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## Mangrove restoration is necessary, mangrove monoculture plantation is not

The December 2004 tsunami that played havoc on several Asian coasts also exposed the level of human-made destruction of protective greenbelts including mangroves along coastlines. The need to re-establish natural protective greenbelts followed suit with quite often failed attempts.

As the organization Mangrove Action Project (MAP) explains in its website, “Much of the post-tsunami effort to restore coastal greenbelts involved simple planting of mangrove seedlings and propagules. There have been numerous failures, already, due to planting of inappropriate species, and in inappropriate locations. Failure occurs, in general, due to a lack of understanding of the restoration site itself”.

The history of the site, the mangrove species that have grown there as long as their hydrological requirements, the depth of the substrate in which they grew, the fresh water inputs to the area or where did exchange of tidal water take place are usually not taken fully into account in standard planting practice which sometimes promotes an afforestation approach which is not mangrove restoration.

A lot of money has been spent in developing mangrove seedling nurseries while neglecting the need to determine the site-specific needs of mangroves at each restoration location. MAP gives the example that “contrary to popular belief, mangroves require some freshwater to grow well, and they are submerged only around 33% of the time. Planting mangroves along an exposed coastline, in too-deep water without fresh water input, is a recipe for failure”.

A recent case of alleged mangrove restoration project at the estuary of Sabarmati, Gujarat, India has been questioned as only being a monoculture plantation. The project is about planting mainly one mangrove species (*Avicennia marina*) on mudflats. However, mangroves do not grow well in mudflats till conditions of hydrology change and mangroves may move into these adjacent wetland areas to colonize them. This occurs when substrate height increases along the shorelines allowing mangroves to migrate into the changing mudflat zone.

MAP’s Executive Director Alfredo Quarto questions the approach: “As sea levels rise, as is the case today, should we not expect mangroves to move upland to the areas behind the present mangrove boundaries -into the salt flats or salt marshes, perhaps? Another question is: how can planting mangroves in a mudflat be likened to mangrove ecosystem restoration, when it is actually ecosystem conversion and afforestation? Aren't mudflats themselves important, productive ecosystem components of a dynamic, interconnecting, intertidal zone, which includes the mangroves, salt flats, salt marshes and mudflats? Don't migratory birds such as wader birds and other species such as mollusks and other marine life have important connections with and dependencies on a healthy mudflat?”

He concludes that “a plantation approach does not restore a viable, biodiverse ecosystem, but instead creates a monoculture. In no way is a mangrove plantation a healthy mangrove ecosystem.”

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There is a better way than promoting monocultures of such a multi-species ecosystem -especially in Asia, where there may well be 20-30 varieties of mangroves found in a single area. The Ecological Mangrove Restoration (EMR) approach is an ecosystem approach that MAP is promoting as a long-term, biodiverse method of mangrove restoration that prioritizes the restoration of the natural hydrology of disturbed areas.

As MAP explains, “Restoring an area's natural hydrology will, in many cases, allow Nature to restore the mangroves via tidal ebbs and flows, transporting mangrove propagules (seeds) for the natural regeneration of a bio-diverse and healthy forest wetland.”

MAP Ecological Mangrove Restoration (EMR) Method promotes an economical and efficient 6-Step approach to mangrove restoration which follows basic natural processes and places the local community at center stage in the restoration and management process.

Government and NGOs should work jointly with local communities to:

1. Understand both the individual species and community ecology of the naturally occurring mangrove species at the site, paying particular attention to patterns of reproduction, distribution, and successful seedling establishment;
2. Understand the normal hydrology that controls the distribution and successful establishment and growth of targeted mangrove species;
3. Assess the modifications of the mangrove environment that occurred and that currently prevent natural secondary succession;
4. Select appropriate restoration areas through application of Steps 1-3, above, that are both likely to succeed in rehabilitating a forest ecosystem and are cost effective. Consider the available labor to carry out the projects, including adequate monitoring of their progress toward meeting quantitative goals established prior to restoration. This step includes resolving land ownership/use issues necessary for ensuring long-term access to and conservation of the site;
5. Design the restoration program at appropriate sites selected in Step 4, above, to restore the appropriate hydrology and utilize natural volunteer mangrove recruitment for natural plant establishment;
6. Utilize actual planting of propagules or seedlings only after determining through Steps 1-5, above, that natural recruitment will not provide the quantity of successfully established seedlings, rate of stabilization, or rate of growth as required for project success.

Compared to the huge and often failed programs supported by World Bank loans and government agencies, MAP EMR small-scale approach has been very successful. As part of post-tsunami recovery, with the engagement of local communities, 580 hectares of mangrove forests in Riau and North Sumatra, Indonesia have been rehabilitated using the MAP EMR Method.

For more information on MAP EMR

see <http://www.mangroveactionproject.org/map-programs/restoration> or contact Alfredo Quarto, e-mail: [mangroveap@olympus.net](mailto:mangroveap@olympus.net)

To learn more about MAP's EMR yahoo e-group and to request to join please visit: [http://tech.groups.yahoo.com/group/emr\\_group](http://tech.groups.yahoo.com/group/emr_group)

