession, and little or no appreciation of the benefits that can be realised by working in partnership with Mother Nature. For example, very few are aware of the need to reduce soil temperature, thereby enhancing the proliferation of micro-biota, or of the relationship between these conditions and the potential to achieve success in forest restoration.

However, a misinformed public and poorly trained foresters are not the only problem. With very few exceptions, the tropical reforestation programmes financed by major donors are designed along the lines of an infrastructure project. They are generally characterised by a limited time frame, an unhealthy dose of the human ego that assumes quick fix solutions are possible and the inability or lack of will to follow a process approach.

Furthermore, traditional systems for monitoring the results of forest restoration work are impractical to use in respect of ANR. Recording survival rates after planting has to be replaced with more appropriate methods. Low cost evaluation using satellite imagery is one option. The ITTO has recently produced computer software that can accurately measure change in the forest canopy density through analysis of satellite imagery data. The software is available free or at cost on a compact disc containing a semi-expert system that facilitates rapid, user-friendly analysis. If canopy density, and thus forest cover, have increased, restoration is being achieved. If not, investments in forest restoration are being wasted. Another option is measurement of annual variation in stream flow during the dry season. This is perhaps one of the most useful parameters and one which we will return to later.

Currently in the Philippines, and perhaps in other tropical countries as well, the principal impediment to sustained success in forest restoration in general, and to vigorous implementation of ANR in particular, is the failure to create stable and reliable incentives for rural communities to conserve and sustainably manage the forests. Given the feudal history of many tropical countries, and the colonial systems that followed, governments and government-favoured institutions have generally established systems and policies that explicitly exclude or simply ignore the reality that forests and the human communities residing there are mutually inter-related components of the same ecosystem.

About twenty years ago, these obsolete attitudes started to change. Community-based concepts such as Joint Forest Management in India, Community Forestry in Nepal and Community-Based Natural Resources Management in the Philippines are a few, but not the only, examples. All of these initiatives challenged the feudal notion that responsibility for, and benefits derived from, forest management are the exclusive prerogatives of government and surrogate institutions such as timber concessionaires. In varying degrees, these new programmes sought to grant extraction privileges and allow the use of forest products by communities in exchange for commitment to protect and conserve forests.

Wherever the rhetoric of these programmes has been matched by sincere application in the field, forests are being restored at a rapid pace and the principal mechanism by which this has been achieved is natural regeneration. Legitimising the traditional use of forest products by communities, combined with tenure security, appropriate training and common-sense planning, have created viable alternatives to slash-and-burn conversion. In the absence of fire, forests will inevitably return.

Unfortunately in the Philippines, and elsewhere, there is resistance to the community forestry concept. Professional foresters feel threatened. Governments and vested interests fear the loss of power and perquisites from forest management. In addition, the general public, including many well-intentioned sectors, cannot seem to accept the reality that it is impossible to establish and maintain a virtual iron curtain around the forests wherever prevailing conditions are characterised by rural poverty and high population density.

About ten years ago, a group of senior foresters from the Philippines, Sweden and Finland conducted a nation-wide assessment of the factors that could help overcome the resistance just mentioned. Their conclusions can be summarised as follows. Some sectors are interested in forest conservation and others are not. Some worry about wildlife conservation, while others are not concerned. Some believe in people empowerment and decentralisation, while others oppose any change in the status quo. Many perceive rural poverty as a major impediment to national well being. Others would like to keep the poor where they are because they believe this will make them easier to control.

However, all sectors, without exception, are keenly concerned with the issue of water. Based on their findings, the group conducting the study recommended that water should be the core issue to incorporate in community forestry strategy. Developments over the last few years clearly attest to the validity and soundness of this recommendation.

For example, an upland community, which was granted forest management rights in the northern Philippine province of Cagayan, has offered to rehabilitate an old irrigation system and maintain the forests that sustain the system. However, they insist that lowland rice farmers who use the water should pay them for this work. Concurrently, in the southern

Philippine island of Mindanao, an upland tribal community wants to cut down a monoculture *Gmelina arborea* plantation established by the government, and replace it with a mixture of fruit trees, bamboo and timber species. Lowland rice farmers argue that cutting down the *Gmelina* will jeopardise their water supply. The tribal community contends that a mixed species plantation will improve water retention and supply. The community further points out that the government does not allow them to use the *Gmelina* trees even if they have protected the trees for many years without any compensation. Finally, they maintain that the lowlanders who use the water, produced as a result of community-based forest conservation work, should not continue to receive this benefit free of charge.

In the Philippines, some of the more serious and perceptive members of the forestry profession are taking the position that water, not timber, is the most important forest resource. They and others further contend that long-standing indigenous communities in watershed areas should be compensated for forest conservation work, because this helps ensure a reliable, sustained volume of the water that everyone needs and uses. Whether or not this will eventually result in policies and procedures that create incentives and strong motivation to conserve forests remains to be seen. Thus far, the concept has not encountered anything comparable to the resistance mentioned earlier. In fact, the Department of Environment and Natural Resources (DENR) has recently signed a memorandum of agreement along these lines with the Zamboanga City Water Authority (a quasi-government entity that operates the local waterworks system). The Water Authority has agreed to pay the DENR a fixed fee per cubic meter for the water it distributes and sells to consumers. Payments will compensate the DENR for the work it performs to conserve and protect a 6,000 ha watershed.

There are other examples. For instance, the City of Yokohama has signed a similar agreement with an adjacent prefecture. In Cagayan de Oro City in the southern Philippines, an electric power corporation is lobbying for permission to levy a conservation surcharge per kilowatt hour for the energy it produces from a hydro-electric generating plant. The money will be used to finance watershed management.

There are many hurdles to overcome. Among others, there is an urgent need for solid research that provides the basis for establishing a fair and acceptable price to pay for water under a range of edaphic and social conditions. Hopefully, the examples just cited may be the first steps in a process that ultimately results in broader application of the same concept, with communities playing a major role. Should this happen, natural regeneration may well become the norm, rather than the exception it is at present, in forest management.