

Combating desertification implies managing the land to enhance its potential to sequester CO₂, cool the globe, reshaping the geography of food security and reducing environmental refugees.

Writing on the negative consequences of desertification, land degradation and drought, a famous author once described the human tragedy of desertification in memorable terms:

"And then the dispossessed were drawn west...families, tribes, dusted out...homeless and hungry; 20,000 and 50,000 and a 100,000 and 200,000. They streamed over the mountains, hungry and restless, restless as ants, scurrying to find work to do...anything, any burden to bear, to find food. Like ants scurrying for work, for food, and most of all for land."

John Steinbeck in *Grapes of Wrath* 1939

Making the case of the land as carbon sink

The physical characteristics of any given piece of land tells a story of how the ecosystem supported by that piece of land works as determined by its soil properties. Those soil properties determine whether that piece of land has the potential to store enough water to keep plants growing through a drought or to withstand a flood. More importantly the soil properties determine the different capacities of the land to act as a store for carbon that has direct implications for capturing greenhouse gases. The world's soils hold more organic carbon than that held by the atmosphere as CO₂ and vegetation. Thus, relatively small changes in the flow of carbon into or out of soils have significant effect on a global scale.

The role of the soil in capturing and storing carbon dioxide is often one missing information layer in taking into consideration the importance of the land in mitigating climate change. The land has an unparalleled capacity to hold carbon and to act as a sink for green house gases making it imperative to focus on activities that enhances rehabilitation, protection and sustainable management of degraded lands. Over the years, most efforts to manage greenhouse gases have involved planting trees, since the amount of carbon that can be sequestered in this way is substantial.

Other methods of managing carbon such as pyrolysis of waste biomass also generate fuels and biochar (charcoal) recalcitrant against decomposition. The process of pyrolysis or carbonization is known globally and can be implemented at small scale (e.g. cooking stove) as well as at large scale (e.g. biorefinery). Recent studies suggest that the use of biochar for improving soils with low carbon sequestration capacity and previously carbon depleted soils (especially in the Tropics) enhances and maintain soil fertility of infertile soils, transforming them into long term SOC rich soils even in environments with low carbon sequestration capacity.

However, more attention should be placed on combating desertification and land degradation as ways to increase carbon sequestration in soils. Soils are the largest carbon reservoir of the terrestrial carbon cycle, and they are a very significant source and sink for green house gases depending on land use management. The land provides a long-term carbon sink where organic carbon can be stored in forms and in locations in the soil profile with slow turnover.

DLD and Food security

Combating desertification and rehabilitating degraded lands does not only enhance the capacities of the land to sequester carbon, but also enhances the potential of the land to increase food and fiber production. The world faces a situation of growing widespread lack of food security seemingly caused by unprecedented price hikes for basic food commodities. There is a chronically severe food crisis among the poor in the regions that are mostly affected by desertification, land degradation and drought in South Asia and sub-Saharan Africa.

Basically, hunger in these countries is not a result of high international food prices but a consequence of local level conditions that result in low agricultural productivity, especially arable land degradation, desertification and climate change related frequent and severe droughts and the intricately related rural poverty. Available evidence indicates that the geography of poverty, impoverishment, food insecurity and malnutrition often coincides with that of desertification, land degradation and climate change related drought.

The phenomenon of land degradation, desertification and drought or water scarcity has major bearing on the potential of the arable lands to produce adequate food and on the availability of water for agricultural purposes and hence on the geography of hunger, starvation and malnutrition. Consequently, combating desertification and rehabilitating degraded lands restores the viability of arable lands and improves soil fertility and its agricultural productivity that subsequently enhances food production and food security. The processes involved in combating desertification result in the rebuilding of the biophysical foundations of a sustainable natural environment – biodiversity, forests, livestock, soils, water, and natural ecosystems- and boost the productivity of the land, sequestration of carbon and sustain the adequacy of food and its availability, thus enhancing food security.

DLDD and forced Human Environmental Migration

Desertification is a fundamental cause of famine and food insecurity. It deepens poverty and undercuts economic growth. It provokes forced human migration and creates environmental refugees. Desertification can exacerbate ethnic and political tensions and contribute to conflict. In some countries, soil erosion and degradation has led to massive internal migrations, forcing whole villages to flee their farms for already-overcrowded cities.

A recent study by the United Nations University suggests that desertification is the greatest environmental challenge of our times and some 50 million people may be displaced within the next 10 years as a result of desertification, land degradation and drought. In addition some one-third of the Planet's population is threatened by expanding deserts. The process of desertification and land degradation is the ultimate end result of most poor environmental stewardship; a synthesis of climate change and land clearing that quite literally makes the Earth a burning hell.

Enough fertile land could turn into desert within the next generation to create an “environmental crisis of global proportions,” large-scale migrations and political

instability in parts of Africa and Central Asia unless current trends are quickly stemmed. Already at the moment there are tens of millions of people on the move. There is internal displacement and international migration and those who end up on boats to Europe are just the tip of an iceberg of environmental refugees.

There are a number of causes, but by and large, in sub-Saharan Africa and Central Asia this movement is triggered by land degradation, desertification and drought. Consequently, the international community has one option; to focus attention on combating desertification and rehabilitating degraded lands. Combating desertification and rehabilitating degraded lands presents the most important and effective ways for mitigating climate change as well as bringing about the resilience of the inhabitants of the drylands and enhancing their potential to adapting to climate change.

DLDD and International cooperation on Adaptation

Activities to combat desertification are mostly undertaken on the land to boost the productivity of the land and guarantee the availability of all other resources with a view to enhance sustainable development and eradicate poverty. Although the approach, more often than not, is preferred without specifically targeting the need to mitigate and enhance capacities to adapt to climate change; the end results invariably mitigate and enhance the potentials of the inhabitants of the drylands to adapt to the changing climate.

The desired end results of combating desertification and rehabilitating degraded lands such as availability and secured water resources, agriculturally productive land and increased food productivity and security, sustainable rangelands and improved livestock production, sustainable wildlife management and utilization, among others, all mitigate the effects of and reduce the vulnerability and enhance the capacities of the inhabitants of the drylands to adapt to climate change. Thus, the process of combating desertification and rehabilitating degraded lands simultaneously improve the productivity of the land, addresses climate change and create a livelihood for people who are poor, making it a win-win situation.

Consequently, where inhabitants of the drylands have to grapple with vulnerabilities associated with the effects of land degradation and desertification on one hand and climate change on the other, combating desertification becomes the most appropriate vehicle which should be given priority on evaluating options to be undertaken. Combating desertification is synonymous with undertaking sustainable development and mitigation of and climate change adaptation responses are closely linked to sustainable development activities, making it imperative to prioritize combating desertification when undertaking climate change adaptation and mitigation actions.

Proposed awareness and advocacy actions

It is imperative to raise awareness on the role of the land on mitigation and adaptation to climate change. The basic intention is to have the issue of land degradation, as it relates to climate change, on the discussion table of Parties to UNFCCC and ultimately have the COP to the UNFCCC adopting decisions that focus on

addressing/reversing land degradation as an effective way of mitigating climate change. Concurrently, the envisaged UNFCCC COP decisions should enable countries to develop programmes of work that synergistically implement the Rio Conventions through rehabilitating degraded lands and bringing them back into sustainable productivity.

Thus, the case that DLDD and climate change are parts of the same equation should be made so that decisions of the COP could provide an integral policy framework, that constitute an adequate instrument for achieving the 4 strategic objectives of the UNCCD as indicated in decision 3 COP8: To improve the living conditions of affected populations; to improve the condition of affected ecosystems; to generate global benefits; and to mobilize resources to support implementation of the Convention through building effective partnerships.

In this regard, the global carbon trade market must be made accessible to land managers, especially in the drylands where sustaining SOC and soil fertility is most challenging and CO₂ emissions are highest as a result of land use change, land degradation and desertification. In tandem, all stakeholders need to engage in the dialogue for the post 2012 climate regime. Combating desertification and rehabilitating degraded land will go a long way in promoting the SOC restoration as one of the significant adaptation tool to climate change, in addition to sequestering carbon. This further creates a strong linkage between the three Rio conventions as it simultaneously addresses climate change, desertification and biodiversity. In addition, from the IPCC perspective, biochar management would be a valid carbon sink in the current and post 2012 LULUCF guidelines.

Required policy actions

The following policy actions are urgently required:

1. Raising awareness on the role of the land on mitigation and adaptation to climate change so that the issue of land degradation, is placed on the discussion table of Parties to UNFCCC and COP decisions are taken that focus on addressing/reversing land degradation as an effective way of mitigating climate change
2. Calling for the inclusion of biochar in the CDM mechanism along with currently already included afforestation and reforestation with a view to subsequently achieve the revision of the additionality rules in order to take into account the fact that biochar is a permanent means of carbon capture that has more value than the potentially reversible afforestation and reforestation.

In order to achieve this, the issue of land degradation, the role of the land as organic carbon sink and particularly the biochar sequestration option need to be introduced by one or more countries through the UNFCCC Subsidiary body for scientific and technological advice (SBSTA) meetings or the COP. There is therefore a need to identify appropriate stakeholder Parties of the UNFCCC. These stakeholders should be assisted in developing a draft decision that articulates items 1 and 2, which could be done targeting the remaining opportunities to include these initiatives in the "post 2012" climate change negotiations.

Acronyms

CDM	Clean development mechanism
COP	Conference of the Parties
DLDD:	Desertification, land degradation and drought
IPCC	Inter-Governmental Panel on Climate Change
LULUCF	Land use, land use change and forestry
SOC	Soil organic carbon