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Rehabilitating Indian wasteland - a role for afforestation

Rehabilitating wastelands in India with plantation activities is not only possible, but in many cases desired by the local population and would lead to positive environmental and socio-economic effects at the local level. The reasons for the slow development of wastelands are a lack of financial resources, low land productivity and scarcity of water. A re-valuation of the environmental and societal value of the trees together with a compensatory scheme for increasing carbon stock and vegetation cover could make an important contribution to the rehabilitation of wastelands.

INDIA is experiencing huge pressure on its natural resources with more than 200 million people being dependent on forests for livelihood. The rapid growth of the Indian economy puts additional demands on forests for infrastructure and industrial development. India has, as a result of successful reforestation programmes and strict conservation policies reversed the deforestation that was threatening the country during the post-industrial period. With forest cover of 21 percent, India is one of the few developing countries that have historically suffered from heavy deforestation that has now started the phase of increasing the forest area and the Government has plans for an even further increase. However, the country is still holds vast areas of land classified as wasteland, meaning that it has a biomass productivity of less than 20 percent of its potential (Ramachandra and Kumar 2003). These areas have in many cases previously been forested and have, due to a mixture of social, economical and environmental factors been abandoned as productive areas. Overgrazing and abandoning of land together with inadequate rains, drive land degradation and increase the wasteland areas. Wastelands are not necessarily unused, on the contrary grazing and marginal agriculture are often found there. In a study by the Indian Government as much as 47 million hectares, or 15 percent of the total geographical area of India, is currently wasteland (NRSA 2005).

The development on Indian wastelands is slow due to lack of financial resources, low land productivity and scarcity of water. Photo: Matilda Palm

About this brief

Focali provides knowledge to Swedish ministries, government agencies and other relevant actors for effective forest management to achieve climate-poverty targets. This brief summarizes the main findings, highlights challenges and provides recommendations within the focal area. This brief is based on Palm, M., Ostwald, M., Murthy, I., Chaturvedi, R. and Ravindranath, N.H. (2010) Barriers for afforestation and reforestation activities in different agro-ecological zones of Southern India. Published in Regional Environmental Change, vol 11 issue 2, pages 423-435

Change is too slow

Implementation of plantation projects as rehabilitation measures on wasteland has generated social, environmental and economical problems. The wasteland is lacking available soil nutrients and in many cases has a shallow soil depth, which is a result of high erosion rates and limited input of organic material. Low soil productivity together with lack of financial means and long investment periods are barriers to the implementation of plantation projects. In the context of ongoing climate change, bringing the prospect of increasing temperatures and less rain, lack of available water is likely to become an increasingly significant problem.

A case study in Karnataka State in southwest India (Palm et al 2010) yielded the following key messages:

- Wastelands are presenting poor environmental preconditions – where lack of water and poor soil quality are the dominating factors for lack of rehabilitation measures.
- There is a lack of financial resources to initiate the plantations needed.
- The key informants are asking for more local involvement in future plantation projects.

During recent years the Government of India has initiated various developmental programs for the rehabilitation of wastelands, including a watershed development program and a desert development program. The aim of these programs is to improve the cultivable land resource base of the country, thereby increasing agriculture production and vegetation cover.

At the same time as the economic and environmental barriers remain, and the government is trying to implement rehabilitation programs, the local stakeholders are asking for more involvement and ability to influence the project. Previous experience with large-scale governmental plantation programs has in many cases alarmed local stakeholders who argue that local involvement in such programmes has been inadequate and the achievements limited. Currently the government has introduced a National Biofuel Policy adopted in 2009, including reforestation of wasteland with Jatropha Curcas, which is expected decrease India's dependence on fossil fuel as well as drive the rehabilitation of wasteland.

Ways forward

How can these barriers be overcome and the rehabilitation process accelerated? When it comes to environmental barriers, a lack of available water can be particularly difficult to overcome. According to data from the National Centre for Environmental Prediction Reanalysis database (NCEP 2006), the areas have become drier and warmer. According to the key informants the irrigation water available today is needed for the agriculture and could not therefore be diverted to new plantations. One option would be to implement sustainable forest management (SFM) and carefully choose species that are drought resistant and can flourish in hardy environments. The choice of species can then address both the water issue and the lack of nutrients and by itself increase the infiltration and organic material in the soils and by that means limit the erosion on the wastelands.

The local stakeholders state that they are interested in, and have the capacity to invest their time and devote land to an eventual plantation project, as they see a plantation on the wasteland as an investment for future needs. Interviewees stressed the importance of including local stakeholders in the decision and management process repeatedly during the conduct of the case study research.

Local involvement could, for example, include the right to influence which tree species are planted, decision of management practices and harvest schemes. Although local stakeholders were able to clearly identify the environmental and socio-economical benefits of rehabilitating wasteland, funding for such rehabilitation is not available locally. This suggests that special efforts needed to overcome the financial barriers.

The wastelands in this study are in most cases unsuitable for agricultural purposes and would instead be better suited to plantations; however, this does not mean that this is the only option for landless farmers to generate income. The framework for income generation from land rehabilitation plantation project can in both in theory and in practice be very different.

The modelling in the study showed that a compensatory scheme for increasing carbon stock and vegetation cover could be one potential way to overcome these barriers and increase the areas for rehabilitation plantations (Palm et al 2010). The price per unit, however, needs to be drastically improved from the current price for forest carbon credits of app. 5 US$/tC.

Since the reforestation of wasteland generates benefits for the public good from local to global level, it could be argued that some of the costs should be covered by national means or international aid. To some extent, this is already happening in India, with its large reforestation program and intentions to intensify production of bio-energy on wasteland. Previously, well-established institutions such as the nationally implemented Joint Forest Management programme have failed on several certain occasions due to the fact that returns from these plantations have been very low. However with a financial return, either from carbon sequestration or payment for other environmental services, communities and local institutions would take active interest in the maintenance of the wasteland rehabilitation.

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Financial drivers to aid rehabilitation of wastelands

Are there potential financial drivers to aid rehabilitation of wastelands? The question one can ask is then, in what form should these market-based mechanisms be designed and what is realistic?

- Should they follow the route of Clean Development Mechanism (CDM) or Voluntary Emission Reductions (VER), where the carbon sequestered is transferred into carbon credits to be sold on the international market?
- The Payment for Environmental Services (PES) approach is a feasible option, with the environmental service given a monetary value and the function of that same service sold to the ones benefiting from the service.
- Another option would be to have India join the now increasingly popular REDD+ mechanism where developing countries could be compensated for slowing or stopping deforestation (the scheme now includes SFM and increasing forest carbon stock).

Newly planted Eucalyptus on previously degraded wasteland. Photo: Matilda Palm

Focali consists of representatives from:

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