

2009

UN-REDD in Tanzania

*Project on Reducing Emissions from
Deforestation and Forest Degradation in
Developing Countries*



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Citation:

Chiesa F., Dere M., Saltarelli, E., Sandbank, H., 2009. *UN-REDD in Tanzania. Project on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries. v1.1*. Johns Hopkins School of Advanced International Studies, Washington DC and UNEP World Conservation Monitoring Centre, Cambridge, UK.

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Preface and Acknowledgements

When we chose Tanzania as our case-study for the analysis of the United Nations program to Reduce Emissions from Deforestation and forest Degradation (referred hereafter as UN-REDD, being a REDD initiative developed by the UN Environment Programme (UNEP), the Food and Agriculture Organization (FAO), and the UN Development Programme (UNDP)), we asked ourselves the following questions: is it possible at all to reduce deforestation in a country which relies almost entirely on biomass for its energy needs and whose economy overwhelmingly relies on agriculture? Is it possible to combine anti-deforestation strategies

with poverty-alleviation ones? What are the likely social consequences of a program such as UN-REDD in one of the world's poorest countries?

In a way, we felt that if UN-REDD can work in the Tanzanian case, then it could have good prospects in other developing countries with comparable economic, demographic, and ecological conditions. While recognizing the specificity of each country, we thought that some of the lessons from the Tanzanian case would help international policy-makers make better decisions on REDD, including UN-REDD.

It is our hope that the following report will answer some of our initial research questions and that it will prove useful to the reader interested in the prospects of REDD, both in Tanzania and around the world. Section I looks at the role and value of forests in global climate change mitigation efforts. Section II introduces UN-REDD specifically, highlighting its rationale and potential. In Section III, we introduce Tanzania as our case-study, describing its main environmental and social characteristics, and the severe deforestation that the country has historically experienced. Section IV describes the main drivers of deforestation in Tanzania (biomass consumption, agricultural expansion, infrastructure development, and timber harvesting); the section also elaborates on the possible social consequences of tackling these sources of deforestation. In Section V, we analyze the direct obstacles that the implementation of UN-REDD in Tanzania is likely to face, namely institutional inefficiencies, governance constraints, and unclear land tenure arrangements. Section VI then proposes some countermeasures both to the drivers of deforestation and to the obstacles for the effective implementation of UN-REDD. Finally, in Section VII, we conclude by drawing some lessons from the Tanzanian case-study that can be globally applicable in the debate over REDD.

We found many of the answers to our questions during our research trip to Tanzania in January 2009. The numerous interviews and conversations we had with representatives of NGOs and international organizations, government officials, university scholars, and local villagers immensely helped us gain a better understanding of the situation. The information and knowledge acquired through interviews was integrated with desk-research, conducted both prior to the trip but more extensively thereafter, according to the indications and suggestions received on the ground.

To all those who helped us along our efforts goes our deepest gratitude. Mr. Barney Dickson of the UNEP World Conservation Monitoring Centre (WCMC) gave us the

opportunity to undertake this highly interesting project with a high degree of freedom. Mr. Gerald Kamwenda of the Forestry and Beekeeping Division (FBD) of the Ministry of Tourism and Natural Resources of the Government of Tanzania encouraged us in the analysis of the Tanzanian case, both when we met with him in Washington and at his office in Dar es Salaam; we also thank the entire staff of the FBD for the most useful discussions. Francis Sabuni, executive director of the Eastern Arc Mountains Conservation Endowment Fund (EAMCEF), heartily welcomed us to the Fund's site. Charles Meshack, executive director of the Tanzania Forest Conservation Group (TFCG), introduced us to the most topical issues surrounding the Tanzanian debate over REDD and kindly helped us organize our project visits. During these visits, the staff of TFCG, Care International, and WWF Tanzania tirelessly assisted us logistically, translating for us during village meetings and sharing their knowledge with us in our interactions. All the villagers we met on the Eastern Arc Mountains received us open-heartedly to their village councils' meetings and proudly showed us the main activities of their villages. The staff of AGENDA and WWF Tanzania gave us very useful feedback during discussions at their offices in Dar es Salaam, while ARD staff shared with us useful insight on land tenure issues at their offices in Arlington, Virginia, U.S.A.

We are also intellectually indebted to Ivar Jørgensen of the Norwegian Embassy and Christian Peter, Senior Natural Resource Management Specialist at the World Bank, Dar es Salaam. Dr. Zahabu and Professor Munishi kindly met with us at the beautiful Sokoine University campus in Morogoro. Professors Lokina and Kahyarara of the University of Dar es Salaam engaged us in a most useful seminar-style discussion at the university. Professor Neil Burgess of the University of Copenhagen shared his thoughts on UN-REDD in Tanzania during a phone conversation prior to our trip. Elias Mashunya of Lawyers Environmental Action Team (LEAT) and Bernard Baha of the Land Rights Research and Resources Institute (LARRI) gave us a useful legal perspective on the issues. From Mr. Manyika, we learnt the viewpoint of the Ministry of Environment under the Vice President's Office of the Government of Tanzania.

Many other people helped us with our research and the planning our trip, and we are sorry we only have limited space and we cannot thank them all. We would like, however, to remember the staff of the *Comitato Europeo per la Formazione e l'Agricoltura* (CEFA) for all their support while we stayed at their hostel in Dar es Salaam. To James Weda, we send our sincerest thanks for driving us safely on often not-so-safe country roads.

We would like to thank the Henry Luce Foundation for their support to the SAIS Environmental Practicum program, which is efficiently run thanks to Andrea Norris, Margel Hight, and Professor Simpson of the International Policy Department at SAIS. To Professor Simpson we are also indebted for his feedback and challenges, which have been a constant motivation to do a better job.



Executive Summary

- The conservation of world forests is an important measure in order to address the ever-worsening consequences of climate change. Not only is forest preservation crucial in terms of biodiversity and carbon storage capacity, but it can also have substantial economic benefits, especially in the long run.
- The prime objective of REDD is to *address a global market failure* that arises from the fact that the social marginal benefit of keeping forests standing is quite often a lot greater than its private marginal benefit. Therefore, forests deliver many positive externalities that are not confined to their direct users; these externalities are not captured by the market system, which typically does not reflect social benefit considerations in the price incentives faced by individuals. REDD would therefore provide local communities in forested areas with financial incentives to perform the globally-valuable function of preserving their forests.
- Tanzania has over 34 million hectares of forests and woodland habitats (more than 30% of the whole country). REDD strategies in Tanzania *should be integrated with, and improve upon, current conservation strategies.*
- The main *sources of deforestation* and *the social effects of successfully addressing them* in Tanzania are elaborated below:
 - The heavy reliance of the population on biomass - charcoal and firewood - for energy purposes means that reducing the availability of biomass for energy would reduce standards of living unless feasible alternatives are provided. Women and children would have to spend more time finding wood-fuel; nutrition and health would also be negatively impacted.
 - Deforestation occurring from agricultural expansion into forested areas is driven by the needs of a growing population. Agricultural practices for subsistence as well as income generation would be affected if REDD is successful; this means that provisions need to be made for increasing land productivity and income generation, lest there be a shortage of food if deforestation is curtailed.
 - The increase in infrastructure required for economic growth and development cannot be abdicated solely for forest conservation purposes. Therefore,

policies should be enacted to ensure that infrastructure development is undertaken in collaboration with conservation efforts and high biomass density regions are prioritized in conservation.

- Timber harvesting, especially for export to China, needs to be promptly addressed; addressing this issue has the least negative social side effects.
- Further, and even more direct, *obstacles to the effective implementation of REDD* in Tanzania are listed below:
- Lack of a clear property rights' regime and high level of land tenure ambiguity. This is an especially acute problem on areas defined as open-access land (about 47% of forest land in Tanzania), as there is no existing direct incentive for the local people for their conservation.
 - Poor governance – corruption and lack of transparency – could allow the siphoning off of REDD funds if not transferred directly to the communities. Further, illegal timber harvesting could be tolerated by corrupt officials, thereby weakening the implementation of REDD policies in Tanzania.
 - Structurally embedded institutional issues such as the unclear delineation of responsibilities, and potential conflicts of interest and divergence in priorities between various government ministries (and at different levels of administration) could lead to a lack of coordination, and inefficient implementation of UN-REDD.
- There are a number of *countermeasures* that can be undertaken in the face of the obstacles to REDD, including within the UN-REDD program:
- Property rights of villages can be extended so as to bring more area of open-access land under the aegis of specific communities.
 - Participatory Forest Management (PFM) efforts should be made more vigorous, and REDD activities should be incorporated into them. There is evidence that forest conservation is more effective in areas under PFM than in areas under government control alone.
 - Distribution of the system of REDD payments should be made open to public scrutiny; this could help reduce corruption at various levels of government.
 - The responsibilities of various relevant government agencies involved with the formulation, implementation, and following through of REDD-related

activities should be clarified so that each agency has a clear and non-conflicting mandate.

- The network of existing non-governmental organizations (NGOs) should be used for the implementation and oversight of REDD related activities in a manner complementary to the government's efforts.
 - Reforms should be initiated in the energy sector to introduce alternative sources of sustainable energy, especially in the cities, that would reduce the demand for charcoal. In rural areas, efficiency in the production and usage of wood-fuel should be improved.
 - In the agricultural sector, land productivity needs to be raised to reduce the pressure of agricultural expansion that is a heavy contributor to deforestation.
- Some globally-applicable issues learned from the Tanzanian case-study are found below:
- *Leakage* will probably occur at the inter-country as well as the intra-country level; effective monitoring practices, and complementary strategies and reforms can help minimize the level of leakage.
 - A national level approach will ensure that REDD payments only reward overall quantifiable reductions of deforestation in each country. However, it may also discourage grassroots participation. Therefore a hybrid approach, combining the *project and national levels*, is recommended.
 - REDD can both be affected by and be an agent of change of *land tenure systems*. Unclear land tenure systems (especially large amounts of open access land) are detrimental to the REDD framework. At the same time, REDD can provide the presently-missing monetary incentives for local communities to bring open-access forests under a regime of commonality and sustainable forest management.
 - Concerns about the equitable nature of the final distribution of REDD resources have been raised. The main question is: how does one ensure that REDD payments are *fairly distributed*, right up to the poorest members of village communities? In this regard, NGOs can play an important role in overseeing the distribution of funds through village level bodies.
 - The potential for the global success of REDD depends to a large extent on whether enough *tangible incentives* are provided by the international

community for forest preservation worldwide. *Concurrent reforms* leading to the diversification of energy supply and increased agricultural productivity will also be an essential component for the success of REDD in the developing world.

List of Abbreviations

BoT	Board of Trustees
CBFM	Community-Based Forest Management
CFM	Collaborative Forest Management
DFOB	Director of the Forestry and Beekeeping Division
EAMCEF	Eastern Arc Mountains Conservation & Endowment Fund
FAO	Food and Agriculture Organization
FBD	Forestry and Beekeeping Division
GPS	Global Positioning System
IPCC	Intergovernmental Panel on Climate Change
JFM	Joint Forest Management
MNRT	Ministry of Natural Resources and Tourism
MOE	Ministry of Energy
MoFEA	Ministry of Finance and Economic Affairs
PERACOD	Programme de Promotion de l'Electrification Rurale et de l'Approvisionnement en Combustible Domestiques
PES	Payments for Environmental Services
PFM	Participatory Forest Management
REDD	Reduction of Emissions from Deforestation and Degradation
SAIS	School of Advanced International Studies
SHP	Small Hydropower (facilities)
SME	Sustainable Modern Energy (services)
TANU	Tanganyika African National Union
TaTEDO	Tanzania Traditional Energy Development and Environmental Organization
TFCG	Tanzania Forest Conservation Group
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

URT	United Republic of Tanzania
WCMC	World Conservation Monitoring Centre
WWF	Worldwide Fund for Nature

I. Forestry and Climate Change

Climate change is increasingly recognized as a major global threat not only by environment and development researchers but also by official defense and international security analysts.¹ The emphasis of most studies is on the worrisome possibility of abrupt and catastrophic climate change occurring in the coming decades. The 1992 UN Framework Convention on Climate Change (UNFCCC) has indicated that the international community should strive to “prevent dangerous anthropogenic interference with the climate system”.² However, there is not much scientific consensus as yet on the specific level of CO₂ concentrations consistent with avoiding “dangerous anthropogenic interference with the climate”.³ Estimates about the threshold of concentrations that should not be crossed in order to avoid catastrophic environmental changes vary from a level of 380 parts per million (ppm) CO₂ – the level of concentrations currently in the atmosphere – up to a level of 550 ppm CO₂ equivalent.⁴ Most analyses concur that the international community should try to limit the global temperature change to a maximum of 2°C with respect to the pre-industrial temperature mean, in order to minimize the likelihood of catastrophic changes in the climate system.⁵ The 2006 Stern Review has argued that at 550 ppm CO₂ equivalent there would be a 77% chance of the associated temperature change exceeding 2°C;⁶ the Intergovernmental Panel on Climate Change (IPCC) holds that a concentration level between 445 and 490 ppm would achieve the 2°C target; the 2008 *Eliasch Review* is in agreement.⁷

Assuming that the mid-range estimates of these studies are a reflection of the more likely scenarios, limiting the global mean temperature change to less than 2°C will be a very

¹ One can find proof of this commingling interest particularly in the United Kingdom. See, for example, *The Eliasch Review* (2008), p.1, and the last *Defence White Paper : Delivering Security in a Changing World* (Ministry of Defence, 2003), p. 5. In the United States, increasing awareness of the security implications of climate change is forming, both in scholarly work and in the government; the Center for American Progress, the Center for Strategic and International Studies, and the Center for a New American Security have all started research programs on the matter. See, for example, John Podesta et al., *The Age of Consequences*, November 2007 (http://www.csis.org/media/csis/pubs/071105_ageofconsequences.pdf)

² *United Nations Framework Convention on Climate Change*, Article II, p. 4. Accessible online at: <http://unfccc.int/resource/docs/convkp/conveng.pdf>

³ Scott Barrett, 2007, *Why Cooperate?* Oxford University Press, p. 88.

⁴ The 2006 *Stern Review* also argues that we currently are at 430ppm CO₂ equivalent, when the warming effect of other gases is taken into account. Barrett also shows that a 550ppm level can be associated with temperature changes ranging from 1.4 °C up to 4.5 °C (*Why Cooperate?*, pp.88-89).

⁵ This is the approach effectively taken by the European Union.

⁶ *Stern Review*, iii.

⁷ IPCC, 2007; *Eliasch* (2008), p. 5; see also Caldera et al. (2003). Limiting the temperature change to less than 2°C, however, is not a guarantee against catastrophic climate change (IPCC, 2007; Barrett, pp. 88-89).

challenging task. In this context, global forests should play a major role in any future agreements on climate change. Forests are a vast, worldwide carbon-sink, whose monetary value has recently been estimated by one source to be approximately \$43 billion for each year that current forested lands are preserved, their “carbon off-setting” service alone being taken into account.⁸ Deforestation, conversely, is a major threat to this carbon-capture potential. Most studies conclude that deforestation accounts for something between 17% and 20% of global CO₂ emissions in the form of released carbon and forgone storage.⁹ Once the emissions likely to derive from the change in land-use are considered, deforestation may account for something between 28% and 32% of global CO₂ emissions.¹⁰ This makes forestry, as defined by the IPCC,¹¹ a larger emitter of CO₂ emissions than the global transport sector.¹² To give another powerful image, the yearly emissions from the forest sector – which produces around 5.8 gigatonnes (Gt) of CO₂ annually – are equivalent to the total annual emissions from the US or China.¹³

The preservation of forest ecosystem services is yet another reason why forests should play a key role in any post-Kyoto international agreement on climate change. The world’s forests are home to about 350 million people,¹⁴ while around 1.6 billion depend on forests for sources of livelihoods such as fuel-wood, medicinal plants, and forest food.¹⁵ Given that increased water demand, damages to crops, soil erosion, and more frequent droughts are all considered to be “likely consequences” of a changing climate in the near future,¹⁶ the tearing down of forests causes multiple harms: a foregone carbon stock; the elimination of the most powerful source of climate change mitigation (as forests regulate regional rainfalls and

⁸ Trivedi *et al.* 2008, *What Are Rainforests Worth?*, ii. Of course it should be noted that any such estimates are somewhat uncertain, and the actual value could be even higher.

⁹ *The Eliasch Review* (2008), xi; E. Madeira, *Policies to Reduce Emissions from Deforestation and Degradation (REDD) in Developing Countries* (December 2008), p. 8; Environmental Defense Fund, *Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) : Implications for the Carbon Market*, p. 3.

¹⁰ See *Development and Climate Change: a Strategic Framework for the World Bank Group* (2008), p. 3, and *The Stern Review* (2006), iv, respectively.

¹¹ “Forestry” is defined as “the science, art, and practice of managing and using for human benefit the natural resources that occur on and in association with forest lands” (IPCC, *Land Use, Land Change and Forestry*). As to the term “forests”, the IPCC uses the broad definition given by the 1970 Encyclopedia Britannica, namely “All lands bearing vegetative associations dominated by trees of any size, exploited or not, capable of producing wood or other forest products, of exerting an influence on climate or on water regime, or providing shelter for livestock or wildlife”.

¹² *The Eliasch Review*, p. 8.

¹³ *The Eliasch Review*, xv.

¹⁴ *The Eliasch Review*, p. 9.

¹⁵ The World Bank (2004).

¹⁶ International Panel on Climate Change, *Climate Change 2007: Mitigation of Climate Change. Summary for Policy Makers*, Summary for Policy-Makers, p. 18.

provide a robust defense against soil erosion); a serious blow to development efforts (as 90% of people living with less than \$1 a day depend on forests for their livelihoods to at least some extent).¹⁷

Present deforestation rates should therefore be a great source of concern for the international community. It has been estimated that 13 million hectares of tropical forests – which are the most precious forests in terms of carbon storage *and* biodiversity – are lost every year; this is equivalent to a forest cover of the size of England being torn down annually.¹⁸ Modeling instruments have calculated that the global monetary cost of the climate change impacts of deforestation will reach about \$1 trillion a year by 2100 if its rate remains unabated.¹⁹

Johan Eliasch and the Office of Climate Change of the UK government suggest that the international community should aim at halving the emissions resulting from deforestation by the year 2020.²⁰ Presently, it is estimated that around 60% of the carbon absorbed by forests is released back into the atmosphere because of deforestation.²¹ As the amount of carbon stocked by forests exceeds the carbon trapped by the oil reserves of the entire world,²² only by tackling deforestation will the world be able to avoid the worst consequences of climate change. Doing so will not come cheap; the Eliasch review estimates that meeting these objectives will cost something between \$17 billion and \$33 billion per year, including opportunity cost and forest protection cost. Nonetheless, there is a strong economic rationale for the preservation of world forests. Many estimates indicate that the cost of preserving forests is low relative to other forms of reducing CO₂ emissions with the technology presently available.²³ Monetary estimates of halving deforestation show that doing so will deliver substantial economic gains over the long-term, in the order of \$3 or \$4 *trillion*.²⁴

These monetary estimates should be met with healthy skepticism. Yet as (i) deforestation accounts for something between 17% and 32% of global CO₂ emissions and (ii) the cost of reducing emissions by limiting deforestation is less than the cost of reducing

¹⁷ *The Eliasch Review* (2008), xv and p. 9.

¹⁸ *The Eliasch Review* (2008), xv.

¹⁹ Modeling has been carried out for *The Eliasch Review*. Refer to *The Eliasch Review* (2008), xvi.

²⁰ *The Eliasch Review* (2008), xii.

²¹ E. Madeira, p. 8.

²² Madeira, p. 8.

²³ Environmental Defense Fund, p. 3, and IPCC 2007, p. 21. Nicholas Stern wrote in his 2006 review that “action to prevent further deforestation would be relatively cheap compared with other forms of mitigation” (p. xiii).

²⁴ *The Eliasch Review* (2008), xvi and p. 78.

emissions in other sectors, there are sufficient reasons to argue in favor of schemes to reduce deforestation and forest degradation worldwide. The program recently launched by the United Nations (UN) in order to tackle deforestation has precisely the objective of reaping the environmental and financial benefits of the preservation of world forests. Its basic tenets will be the subject of the following section.



II. UN-REDD

In the context of current global deforestation rates described by the previous section, the United Nations Framework Convention on Climate Change (UNFCCC), at the 2007 Bali meeting, called for an analysis and demonstration activities of possible mechanisms to Reduce Emissions from Deforestation and forest Degradation (REDD). In response, various mechanisms are emerging to develop and test REDD methodologies. One such is UN-REDD: the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries. Three United Nations agencies – the UN Environment Programme (UNEP), the Food and Agriculture Organization (FAO), and the UN Development Programme (UNDP) – are jointly managing the pilot-phase of UN-REDD.

Pilot projects of UN-REDD will begin in fourteen countries, five of them chosen to be “quick-start” countries, namely the Democratic Republic of the Congo, Indonesia, Papua New Guinea, Tanzania, and Vietnam. These pilot projects will explore ways to effectively manage existing forests in order to: (i) preserve the ecosystem, (ii) maximize the carbon stocks, and (iii) deliver community benefits. This tripartite structure of UN-REDD’s objectives reflects what some studies on REDD mechanisms advocated for. A 2008 Environmental Defense Fund study, for example, underlined the “potential [of REDD] for *multiple benefits* in the areas of climate change mitigation, biodiversity protection, and sustainable development”.²⁵ Similarly, the *Eliasch Review* argued that “any international system that channels finance to reduce deforestation has the potential to *reduce poverty* as well as preserve other eco-system services”.²⁶ Picking up on these ambitious objectives, UNEP Executive Director A. Steiner recently stated that “REDD must benefit *local communities* ... as much as it benefits *national economies* and the *global environment*”.²⁷ Norway has been the most proactive donor country in the initial phase of UN-REDD, contributing US\$35 million for its pilot-projects. J. Stoltenberg, the Norwegian prime minister, has asserted that “fighting greenhouse gas emissions from deforestation is a priority

²⁵ *Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD): Implications for the Carbon Market*, p. 1, emphasis added.

²⁶ *The Eliasch Review*, p. 7, emphasis added.

²⁷ A. Steiner, statement available at <http://www.regjeringen.no/en/dep/smk/Press-Center/Press-releases/2008/un-and-norway-unite-to-combat-climate-ch.html?id=527606> (emphasis added).

for Norway”.²⁸ On March 18th, 2009, the UN-REDD Programme allocated an initial US\$18 million for the implementation of pilot REDD projects in the five quick-start countries.²⁹

The standard definition of REDD is somewhat vague, as it indicates *any action* taken at the national or international level to reduce emissions from deforestation and forest degradation.³⁰ A narrower, albeit still generic, definition, would describe REDD as a system of *financing mechanisms* and *incentives* aimed at mitigating climate change by reducing deforestation and forest degradation.³¹ If there is not a standard, globally-recognized definition for REDD, it is however very clear that the prime objective of initiatives such as UN-REDD is to correct a *global market failure*, to borrow the terminology of public choice and economic theory.³² The market failure arises from the fact that the social marginal benefit of keeping forests standing is quite often a lot greater than its private marginal benefit. Forests, in other words, deliver many positive externalities that are not confined to their direct users; these externalities are not captured by the market system, which typically does not reflect social benefit considerations in the price incentives faced by individuals. Among the societal benefits of forest conservation are benefits such as the carbon-sink function and the regulation of rainfall vital to agriculture. UN-REDD should therefore aim at providing the potential providers of ecosystem services – the individuals living by the forests or the countries whose national territories include forested areas, depending on the level of analysis – with the necessary incentives to perform the socially-valuable function of preserving their forests.

At the same time, UN-REDD should also raise awareness regarding the many sustainable income-generating activities that tropical forests can host, such as nut collection, beekeeping, or medicinal plants’ procession.³³ Some studies have questioned the size and conservation values of these activities as opposed to the total value of the forests (including timber).³⁴ However, the local communities likely to benefit from these sustainable activities

²⁸ J. Stoltenberg, statement available at: <http://www.regjeringen.no/en/dep/smk/Press-Center/Press-releases/2008/un-and-norway-unite-to-combat-climate-ch.html?id=527606> .

²⁹ <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=573&ArticleID=6102&l=en>

³⁰ A. Angelsen and O. Hofstad, *Inputs to the development of a national REDD strategy in Tanzania*, Norwegian University of Life Sciences (UMB) report for the Norwegian Embassy in Tanzania (2008), p.3

³¹ See, for example, Angelsen and Hofstad, p. 3, or *Making REDD Work for the Poor*, p. 5.

³² See Angelsen and Hofstad, p. 11.

³³ See *What Are Rainforests Worth?* (2008), ii.

³⁴ See, for example, Ricardo Godoy et al., whose main message in *Effect of Market Economies on the Well-Being of Indigenous People* (2005), is that “market exposure produces mixed effects on well-being and conservation”. Lelia Croitoru has shown that the value from non-timber forest products amounts to only about

often consist of dispossessed and poor people, who would not necessarily capture the monetary value of timber if the forests were cut down. Local communities are often – in the words of Johan Eliasch – “politically and economically marginalized”, lacking ownership over the land they inhabit;³⁵ preserving the forests via alternative sustainable activities can potentially help reduce their marginalization.³⁶ In order to further reduce the marginalization of local rural communities, REDD projects could also help support sustainable harvesting, a methodology increasingly adopted by conservation organizations to help preserve forests around the globe.³⁷ These activities point to the fact that initiatives such as UN-REDD have the potential not only to reduce global CO₂ emissions but also to deliver local benefits for rural communities, contingent on the availability of sufficient international funds for this purpose.

The global economic rationale for REDD is the same as the one given in favor of the preservation of the world forests in the previous section: reducing deforestation is cheaper than reducing emissions from other sectors (such as the energy, electricity, and transportation sectors), especially due to relatively low deforestation abatement costs in the initial phase.³⁸ In other words, the total cost of halving carbon emissions could be reduced by up to 50% by 2030 if forestry is included in the Copenhagen accords on climate change; conversely, a more ambitious emissions’ reduction target could be attained at the same cost if reduced deforestation enters the agreements.³⁹

A recent study conducted on a sample of 316 World Bank-funded development projects has shown that projects where poverty reduction objectives are linked to conservation efforts score as well as, or even slightly better, than projects solely focused on poverty alleviation.⁴⁰ Further evidence has pointed to the tendency towards an inverse relationship between rural income and deforestation rates, whereby a rise of the former (after

one-fourth of the total economic value of forests, whose estimate includes the market value of timber (Croitoru, *Valuing the non-timber forest products in the Mediterranean Region*, 2007).

³⁵ The Eliasch Review, p. 9.

³⁶ It cannot, however, reduce their need for wood-fuel; as the Tanzanian case shows, resolving rural energy problems is key to any attempt to reduce deforestation.

³⁷ Nature Conservancy has been promoting sustainable harvesting in Bolivia for the past few years, and a recent report shows that the project has caused “no significant loss of biodiversity” (Nature Conservancy, Spring 2009, p. 13).

³⁸ Deforestation abatement costs rise after a certain threshold as they have to cover not only the opportunity-costs of subsistence agriculture and farming, but also the ones of systematic harvesting or plantations (The Eliasch Review, p. 73).

³⁹ *The Eliasch Review*, xii and p. 96.

⁴⁰ Peter Kareiva, in *Science*. Reported by Nature Conservancy, Spring 2009, p. 15.

a certain threshold) is generally correlated with a reduction in the latter.⁴¹ This evidence makes a case for attaching REDD initiatives to as many pre-existing development projects, as well as for the inclusion of poverty alleviation and development measures in future UN-REDD projects.

Given the aforementioned reasons, it is hard to see what the international community has to lose by including REDD measures in a post-Kyoto climate change agreement. It has been shown that the inclusion of REDD in a global cap-and-trade system of carbon emissions will have no significantly negative effect on the price of carbon.⁴² If some pressing problems such as the appropriate level of implementation, leakage, and unclear land tenure systems can be solved, REDD is likely to represent a positive sum game where local communities, different ecosystems, and the global environment all benefit from the efforts geared at reducing deforestation.

The subsequent analysis will show that UN-REDD is likely to face many obstacles in reducing deforestation in Tanzania. At the same time, it will be argued that Tanzanian forests and their local communities are likely to benefit from an efficient implementation of UN-REDD pilot projects and from a future integration of REDD mechanisms in an international carbon market. The final section will then draw some lessons from the Tanzanian case in the hope that these lessons can be useful in the international debate surrounding REDD.

⁴¹ This is the concept of the environmental Kuznets Curve applied to deforestation. There exists – it is purported – an inverted U relationship between deforestation rates and income growth: initially, deforestation increases as income rises; past a certain threshold, however, deforestation rates drop as income continues to grow. See Richard J. Cubas, *Deforestation and the Environmental Kuznets Curve: An International Perspective* (2004). Refer also to Lopez (1994). For a similar viewpoint, refer to the 27th Session of the Subsidiary Body for Scientific and Technological Advice of the U.N. Framework on Climate Change (UNFCCC).

⁴² The Eliasch Review, xiii. The Environmental Defense Fund has recently estimated that – even if all forestry-related credits were included in a global carbon market – the price of carbon would still be “high enough to ensure that critical low-carbon technologies, such as renewable energy sources and carbon capture and sequestration, remain economically viable” (Environmental Defense Fund, 2008, p.2).

III. Case-Study: Tanzania

The United Republic of Tanzania – its national territory encompassing 94.5 million hectares (ha) – contains approximately 34.6 million ha of forests and woodland habitats.⁴³ This feature alone makes the country an appropriate target for conservation efforts. What makes the inclusion of Tanzania in an international REDD mechanism a *necessity* is the rate of deforestation that the country has been experiencing. It has been estimated that Tanzania has lost an average of 412,200 ha of forests per annum in the 1990s and early 2000s; this amounts to a destruction of 14.9% of its forest cover (or 37.4% if we account for woodlands) in the period 1990-2005 alone.⁴⁴

Yet actual deforestation rates are likely to be more worrisome than the ones reported above, for two reasons. First, the Tanzanian Ministry of Energy and Minerals recently estimated that 458,743 ha of forests were cleared in 2002 because of charcoal production alone;⁴⁵ as the following section will show, charcoal production is only one of the drivers of deforestation in Tanzania, albeit the predominant one. Second, if one could account for the forests lost prior to 1984 – year of the first national forests’ inventory⁴⁶ – and for the relatively low standard set by the generally accepted definition of forests (that given by FAO⁴⁷), it is very likely that total forest loss would amount to a greater figure. Moreover, all these figures measure deforestation defined as the “the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 percent threshold.”, i.e. excluding areas where trees are expected to regenerate.⁴⁸ All of the above, points to the fact that deforestation in Tanzania has been occurring on a very large scale, which should be a source of concern for national and international policy-makers.

⁴³ E. Zahabu, *Sinks and Sources* (2008), p. 1, and T. Blomley et al., *Seeing the wood for the trees* (008), p. 380. These studies have used a definition of forest and woodland habitats that includes those areas of land “covered with tress, grass and other vegetation but dominated by trees” (Zahabu, p. 1, ft. 1).

⁴⁴ FRA 2005 cited in <http://rainforests.mongabay.com/deforestation/2000/Tanzania.htm>

⁴⁵ Ministry of Energy and Minerals (MEM), *Baseline Study on Biomass Conservation in Tanzania* (Jan. 2005), p. 21.

⁴⁶ Mwangwone 2005. Linear extrapolation assessments were carried out in 1984 and 1995.

⁴⁷ The Food and Agriculture Organization of the United Nations (FAO) defines forests as “land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.” The FAO definition of forests also includes forest plantations primarily used for forestry or protection purposes, but specifically excludes stands of trees established primarily for agricultural production, e.g. fruit plantations and agroforestry systems.

Global forest resources assessment update 2005: Terms and definitions (Forest Resources Assessment WP 83), Forestry Department, FAO, Rome, 2004

⁴⁸ FAO 2005

Deforestation has been related to demographic trends throughout Tanzania's history; suffice it to point out that the country's population has grown from a mere 12.3 million in 1967 to 34.6 million in 2002, with a 2005 estimate approaching 40 million.⁴⁹ Population trends of Dar es Salaam – Tanzania's largest city – are also indicative of this growth: a city of 396,000 inhabitants until 1972, became a major urban reality, with a population projected to jump to 3 million by 2010. This rise in population makes Dar es Salaam the 9th fastest-expanding city in the world,⁵⁰ and is undoubtedly connected to rates of deforestation. Poverty has also been historically related to deforestation;⁵¹ 50% of Tanzanians live below the poverty line and the country as a whole is 90% dependent on biomass for its energy needs (with only 1% of its rural population having access to electricity in the rural areas).⁵²

If demographics and poverty dynamics have certainly been related to deforestation rates, past forest management frameworks were co-responsible for the trends in forest loss. The history of forest management in Tanzania is strictly related to the country's general history. The country was subjected to German colonial rule from 1890 until 1920, when it became a British colony. The Germans had already noted the importance of conservation, and by 1920 there existed 0.5 million ha of forest reserves in the country. The British continued on this path, by bringing an additional 0.8 million ha of catchment forests under reserved areas.⁵³ During the 1950s particularly, the size of forest reserves multiplied fourteen times.⁵⁴ All these conservation efforts, however, were highly exclusionary of local communities, as they were based mainly upon policing and legal sanctions.⁵⁵ Conservation efforts often reflected the top-down approach of colonial rule. So much so that anti-colonial protests were often associated with anti-conservation protests by Tanzanian peasants; these anti-conservation protests even approached armed conflict following the Second World War.⁵⁶ This widespread resistance to colonially-imposed forest rules was deeply linked to the survival needs of the country's peasants, who needed land to grow crops on and wood for fuel.⁵⁷

⁴⁹ MEM, p. 7.

⁵⁰ http://www.citymayors.com/statistics/urban_growth1.html

⁵¹ MEM, p. 7.

⁵² MEM, p. 3 and 7.

⁵³ Zahabu, p. 1

⁵⁴ T. Sunseri, *Every African A Nationalist* (2007), p. 888.

⁵⁵ See Blomley et al., p. 380.

⁵⁶ Sunseri, p. 885.

⁵⁷ Sunseri, p. 889.

When Tanzania gained independence in 1961 under the leadership of Julius Nyerere and his TANU (Tanganyika African National Union) movement, fractions of the population felt that forest reserves would now be available for the taking, leading to a rising number of encroachments in the 1960s.⁵⁸ After Nyerere made it clear that forest boundaries had to be respected, Tanzania experienced – for much of the 1960s – a pattern of peasants’ resistance to forests’ reservation similar to the one the British had experienced before.⁵⁹

It is very clear that all these past conservation efforts (based on the notion that conservation necessitated an increase in the amount of forests under state tenure) ultimately failed because they were exclusionary of Tanzanian local communities.⁶⁰ Starting in the 1980s, local communities have increasingly been involved in managing the country’s forests. The policy reforms of 1998, coupled by the law reforms of 2002, established a very advanced participatory forest management framework with the objectives of (i) improving forest quality, (ii) improving forest governance, and (iii) improving livelihoods.⁶¹ It is appropriate to briefly analyze both Tanzania’s current land tenure systems and its participatory forest management schemes.

Presently, there exist three land categories in Tanzania: reserve land, general land, and village land. Effectively, however, village land is very hard to distinguish from general land⁶², as villages extend to the most remote areas of the country.⁶³ Only the two categories of reserve land and general land (village land is therefore subsumed within this category) are explicitly referred to below. Quantitatively, reserve land consists of 16 million ha of reserved forests and 2 million ha of national parks (the total amounts to about 54% of all forested land); the remaining 16 million ha (equivalent to 46% of all forested land) are unprotected forests under general (*de facto* open-access) land.⁶⁴

Within this land-tenure system, Participatory Forest Management (PFM) has become an established reality in the country. There are two forms of PFM. One is Community-Based Forest Management (CBFM), which concerns forests situated on village or general land.

⁵⁸ Sunseri, p. 911.

⁵⁹ Sunseri, p. 912.

⁶⁰ Wiersum (2004) and Kiss (2004), quoted by Zahabu, p. 2.

⁶¹ Blomley et al., p. 381. Zahabu, p.2.

⁶² ‘general land’ is defined in the Land Act of 1999 as “all public land which is not reserved land or village land and includes unoccupied or unused village land”. Nevertheless, the concept of ‘general land’ in Tanzania is very complicated due to the ambiguity of the legal definition and much dispute about the *de facto* existence of such “general land” and both *de jure* and *de facto* ownership of it.

⁶³ Many scholars and researchers told us during interviews that everywhere you go in Tanzania, you will find somebody claiming ownership over that piece of land.

⁶⁴ Zahabu, p. 1.

Local communities can gain lawful ownership over portions of general land and submit a management plan to the District Council. In CBFM practices the local communities carry the entire costs and benefits of forest management. The alternative form of PFM is called Joint Forest Management (JFM), which takes place on reserve land: villagers can enter into management agreements with the central or local governments to share responsibilities over the reserved forest.⁶⁵

PFM is undoubtedly an established reality in Tanzania, but it is still a limited one. Only about 11.6% of reserve land and 10.2% of general land are currently under participatory management practices.⁶⁶ This means that, although villagers and local communities have acquired a progressively more important role in the management of the country's forests, a variety of other actors are important participants in the management of the country's forests.

The central government has extensive powers over the country's forests. All land constitutionally belongs to the State, and the President holds the land in trust for the people.⁶⁷ The President is advised by a Land Commissioner, who holds an executive position and is appointed by the President. Within the Ministry of Tourism and National Resources, the Forestry and Beekeeping Division (FBD) is in charge of managing the country's forests. Finally, the Environment Division of the Vice President's Office is in charge of negotiating all international agreements regarding the environment, UN-REDD included.

Local governments are also involved in the management of the country's forests, as the District Councils are often in charge of supervising reserve land, and have to approve PFM agreements with by-laws. At the village level, the Village Council and the Village Natural Resources Council are the main reference institutions for any participatory forest management plans.

A variety of civil society groups also have a role to play in the management of Tanzania's forests. National and international NGOs – such as the Tanzania Forest Conservation Group (TFCG), the Eastern Arc Mountains Conservation Endowment Fund (EAMCEF), CARE International, Agenda, WWF Tanzania – continuously contribute efforts and resources to participatory forest management practices. Academia represents an important source of advice and discussion on forest management practices, as both the *University of Dar es Salaam* and Morogoro's *Sokoine University* host several scholars who

⁶⁵ *The Arc Journal*, Issue 21.

⁶⁶ *The Arc Journal*, Issue 21.

⁶⁷ F. Derby, *Improving and Facilitating Land Title Registration Processes in Tanzania* (2002), p. 1.

have studied the subject in great depth. Tanzania's lawyers organizations have also contributed ideas to the implementation of PFM, and represent a lively voice in Tanzanian society. Finally, the private sector inevitably has stakes and responsibilities in the management of forests and natural resources.⁶⁸

Any international program such as UN-REDD will have to take into account *both* pre-existing PFM practices *and* this diverse spectrum of forest management actors if it is to successfully contribute to the sustainable management of the country's forests.



⁶⁸ In both a positive and a negative sense. Coca-Cola has recently agreed to co-operating in the sustainable management of the area of the Ruvu river near Dar es Salaam. Some mineral extraction companies, on the other hand, have a bad press in the country, due to their exploitative practices.

IV. Drivers of Deforestation

Any system aimed at reducing deforestation, should of course address the causes of deforestation. Furthermore, if there is effective reduction in rates of deforestation, it will have further ramifications on the social and economic sphere. This section will discuss the main causes of deforestation in Tanzania and the effects of reducing deforestation on livelihoods, standards of living, agricultural output, and development of the affected population.

Biomass Consumption: Charcoal & Firewood

Tanzania relies on biomass as the source for 91% of its energy supply.⁶⁹ Arguably, the biggest driver of deforestation in Tanzania is the harvesting of wood for fuel and charcoal production.⁷⁰ Populations in rural areas rely heavily on firewood for their energy (primarily for cooking), while urban populations use charcoal. Although rural households account for 75% of the population, urban households use relatively much more biomass, as they account for about 40% of total wood-fuel consumption.⁷¹ Therefore, in forests surrounding village areas, deforestation occurs due to the demand for fire-wood. Due to a high demand for charcoal in the cities (Dar es Salaam accounts for 50% of national charcoal consumption),⁷² its production causes widespread deforestation, in particular in areas surrounding the cities. Its market price remains competitive relative to other energy sources, even when it needs to be transported from regions far from the cities. Small quantities of charcoal are produced locally by individuals in forests surrounding their villages and sold on the roadsides, but commercial quantities of charcoal are usually produced by non-local individuals or groups, who often move around the country, and transport the charcoal to the cities. As urban centers expand, so does the demand for energy, and thus for charcoal, as it remains the most viable and economically competitive source of energy for cooking purposes.

If one assumes that REDD policies (or any other framework) succeed in reducing deforestation, an immediate consequence will be the reduction of biomass available for energy generation. Given that biomass is steadily becoming a scarce resource due to

⁶⁹ MEM, p. 3.

⁷⁰ In 2002 alone, charcoal production accounted for about 450,000 hectares of deforestation; this is out of a total national annual average deforestation rate of approximately 500,000 hectares. (MEM, p. 21). This trend was stressed by Charles Meshack, executive director of Tanzania Forest Conservation Group in January 2009.

⁷¹ MEM, p. 8

⁷² This information was gained in an interview with Christian Peter, Senior Natural Resource Specialist for East Africa, World Bank, Tanzania.

demographic expansion – per capita consumption has declined in the last 40 years, notwithstanding an overall increase in the amount of biomass consumed – further reducing its availability could substantially impact living standards in a negative manner. If utilisable biomass is further reduced through REDD policies, without simultaneously providing alternative sources of energy and income, there could be a number of negative social effects. In many areas, women and children already spend several hours a day fetching fire-wood, thus taking away from children the opportunity to attend school, and from these women the ability to engage in direct income generating activities. Furthermore, scarcity of fire-wood forces some households to cook fewer meals per day, as well as to change their diets, thus having a detrimental impact on their health and nutrition. Also, in cold areas where fire-wood is used for heating, its dearth can create health problems for children and elderly people.⁷³ Finally, charcoal production is one of the main sources of income for many rural communities. If REDD further adds to the scarcity of utilisable biomass (both for satisfying energy needs and generating income), then these social problems will be exacerbated to a large extent and accompanied by a potential fall in income, unless relevant countermeasures are taken.



⁷³ MEM, p. 22.

Agricultural Expansion

Agriculture is the main economic activity in Tanzania: it accounts for 50% of the country's Gross Domestic Product (GDP), and employs over 90% of the work force.⁷⁴ After biomass consumption for energy, the next important driver of deforestation is agricultural expansion and encroachment. This occurs primarily in the form of *subsistence shifting cultivation*. A lack of technology and inputs (such as fertilizer, electricity for irrigation purposes, seeds, etc.) leads to a stagnation of agricultural yield. Low agricultural fertility of the land in many of the forest areas leads to diminishing yields. The above-mentioned circumstances, in addition to a growing demand for agricultural crops (for food or industry) from a growing population, lead to the continuous expansion of agricultural land at the expense of forests.⁷⁵ This expansion is partly government-led and partly spontaneous. When agricultural expansion is spontaneous, it is often accompanied by the utilization of the harvested trees to produce charcoal.⁷⁶

If REDD limits the amount of land that can be cleared and used for agricultural purposes, it will also limit the amount of food and agricultural produce available for subsistence purposes, as well as a source of income. Therefore, corresponding strategies to increase food yield should be introduced; this is further addressed later in this paper on the section on countermeasures.

Infrastructure Expansion

For any country, and especially for developing countries, increasing the level of infrastructure is an essential component for economic growth and development. Tanzania's national road network is underdeveloped, with many areas of the country lacking connectivity. This has a large negative effect on rural areas as access to markets is severely limited, thereby dampening commercial opportunities.

Almost any increase in roads and similar infrastructure will lead to deforestation and/or degradation. Firstly, forested land is cleared in order to build new roads. Secondly, the expansion of the road network makes the "exploitation of natural resources and sale of

⁷⁴ MEM, p. 4.

⁷⁵ The contribution of agricultural expansion to exacerbating deforestation was highlighted to the team by many analysts on the ground in Tanzania, including C. Meshack, and AGENDA staff.

⁷⁶ E. Zahabu, p. 59.

agricultural crops...less expensive”, thus encouraging further deforestation through this two pronged mechanism.⁷⁷

REDD policies should take into account the unquestionable need of developing countries to increase their infrastructure. Therefore, infrastructure expansion and anti-deforestation measures should be combined in a synergistic framework involving land-planning and inter-sectoral coordination. A blanket stop on deforestation will have large negative ramifications for development (and it is hard to see how the government would agree to this). Therefore, REDD money should be used in such a way as to provide incentives for the conservation of relatively high biomass density areas (for example, those with more than 50 trees per hectare), as well as supporting the retention of those forests where other ecosystem services add value beyond the conservation of carbon stocks.⁷⁸

Timber Production

As the timber industry is rife with corruption and illegal practices, reliable figures as to its contribution to deforestation are not readily available. Figures that do exist are widely considered as an underestimation of the actual harvested volumes.⁷⁹ To solve the problem of very high deforestation due to a demand for timber in foreign countries, the government imposed a ban on the export of timber in 2004. However, the ban has been highly ineffective and harvesting of forests for timber exports, primarily to China, has continued largely unabated.⁸⁰ Although reliable figures are not available, suffice it to say that timber harvesting is still an important cause of deforestation in Tanzania.

In this case, it is hard to see what direct negative social impact would occur by reducing the amount of unsustainable, illegal, export-driven, timber harvesting, besides the obvious reduction of income to commercial timber companies and the workers employed by them.

⁷⁷ Angelsen and Hofstad, p. 26.

⁷⁸ Angelsen and Hofstad, p. 26

⁷⁹ Angelsen and Hofstad, p. 26

⁸⁰ This information was gained through discussions with C. Peter. The team also witnessed illegal harvesting occurring in person. It has been estimated that “China accounted for all indigenous hardwood log exports and three-quarters of sawn wood and raw material” (http://www.illegal-logging.info/sub_approach.php?subApproach_id=71).

V. Obstacles to Effective Implementation of UN-REDD

UN-REDD is an ambitious program aimed at attaining worthy goals. Like any project of this nature, a number of obstacles could arise, negatively impacting the functioning and efforts associated with the undertaking. This section will seek to highlight these potential hurdles. Developing countries often broadly share certain political, financial, legal, and social characteristics; therefore, while this section looks at Tanzania primarily, similar conditions are likely to present themselves in a number of other countries where REDD may be implemented.

Poor Governance – Corruption and Lack of Transparency

Corruption, in various forms, is often touted as endemic and harmful to effective governance in many countries. This rings true for Tanzania, and it has the potential to harm the effective implementation of REDD. As illustrated in a recent *TRAFFIC* report, corruption takes the following forms in Tanzania: bribery, favoritism, and nepotism.⁸¹

Favoritism and cronyism, whereby contracts and permission for logging (and similar activities that contribute to deforestation and degradation) are given by government officials to people of their choice, irrespective of the merits and/or legality of the situation, are prevalent at various levels of government, including but not limited to the central government, and among people in relatively senior positions. The practice of issuing official documentation for the illegal harvesting of logs is a major challenge (this practice of fraudulent documentation is commonly known as “rubber-stamping”). The fact that the *TRAFFIC* report – a Tanzanian Government sponsored publication – has written that “the *presence of a direct interest in the timber trade by individuals within the Executive and line Ministry arguably presents the greatest concern* with respect to ensuring integrity in decision-making, fairness, impartiality, transparency and justice,” clearly shows the extent of the problem

⁸¹ Milledge, Gelvas, and Ahrends, *Forestry, Governance, and National Development*, TRAFFIC (2007), pp. 11-12.

(though this official acknowledgement should also give one hope that there are people in government looking to tackle the problem).⁸²

Besides high-level cronyism, chronic petty corruption is also prevalent in Tanzania. This form of corruption plays a role at the lower levels, primarily the district level. As revenue from forests is not retained at the district level to the satisfaction of the administrators there, they often resort to accepting bribes, and turn a blind eye to illegal practices.⁸³ This is seen by some of them as the only option, and a 'fair' one, given the perceived lackadaisical attitude of the central ministry. The effect of such practices in concrete terms is that in 2004, 96% of the actual timber harvested in Tanzania was not officially reported, i.e. it had at least one component of illegality attached to it. The result was that revenue was collected by the government on only 4% of the actual harvest, leading to an estimated national loss of US\$58 million in 2003-2004.⁸⁴

Corruption related issues may hamper UN-REDD in two direct ways. If effective mechanisms for channeling REDD funds are not put into place, then they may never reach the Village Councils and households where they are needed. A potentially bigger problem might be that the people within the government structure benefiting from activities such as illegal logging would continue their activities as they would not personally benefit from REDD funds. Because of these corrupt practices, illegal logging and timber harvesting could continue even within the UN-REDD framework; overall performance could thus be hampered. In the long run this could mean that REDD efforts would not be sustained by the various actors, as they would not receive their due benefit from their conservation activities due to the presence of these various spoilers.

The positive side of the picture in Tanzania is that there is considerable high-level political will to tackle the corruption issue. An anti-corruption bill was passed in 1997, and according to the World Bank, although there is much room for improvement, considerable progress has been made in reducing corruption.⁸⁵ In this

⁸² TRAFFIC, pp. 11.

⁸³ Interview with experienced official in the country.

⁸⁴ TRAFFIC, pp. 11.

⁸⁵ *Putting Tanzania's Hidden Economy to Work* (February 2009), p. 26.

respect, poor accounting systems and large revenue leakages provide opportunities for corruption.⁸⁶

Institutional-Structural Issues

At the institutional-governmental level there is definite potential for a lack of coordination, and a clash of interests, interfering with the optimal performance of the UN-REDD directed effort. This can occur in two main ways: (i) horizontally, between different ministries of the government and (ii) vertically, between different levels of government (central – district levels).

Various government ministries have their own mandates, priorities, and goals. Money that is meant for forest conservation, distributed through government channels, could be captured by the finance ministry and used for general budgetary support instead of its originally intended use.⁸⁷ Proposals by government departments such as the Ministry and Natural Resources and Tourism, directly involved with forest conservation (and by implication REDD implementation), are sometimes ignored by other ministries (such as the Finance Ministry). Even within government branches directly involved with the creation of a national REDD strategy, there exists some ambiguity in regard to overlapping responsibilities. In some instances, the FBD of the Ministry of Natural Resources and Tourism and the Ministry of Environment under the Vice President's Office have not been completely effective in coordinating their efforts.⁸⁸ These dynamics play a detrimental role for conservation efforts, and occur primarily due to a divergence in priorities. Furthermore, many other examples of potential intersectoral clashes abound:

Agriculture policies may be designed to increase cropland area in view of increasing food prices in the world market. New road construction projects may be started in vulnerable forest areas in order to enhance rural development. Electricity prices may be raised considerably as a consequence of increasing oil prices, leading to increased consumption of charcoal. This illuminates the need for broad co-ordination between sectors for the country to be able to capture

⁸⁶ *Putting Tanzania's Hidden Economy to Work*, p. 26

⁸⁷ Angelson-Hofstad report, pp. 19.

⁸⁸ Interview with anonymous UN official.

potential revenues from REDD. If various sector policies are not co-ordinated, much effort may be spent by the two main ministries without significant result.⁸⁹

The vertical form of institutional problems arises due to a lack of coordination between the policies of the central government, with its ministries based in the capital area, and the various district level councils. The existence of a weak administrative structure, wherein there is a lack of clear authority and unclear demarcation of responsibility between these levels of governance, drastically contributes to inefficiencies in the sector. To make this clearer: under the existing administrative system at the local level, district forest staff report to the District Executive Directors (which are at the local devolved level), while issues associated with accountability and transparency are generally referred back to the Director of the Forestry and Beekeeping Division (DFOB) at the central level.⁹⁰ According to a World Bank report, the effects of this institutional arrangement are that

the conflicts that arise under such an arrangement have resulted in ongoing discussions among DFOB and the local government authorities, with assistance from the President's Office. Ad hoc working groups attempt to resolve the issues but the outcomes of such efforts often appear as arbitrary decisions. The multiple levels of responsibility have also resulted in lapses in accounting. Forest assets are not included in the national accounts and no reliable national database of forest inventory exists.⁹¹

Another factor adding to the institutional inefficiencies is that 80% of the revenue collected by district level representatives is supposed to be sent to the center, thus creating a disincentive for some district level officials to cooperate with the center. The district level officials could resort to corrupt practices or just neglect to

⁸⁹ Angelson-Hofstad report, pp. 19.

⁹⁰ *Putting Tanzania's Hidden Economy to Work*, pp. 26-28.

⁹¹ *Putting Tanzania's Hidden Economy to Work*, pp. 26-28.

carry out their duties of properly overseeing the forests in an effective manner.⁹² Either of these actions would have a negative effect on the workings of REDD.

A final governance-related issue that could hamper REDD efforts is the lack of organizational capacity to oversee its implementation.⁹³ There is no formal well-developed mechanism through which the various stake-holders, from the supply as well as the demand side (i.e. the forest owners/managers and the foreign buyers of carbon credits, such as companies), can systematically engage with each other; this is accompanied by considerable inefficiencies such as inexperience of personnel, small scale *ad hoc* interactions, and a lack of comprehensive training in the relevant regulations and mechanisms of the transactions. Considerable efforts need to be made to train people at various levels, including the village, district, and central government level in various aspects related to carbon emissions initiatives.

Land Tenure Ambiguity and Lack of Clarity in Property Rights

For UN-REDD to succeed, it is imperative that the funds for forest carbon conservation are transferred to the right people. These would primarily include the users and owners of land. It must be clarified who the owner of a piece of land is, but further, the rights and privileges that accompany the title of ownership should be enforceable and upheld in the legal system. Of the total area of 34 million hectares of forested land in Tanzania, about 47% is classified as general unprotected land (open-access), while most of the rest of it is either reserve land or national park, thus putting it under the direct control of the central government.⁹⁴ For every type of land tenure system, an appropriate method to channel and distribute funds must be developed.

The process of identifying key agents and then distributing the funds to them is a step which could potentially face certain problems. For the land owned by the central government, funds could be distributed to the government itself, but specific measures should be in place and agreed upon by the various ministries as to the allocation of these funds. For example, if REDD funds are siphoned off by the Finance ministry for non forest-conservation related uses, it may lead to a situation

⁹² Interview with senior specialist in the country.

⁹³ *Putting Tanzania's Hidden Economy to Work*, p. 28.

⁹⁴ Zahabu, p. 1.

where UN-REDD requirements are not fully met. Similarly, Joint Forest Management should be further explored by the government as a means to ensure that monitoring, surveillance, and implementation of forest related policies are optimally executed. For example: the Finance Ministry has not yet approved a proposal by the FBD to share 40% of the revenue generated through JFM practices with the local communities involved in the management efforts.

Another category of land is village-owned land; it is relatively easier to implement REDD policies in this area (at least when village land is distinguishable from general land), as the beneficiaries can be clearly identified. The Village Council or the Natural Resources Committee of the village can be given the REDD funds to further distribute and spend in the most appropriate manner. However, the point has been raised that REDD funds would ideally be distributed to individual households and not to the village council, as only a micro approach to distribution of funds will ensure effective conservation of forests by incentivizing every potential villager to refrain from cutting forests in an inappropriate manner. While this micro-distribution of funds may theoretically be the most ideal, the overwhelming amounts of data, and the institutional arrangements required for its implementation would likely be so overwhelming as to make it impractical.

The more problematic category of land tenure however, is that which is classified as General Land (also known as no man's land). This land is open for use to everyone, and is consequently the area that suffers the most from deforestation and degradation.⁹⁵ As 47% of the forest land falls into this category, a solution needs to be found whereby management, conservation, ownership, or oversight of this land can be given to an agent. This would be necessary to prevent leakage of deforestation activities from one area to another, and more generally, to ensure that REDD policies are actually effective. The option sometimes suggested is to bring this land under the auspices of the government. This however, would be generally impractical as the government is already looking to de-gazette some of its currently protected forest

⁹⁵ This is found in the Angelson-Hofstad report, but was repeated to the research group many times by various forestry experts in Tanzania. See also Zahabu, p. 4.

reserves, and would probably be unwilling to increase the amount it classifies as reserve land.⁹⁶

The other option would be to transfer this land under the aegis of villages. This would be advisable, as there is evidence that participatory forest management has been more effective in preserving forested lands than government authority alone.⁹⁷ The amount of land managed or owned by villages could be expanded to include larger amounts of general land in its vicinity. Members of the Natural Resources or Forest Committee of the villages can then be engaged in oversight and surveillance of this land to ensure that the conservation efforts succeed. If ownership or management of land is formally transferred to villagers, then measures such as Joint Forest Management and Community Based Forest Management will have a higher chance of success due to the greater financial incentive available through the existence of REDD funds. As highlighted earlier in this section, for the optimal functioning of JFM, a clear mechanism for the distribution of funds to villagers should be agreed upon by the government.

⁹⁶ This information was given to us in a series of meetings held at the Forestry and Beekeeping Department of the Ministry of Natural Resources and Tourism held in January 2009.

⁹⁷ Blomley et al., p. 389.

VI. Countermeasures: approaches to reducing deforestation

This section focuses on some of the steps that Tanzania could take to facilitate the successful implementation of UN-REDD. The countermeasures proposed below are directed towards the drivers and obstacles elaborated upon in the preceding sections. It should be noted that the objective of this section is not to dictate policy recommendations to any of the agents involved, but simply to highlight some of the potential initiatives that could be considered for a national REDD strategy.

Participatory Forest Management in Tanzania

Participatory Forest Management (PFM)⁹⁸ in Tanzania has three main policy goals:

- Promotion of sustainable forest management activities for the enhancement of forest quality and for the retention of forest resources for future community needs.
- Improvement of livelihoods through the establishment of a system whose aim is to guarantee higher revenues from forests and sustain the supply of forest products for subsistence purposes.
- Improvement of the forest governance system at the village and district levels through the design of a transparent and accountable institutional framework.⁹⁹

In the last 15 years, the implementation of participatory forest management has seen an expansion from a few pilot projects to its implementation in 53 districts on mainland Tanzania.¹⁰⁰ The country has made great efforts in creating a progressive forest management regime that has become a central feature of forest governance.¹⁰¹ Local communities, either working autonomously or with the direct participation of government authorities, are managing forest resources for sustainable use and for conservation purposes. The successful implementation of participatory forest management is the consequence of a parallel development of pilot projects carried out with civil society organizations, together with the creation of a framework of forest policies. Legal arrangements and sweeping reforms of the political and economic spheres have created a legal environment conducive to the

⁹⁸ Also referred to as Collaborative Forest Management (CFM), (Zahabu 2008)

⁹⁹ Blomley et al. (2008); URT 2003; Zahabu 2008

¹⁰⁰ Blomley et al. (2008). Participatory Forest Management in Tanzania was established in 53 out of 126 districts, i.e. in over 18% of total villages on mainland Tanzania, that is > 3.6 million ha of land covered by forests, 11% of the total (Blomley et al. 2008).

¹⁰¹ PEP Report 2008

implementation of participatory forest management. The patchwork of policies, laws and practices for forest management created in mainland Tanzania is considered to be one of the most advanced on the continent.¹⁰²

About 46% of forest-covered land is general land, falling under the open-access category. For conservation purposes, it is desirable that PFM be expanded towards this category. The portion of forest land categorized as “no-man’s land” hinders most of the efforts of conservation policies.¹⁰³ The experience of the SAIS team in Tanzania – together with the analysis of the main studies on forest management – also suggests that participatory forest management should be extended to the general land by re-categorizing open access land as village land. Extending more responsibilities to village communities would encourage them to claim open access land under their oversight and implement Community-Based Forest Management (CBFM) on it, which, at the moment, seems to be the most effective land tenure arrangement for conservation purposes in Tanzania.

Joint Forest Management (JFM) also has good potential for forest conservation purposes. However, its implementation is hindered by organizational and institutional arrangements that obstruct the optimal flow of payments to the communities directly involved in the provision of environmental services. According to the agreements stipulated in the *Forest Land Act* of 2002, under JFM, national or local governments and national forests reserves’ dwellers (villagers) share responsibilities in the portion of forest they jointly manage. According to the Forestry and Beekeeping Division (FBD), the revenues from the JFM should be partitioned in the proportion of 60% to the government and 40% to the communities.¹⁰⁴ The Ministry of Finance and Economic Affairs (MoFEA), however, controls these funds and is still reluctant to distribute this 40% share to local communities. Hence, even though forest dwellers are actively working on the conservation of the forests, they are still excluded from revenue-sharing; they are, effectively, preserving and patrolling forests voluntarily. The FBD strongly advocates for the distribution of revenues to the communities in order to provide the necessary economic incentives to increase the local legitimacy of JFM, thus contributing to its long-term feasibility.¹⁰⁵

However, being constrained by budgetary limits, MoFEA is hesitant to decisively commit to the system of payments for environmental services (PES) proposed by the FBD.

¹⁰² Blomley et al. 2008

¹⁰³ Zahabu, E. 2008, “most deforestation takes place in general land” (pp. 1-4), PhD dissertation

¹⁰⁴ Interview with FBD staff, Dar es Salaam, January 6th, 2009.

¹⁰⁵ This emerged as a primary concern during one of our meetings with the FBD staff.

According to many FBD officials, the main reason is that the MoFEA is concerned about creating a precedent with other ministries or sectors by channeling funds to local communities via FBD. For instance, other influential ministries, such as wildlife preservation, could use the initiation of JFM payments as a justification for requesting more funds and putting increased pressure on the national budget.¹⁰⁶ Another reason is that the institutional reform process in Tanzania should take into consideration the political trend of the past few decades. The ongoing administrative decentralization process is a potentially positive development in Tanzania because it could facilitate the interaction among stakeholders at different levels. Yet the socialist tradition and the imperial legacy of state centralization still make it difficult for decision-makers to accept proposals such as decentralized PFM and REDD payments.

The condition for the successful community-based management of a common-pool resource like forests is that the benefits to the community outweigh the costs.¹⁰⁷ The communities that have full responsibility over CBFM practices face incentives that are considerably higher than those originating from JFM where payments are currently non-existent. However, the data gathered by Blomley et al. suggest that, in the long run, joint forest management could be more effective than community-based management.¹⁰⁸ This is because it would involve both the national government and the local communities by promoting close cooperation between the parties, which would translate into an improved monitoring system. Meshack concludes that for JFM to work, it is necessary that forest conservation efforts be directly linked to alternative income-generating activities. By coupling economic activities with local forest management, JFM should create a system where the economic benefits from illegal activities are less than the payments obtained through conservation efforts.¹⁰⁹

Overall, participatory forest management is the stepping-stone upon which UN-REDD could build a strong structure. If properly integrated into the PFM structure, REDD could add significant value to the system of payments by providing the necessary – and presently missing – incentives for forest conservation. The rationale for the implementation

¹⁰⁶ The issue emerged during one of the interviews carried out with government officials in Dar es Salaam. Our impression is that this institutional impediment and lack of coordination may hinder the full implementation of the JFM program. This would make it more difficult for donors to trust the Tanzanian government to effectively channel UN-REDD payments to local communities..

¹⁰⁷ Ostrom, E., 1999

¹⁰⁸ Blomley et al. 2008

¹⁰⁹ Meshack (2007)

of participatory forest management – referred to as *Mkukuta* – is to create, in all districts, mechanisms for improving the livelihoods of communities from natural resource management.

However, equity within forest communities seems to be another obstacle for a viable PFM-REDD system because the benefits are unlikely to be equitably-distributed among community members.¹¹⁰ The administrative procedures set up by participatory forest management can lead to a capture of payments by the village elites that exclude the poorest members of the community. It is then necessary to design policies that in the long run would guarantee an equitable share of revenues among the stakeholders. A UN-REDD monitoring structure – which would require the support of NGOs – could serve as a facilitator and improve the accountability and the transparency of intra-community revenue sharing. One of the challenges for UN-REDD is to bridge the gap between these bureaucratic arrangements, thus solving the problem of unequal distribution of benefits.¹¹¹

Regulatory Framework and Enforcement Measures

Assuming that a system of payments for forest conservation is established, possibly with the contribution of UN-REDD funds, policies should seek to create a set of regulatory and enforcement measures with the following objectives:

- *Clarifying and enforcing property rights* in the legal system and on the ground (i.e. *de jure* and *de facto*). This by itself is, of course, not enough to guarantee the effectiveness of conservation measures, as it should be complemented with the appropriate incentive structure. Promoting a precise land-planning scheme and assigning property rights, together with a progressive integration of PFM and REDD, are nonetheless the *necessary conditions* to achieve wider conservation goals.
- *Improving governance*, i.e. eliminating corruption, improving transparency, increasing accountability. Efforts have already been initiated in this direction thanks to considerable political will.

¹¹⁰ Here it is necessary to emphasize that the problem doesn't only occur between MoFEA and communities. The equity issue arises also within communities.

¹¹¹ Making REDD work for the poor

- *Strengthening enforcement*, i.e. controlling illegal activities, improving monitoring and compliance. The on-going involvement of local communities in these efforts should be continued.

On government-owned reserve land, stricter control should be exercised, enforcing prohibitions on harvesting or other harmful interference with the natural environment. The government should enhance its technological and human capital together with its funding capacity for forest monitoring and management. However, since for the time being, as well as for the foreseeable future, the government lacks the funds and the capacity for sufficient monitoring and enforcement, local communities bordering these forests should be involved in the protection of reserves. UN-REDD could play a central role by filling the financial gap, which constrains conservation activities and institutional reforms performed by the government.

JFM projects should be continued and developed in forest reserves where harvesting of some forest products is tolerated. Under this arrangement, local communities help the government police the forests in return for sustainable user rights – access to some forest products and services – and a certain portion of the return from these forests. Thus, local communities would receive income from protecting the forests. Unfortunately, implementation of these projects is currently held up by the reluctance of the Finance Ministry to share its income from these reserves with local communities.

By using the PFM structure as its foundations, the UN-REDD policy framework would involve limiting access to the general land to specific stakeholders. In fact, as repeatedly mentioned in this report, severe deforestation occurs where access to forests is free and not monitored. The expansion of CBFM to open access lands should thus go hand-in-hand with further clarification of property rights and well-structured enforcement and monitoring systems. The communities in charge of forest management under CBFM are already carrying out patrolling and monitoring functions with the assistance of several national and international NGOs. The purposes of these functions, however, should be expanded further through the activities of these NGOs with activities aimed at spreading awareness and capacity building.

The improved capacity to carry out monitoring activities depends upon the development and adoption of technological solutions for more accurate measurements: one example is the adoption of a satellite monitoring system. This technological solution is not

very expensive if freely available imagery is used, but it still needs the contribution of on-site monitoring, which can be carried out mostly by villagers who are trained in the field by NGOs to reduce transaction costs of measuring carbon.¹¹² This monitoring system is characterized by two important features: (i) it is user friendly, i.e. it utilizes hand-held GPS devices that are easy to use; (ii) the data are presented in a format acceptable to the scientific community.¹¹³

Monitoring activities carried out on site consist of a number of measurements that allow one to assess whether, and to what extent, deforestation is being reduced. Monitoring actual deforestation and forest degradation is a difficult task, but with some organizational and institutional improvements these difficulties can be reduced over time. It is, however, imperative to reach an agreement on reference baselines of deforestation rates and methodologies for estimating trends of deforestation. A reliable monitoring system is the crucial condition for the creation of a credible enforcement system and helps eliminate scarce monitoring capability, leakage and bureaucratic loopholes, which are the main reasons why the recent ban on exports of timber is presently not very effective.¹¹⁴

Institutional organization

A REDD system based on the foundations of PFM requires strong institutional support. Since the monetary benefits of the system are potentially higher than those provided by PFM, the institutional structure would need stronger institutions with a well-established system of checks and balances to improve accountability, transparency, governance and equal participation of the stakeholders.¹¹⁵ The institutional structure should be based on three basic principles:

- The clarification of the stakeholders' roles as well as improved communication among them.
- The promotion of transparency and accountability through a system of information dissemination that would enhance public scrutiny.

¹¹² Zahabu, E., 2008

¹¹³ *Ibid.*

¹¹⁴ The information has been gained during several interviews on the ground.

¹¹⁵ Angelsen and Hofstad, 2008

- The integration of REDD in national policy and legislation. This entails the examination of shortcomings in the PFM implementation and the subsequent creation of institutions to coordinate the stakeholders involved in the scheme.¹¹⁶

UN-REDD should assist the government where necessary in creating bodies or building capacity in existing institutions to carry out crucial functions, such as: information collection and processing; management of REDD funds; auditing and verification. In order to ensure the effective implementation of REDD, the FBD and the Ministry of Environment (MOE) should clarify their respective functions. The changes in the institutional structure should address the coordination issue between FBD and MOE that, as previously mentioned, hinders the distribution of benefits among the stakeholders involved in JFM projects. In relation to REDD, the main function of FBD is to implement PFM /REDD strategies, while the MOE's prerogative is to negotiate REDD agreements at the international level. To enhance coordination, members of FBD could be included in MOE negotiating teams. This would allow MOE negotiators to gain insights about the main obstacles standing in the way of the implementation of REDD policies, and FBD staff to emphasize the most urgent issues to be addressed and learn about the international context for REDD funding. Moreover, the increased participation would improve transparency and accountability, which, in turn, would allow international donors – e.g. Norway, or the World Bank – to acquire more precise information over the final use of funds.¹¹⁷

Along with the improvement of participation at the institutional level, the involvement of stakeholders could follow the model employed by the Eastern Arc Mountains Conservation Endowment Fund (EAMCEF) in the Morogoro region. The relationship between FBD and MoFEA points to an overlap in institutional structure, which prevents PFM – and consequently UN-REDD – from achieving its full potential. EAMCEF is a good example of how the creation of a permanent independent institution can achieve highly positive results in forest conservation. The organizational structure of EAMCEF envisions the Board of Trustees (BoT) as the main guarantor for the successful implementation of the project. The BoT's main feature is that it includes all the stakeholders involved:

- Two representatives from the Government: one from FBD and one from MOE
- Two representatives from national and international NGOs

¹¹⁶ *Ibid.*

¹¹⁷ Ivar Jorgensen, Norway's delegate for UN-REDD implementation in Tanzania, stressed this point during the meeting held at the Norwegian Embassy in Dar es Salaam on January 7th, 2009.

- Two members of academia: mainly from the University of Dar es Salaam and from the Sokoine University of Agriculture
- Representatives from the private sector: e.g. SONGAS, a company that generates electricity from natural gas
- Representatives from local communities
- Lawyers to discuss land ownership issues

The main scope of EAMCEF is to manage a fund – used to support communities at the local level, helping them acquire the alternatives to meet their needs – whose goal is to create and promote long-term financial mechanisms. The Endowment fund created through EAMCEF is small, but it can be useful in elaborating the prospects for a partnership with UN-REDD and the activities promoted under it. Among these activities, EAMCEF places great emphasis on training and education of the communities that are directly involved, above all regarding more efficient wood-fuel use, namely charcoal. Through its initiatives, EMACEF aims at accomplishing two goals: (i) providing support in finding alternative income-generating activities, and (ii) distributing payments directly to villagers in return for their conservation efforts. This model of comprehensive stakeholder involvement can serve as a basis for crafting an effective REDD strategy.

The role of NGOs

Generally, the activities of NGOs, sometimes carried out in partnership with government ministries, aim at decreasing demand and supply for wood-fuel. National and international NGOs can play a crucial role by providing the necessary linkages between government policies and local communities. NGOs can help raise awareness among communities about the benefits of CBFM, assist with the completion of necessary documentation, and help in the oversight of every day activities. NGOs are crucial actors for the implementation of REDD because, with an expansion of their activities, they could contribute to a REDD activities including a more equitable distribution of payments. By overseeing the meetings of the *Village Natural Resource Committee's* (VNRC) and ensuring that the needs of the poorest group members are heard, they can play a key-role in the implementation of forest management policies that favor poverty reduction efforts as well.

In practice, NGOs like the *Tanzania Forest Conservation Group* (TFCG), WWF Tanzania, and CARE International have achieved substantial results by improving education, awareness, and technical development among local communities; all these are crucial components for a successful forest conservation policy. In particular, TFCG has concentrated in the dissemination of information among local communities through the publication of *The Arc Journal* in English, but also of informative brochures in *Kiswahili* to reach a larger audience within rural communities. The journal and brochures are important tools to raise awareness about the potential of forest conservation and about the progresses of the initiatives. The government, through the activities of the FBD, is promoting similar initiatives by publishing informative brochures on tree plantation methods.

The activities of either local or international NGOs in the field also aim at improving the energy use in rural communities where wood fuel use is a major cause of deforestation and social degradation.¹¹⁸ Improving the thermal efficiency of stoves, which accounts for the highest percentage of inefficiency from fuel-wood use, is one of the main TFCG initiatives. By retrofitting and upgrading the quality of food stoves, TFCG has demonstrated that it is possible to decrease considerably the use of wood fuel in rural and urban communities, thus decreasing carbon emissions from forest degradation.¹¹⁹ Another NGO, the Tanzania Traditional Energy Development and Environmental Organization (TaTEDO), seeks to achieve poverty reduction through the creation of a sustainable modern energy service (SME). By implementing SME, energy use could be rationalized and made more efficient with the promotion of sustainable modern energy technologies through activities of technological adaptation, capacity-building, community mobilization and advocacy aimed at an increased access to sustainable energy.¹²⁰

Energy Sector Reform

As mentioned in the chapter on the drivers of deforestation, Tanzania relies mainly on biomass for its energy supply (91%).¹²¹ Wood-fuel consumption is directly related to population growth and the economics of the energy sector. Moreover, since forest distribution

¹¹⁸ The approach to energy reforms will be examined in more detail in the next session on energy change. However, it is important to mention that the deforestation and degradation rates have a strong correlation with livelihood and quality of life, *ergo* with the status of social degradation (MEM 2005).

¹¹⁹ According to TFCG, while old stoves lose 80% of the energy they use, new stoves decrease this percentage to 30%.

¹²⁰ Available at <http://www.norway.go.tz/Development/CSOs/TaTEDO.htm> and www.tatedo.org

¹²¹ IEA 2006

is not homogenous in Tanzania, various groups of the population face different levels of wood fuel scarcity.¹²² Hence, the increase in demand and the decrease in supply of biomass exacerbate social and environmental degradation problems.¹²³ Population growth in Tanzania has inevitably led to increased pressure on forests and thus to a higher rate of deforestation. Deforestation and degradation are largely caused by inefficient charcoal production and unsustainable firewood consumption.

The energy-poverty relation has direct consequences on health problems among those groups of the population that use charcoal for cooking purposes. Not only is the major portion of the family budget spent on cooking fuels, but the population also pays a high price in terms of health problems. In fact, women and children suffer severe health problems – which at times can be lethal – by inhaling polluting gases emitted by burning charcoal. For this reason, the higher the reduction in charcoal use through alternative energy sources, the better it will be for the general health conditions of the population.

Wood-fuel (firewood and charcoal) accounts for over 97% of the total wood products consumed in Tanzania. In 2003, its total consumption was around 44.8 million m³: 55.7% of this was used as firewood for domestic cooking and heating; 39.7% was employed for the production of charcoal; 2.9% was used by rural industries; and 1.6% was used for processing agricultural crops.¹²⁴ The main concern here should be decreasing the demand for charcoal. Since Tanzania is a developing country, and energy use can be predicted to continue surging as the economy and the population grow, the best ways to decrease demand for charcoal are both the provision of alternative energy sources (while giving the population incentives to use them) and the improvement of efficiency in charcoal production and consumption processes. However, because the energy sector in Tanzania did not develop reliable commercial energy sources, it will be unlikely to find alternatives that would allow a decisive shift away from wood fuel for domestic cooking, which in 2014 will most likely still account for over 80% of total energy use.¹²⁵

The high annual rate of forest depletion in Tanzania should urge policy-makers to reform the energy sector. This change should be carried out on two levels: local and national. At the

¹²² Wood-fuel supply is grouped in three categories: 1) satisfactory wood-fuel supply (Coast, Kigoma, Lindi, Morogoro, Mtwara, Rukwa, Ruvuma and Tanga); 2) Moderate wood-fuel supply (Arusha, Manyara Dodoma, Iringa, Mbeya, Singida and Tabora); 3) Severe wood-fuel scarcity (Dar es Salaam, Kagera, Kilimajaro, Mara, Mwanza and Shinyanga).

¹²³ Information available at: http://siteresources.worldbank.org/INTPRS1/Resources/383606-1205334112622/4722_chap21.pdf

¹²⁴ MEM 2005

¹²⁵ *Ibid.*

local level, the government, supported by NGOs, should focus on the improvement of the thermal efficiency of food stoves (REDD funds could also be channeled towards this key goal).¹²⁶ Using more efficient stoves can reduce demand, but stoves are still a large investment for the poor, and there is no incentive to make that investment while charcoal prices remain low.

The substitution of old, inefficient stoves could be promoted through a series of subsidies and the contribution of REDD funds.¹²⁷ Increased efficiency will contribute to the reduction of demand for biomass. The efficiency of the three-stone firewood stove has been improved from 7-12% to around 20%, while the efficiency of the metal charcoal stove has been improved from around 12% to around 25%, by using metal charcoal with ceramic clay liners. Unfortunately, at the moment only 10-15% of wood-fuel stoves have been improved because of limited extension service capability.¹²⁸ Due to the increasing scarcity of wood fuel, people have also started looking at other opportunities for reducing consumption of wood fuel through the improvement in kitchen management, which include: using firewood to increase burning efficiency, extinguishing firewood and charcoal right after cooking, and building shelters for food stoves to protect them from bad weather.

An interesting alternative solution for producing charcoal for cooking purposes is the one developed in Senegal, where the increasing scarcity of forest resources, due to soaring population and economic growth, pushed local communities to take countermeasures. In 2004, PERACOD¹²⁹ started a project of diversification of sources of energy supply for domestic fuels in the city of Saint Louis, Senegal. The pilot project explored and developed techniques of agglomeration of the fine carbon dust (originating from charcoal) into carbon briquettes. The technology developed by PERACOD consists of a “Rotor Press” that makes possible the valorisation of biomass carbon dust by blending it into a mix of grass and clay. The rotor press is able to create a surrogate of bio-carbon that can reutilize carbon dust and

¹²⁶ Given the entity of wood fuel consumption, unless the energy problem is solved – through the development of alternative energy sources – REDD initiatives are unlikely to work.

¹²⁷ Another well-explored alternative could be the introduction of solar stoves that have a double advantage in Tanzania: (i) it would help cut charcoal use; and (ii) it would improve health conditions. Although this is a valuable solution, the team did not directly see the deployment of any solar stoves in the villages visited in Tanzania.

¹²⁸ MEM 2005

¹²⁹ *Programme de Promotion de l'Electrification Rurale et de l'Approvisionnement en Combustible Domestiques*

diminish deforestation originating from charcoal production.¹³⁰ This innovation could indeed be explored in Tanzania as a viable – albeit temporary – solution for charcoal substitution.

At the national level, the debate revolves around the choice to build a national grid or to proceed with off-grid rural electrification projects. However, given the limited financial resources of Tanzania, it is unlikely that the government will be able to provide the whole country with such an investment in infrastructure. In order to boost its economic growth, Tanzania needs to create an electricity market that is accessible and, most importantly, reliable. At the moment, 80% of the electricity produced in the country originates from hydropower.¹³¹ Hydro represents a viable and sustainable energy-generation resource, but it cannot be considered an entirely reliable source of energy on its own.¹³² Firstly, its capacity is not fully developed,¹³³ and secondly, it depends on natural conditions. In cases of periodical or prolonged droughts, hydropower generation capacity shrinks dramatically.¹³⁴

Developing a national grid in Tanzania may be prohibitive and not cost-effective. The country is very large and it would be economically unfeasible to build high voltage transmission lines to connect power plants to extremely remote rural areas.¹³⁵ The problem is that rural Tanzania is characterized by scattered groups of people; even when investments are made in electricity transmission and distribution, there often are no further investments in socially-valuable structures – e.g. schools, hospitals – to match them. This is why rural electrification schemes are not entirely effective. Yet the country needs a reliable power system to develop; therefore it might be economically more viable to develop energy projects at a smaller scale to accommodate the needs of remote rural communities.¹³⁶ The greatest potential for rural electrification arises from harnessing the potential of small hydropower (SHP).

¹³⁰ Document available at: http://www.peracod.sn/IMG/pdf/strategie_poussier_rotor_press_SL_final.pdf

¹³¹ Data obtained during the interview with Christian Peter, at the World Bank Headquarters in Dar es Salaam.

¹³² MEM 2005. It is worth mentioning that many environmentalists consider certain types of hydropower as detrimental to biodiversity conservation efforts, because of concerns over downstream biodiversity or increased methane emissions into the atmosphere.

¹³³ The potential production capacity for hydropower is estimated at 4,700MW. At the moment, only 561MW are generated by hydro-power (MEM 2005).

¹³⁴ The personnel of Agenda, an NGO based in Dar es Salaam, brought the aspect of hydropower unreliability in Tanzania to our attention, and stressed the importance of finding alternatives for electric power generation.

¹³⁵ High voltage electric transmission lines can actually be seen along the main arterial roads, but do not reach most remote areas.

¹³⁶ Kabaka, K.T. and Gwang'ombe, F. (2007), "Challenges in Small Hydropower Development in Tanzania: Rural electrification Perspective", from *International Conference on Small Hydropower – Hydro Sri Lanka*, 22-24 October 2007.

Alternative energy sources such as hydropower and natural gas are available and, according to some studies, cheaper than charcoal (in particular when negative externalities and user costs are factored into the total costs). However, there are several problems with the use of these alternatives at the moment. The first is that, while the stream of energy of these alternative sources may be cheaper, and sufficient infrastructure already exists in some cases, the household installations and appliances needed to use these energy sources are too costly an investment for most families. Subsidising such appliances might help overcome this hurdle. A second problem is that the units in which these energy sources are sold (e.g. gas cylinders) are often too large, requiring a large monetary payment at once, while charcoal can be bought in small quantities and the payments thus divided and dispersed. Thought should therefore be given to the “packaging” and distribution of these energy sources.¹³⁷ It is also essential that the carbon emissions of these alternatives are accounted for when assessing the climate impacts of the REDD program.

An additional problem is market price distortions caused by the government taxing these energy sources, especially electricity, at high rates. These taxes should be removed in order to remove the distortion and change the population’s incentives for using alternative energy sources rather than charcoal. In the long term, it might even be efficient for the government to initially subsidise some of the use of alternative sources, encouraging households to make the additional investments needed to use these sources, and getting them accustomed to the change in lifestyle.

Unless foreign investors – e.g. the World Bank – provide substantial investments on the expansion and enhancement of the national grid, the financial capability of the Government of Tanzania will not be enough to cover the huge costs. A policy to solve the problem of energy demand in Tanzania should be geared towards the three major cities.¹³⁸ In this case, several opportunities could be considered: (i) use agricultural waste to produce electricity; (ii) use co-generation in the industrial sector; (iii) promote the use of gas for cooking; (iv) develop sustainable energy alternatives.

¹³⁷ The size of charcoal bags is becoming smaller and smaller to accommodate the consumers’ needs. The price of charcoal is such that it is more convenient for a family to purchase it instead of gas canisters. With a 30kg charcoal bag, an entire family (the average Tanzanian household is formed by about 5 members) can cook up to a month. Gas canisters are too expensive to justify the higher investment of buying gas stoves (MEM 2005; interview with Agenda).

¹³⁸ Dar es Salaam, Morogoro and Arusha currently account for 75% of the demand for charcoal and for much of the overall electricity demand.

Given the financial constraints but also the natural endowments of Tanzania, the energy sector should promote a portfolio of energy alternatives, so that the focus of energy generation capacity can be directed towards the development of wind power, solar¹³⁹ and small hydro technologies. The first wind farm on a commercial scale in sub-Saharan Africa is now under construction in central Tanzania (*Singida*), one of the poorest areas of country. Wind power has a great potential for electricity generation. In fact, with the construction of this 24 turbine wind farm, it will be possible to meet almost 10% of Tanzania electricity demand.¹⁴⁰ Even though wind power is characterized by intermittency, it will ease the reliance on hydropower, which, as mentioned earlier, is vulnerable to droughts.¹⁴¹ This, however, still relies on the technological developments of solar and wind power. While good positioning of wind rotors or solar thermal panels could enhance electricity production, power outages due to intermittency would still affect electricity production capacity. This is why these technologies have to be integrated to a system of power storage, such as pumped hydro storage. Unfortunately, at the moment battery power storage technologies are still very expensive; however, it is a promising technology for the longer-term, especially if coupled with the development of other alternative energy sources.

Reforms of the Agricultural Sector

Agriculture in Tanzania is one of the activities contributing the most to deforestation. Either government-led or spontaneous agricultural expansion should be accurately planned in order to promote a wiser use of forestland that is not particularly fertile. As emerged through the series of interviews that the SAIS team carried out in Tanzania, land planning and zoning are also crucial components that affect land tenure arrangements, forest management and conservation.

Another concern is rendering agricultural use of land more efficient so that less land can yield higher produce. Ideally this should be achieved by investing in land that is already used for agriculture to make it more productive. This would decrease the demand for new

¹³⁹ Coal reserves in the country amount to 304 million tonnes of proven reserves (while a total of 1,200 million tonnes of coal reserves is estimated to be available) (MEM 2004; MEM 2005). This is indeed an alternative to charcoal production and use, but it is inconsistent with the goal of reducing carbon emissions through forest conservation.

¹⁴⁰ Dickinson, D. available at <http://news.bbc.co.uk/2/hi/business/7358776.stm>

¹⁴¹ The drought of 2006, for example, caused power outages because energy supply was unable to keep up with energy demand. The Tanzanian authorities had to introduce daytime power cuts. See also: <http://news.bbc.co.uk/2/hi/africa/4673130.stm>

agricultural land and therefore reduce the deforestation led by agricultural expansion. Agriculture is mostly in the hands of small farmers, cultivating small plots, mostly by hand. It is also weather-dependent and mostly rain-fed. To deal with this issue, there is a need for capacity building – i.e. providing the population with the knowledge and technology for higher-yield agriculture. Deforestation causes wood fuel scarcity and this, in turn, exacerbates the living conditions of the population living in rural areas. By improving land productivity and reducing deforestation, it could be possible to mitigate the effect of scarcity on women and children, who are the main collectors of wood. The time they spend collecting wood fuel is increasing year by year because they have to travel – mostly by foot – to far destinations for wood collection. Improved forest management, enhanced wood fuel efficiency and rural electrification would bring about social benefit because both women and children could spend less time collecting wood and devote more time to other, more productive activities. Children, for instance, might have time to attend school, while women could work the land, making it more productive, or engage in other sustainable income-generating activities

There is also a need for capital investment in inputs such as fertilisers, irrigation infrastructure and technological aids. Since most of the population is too poor to fund such investment, it must be done by private commercial actors if, or with government support, at least initially. One feasible solution to improve land productivity could be to have farmers pool their resources together to form co-operatives as most individual land holdings are very small (around 1-2 ha). By creating co-operatives, farmers may find it easier to deal with the economic constraints of purchasing fertilizers, and might do it in a more environmentally sustainable way.¹⁴²

¹⁴² Farmers might also be able to afford organic fertilizers by pooling their resources together. (C. Meshack, TFCG).



VII. Conclusion: some global lessons

The report has purposefully taken a country-specific approach. Tanzania was selected as a case-study given the inherent difficulties of reducing deforestation in a low-income country, highly dependent on biomass for its energy needs, and characterized by a historically high deforestation rate (linked to demographic growth and poor forest management practices). The basic sources of deforestation, and the likely social implications of tackling them, have been highlighted in Section IV. The main obstacles which the effective implementation of UN-REDD is likely to face in Tanzania were outlined by Section V.

The appropriate countermeasures to drivers and obstacles (identified by Section VI), were, by necessity, country-specific. The report has argued that in Tanzania, REDD should build upon existing Participatory Forest Management practices, while reforms in the energy and agricultural sectors – as well as improved institutional practices – will be an essential counterpart for the success of the program.

There are, however, some issues that transcend the specificity of the Tanzanian case. A number of Tanzania-specific observations will be useful for the global debate about REDD as well. This concluding section aims at drawing these “global lessons”, moving the discussion from the particular to the general level. The chapter will be structured around six issues: leakage, level of implementation, land-tenure, equity, international incentives, energy and agricultural needs.

Leakage

Leakage occurs when a reduction of deforestation in one area is at least partially matched by increased deforestation in another area. This happens when the agents performing the deforesting activity simply shift away from a conservation area and continue their activities in another area of the country (*activity-shifting leakage*). Conversely, leakage can occur by altering demand-supply equilibria, thus working through *market mechanisms* (e.g. reduced deforestation reduces the supply of timber and drives up its price; the increase in price consequently stimulates an expansion of deforesting activities in other areas).¹⁴³ Leakage is a serious problem when it comes to any national REDD strategy, because local projects, albeit successful, might fail to deliver any net emission reductions from reduced deforestation in the aggregate.¹⁴⁴

The Tanzanian case proves the verity of the statement that leakage can never be completely overcome. Yet it also suggests some ways in which leakage can be minimized. One method to mitigate the problem is to strategically disperse conservation projects around the national territory; all these separate projects can then be gradually expanded in a second phase. By creating a strategy whereby the various projects are not so far from each other as to be completely isolated, and not so close to each other as to leave entire parts of the national territories uncovered, REDD activities and PFM can make it a lot more difficult for deforesting agents to stealthily shift to new areas.¹⁴⁵ This should hold true for other countries involved in pilot REDD projects, especially large countries.

If strategic planning can favor the monitoring of activities such as illegal logging, strategic conservation projects will, not on their, own satisfy the energy needs of Tanzania's rural population. This is why, in the final analysis, leakage can be brought to tolerable levels only with the implementation of practices such as sustainable charcoal production.¹⁴⁶ This should be complemented by the enhancement of alternative sources of energy, as the countermeasures' section of this report has highlighted. As many developing countries are reliant on biomass for their energy consumption, this Tanzanian observation can also be a useful lesson to take into account for the implementation of REDD throughout the developing world.

¹⁴³ Madeira, p. 45.

¹⁴⁴ This may occur if leakage is equal to 100 % or more, meaning that for a reduction of emissions by 100 in one area, emissions increase by at least 100 in another area.

¹⁴⁵ The necessity for this strategic vision was stressed by C. Meshack, TFCG Executive Director, in an interview with the team on January 5th, 2009.

¹⁴⁶ "Sustainable charcoal" can mean either of two things. It can imply replanting of trees to ensure the environmental sustainability of charcoal-production (possibly accompanied by efficiency gains through more efficient kilns). It can also mean the utilization of grass and clay (rather than trees) to produce charcoal; this technique is already adopted in St. Luis, Senegal and could be exported to Tanzania (More information available on-line, at: http://www.peracod.sn/IMG/pdf/strategie_poussier_rotor_press_SL_final.pdf).

Finally, the Tanzanian case shows that community-run monitoring and alternative sources of income are also key components of any leakage-minimizing strategy. Evidence suggests that when the government involves local communities in the management and monitoring of Tanzania's forests, deforestation rates are reduced.¹⁴⁷ Local communities should be financially rewarded for their involvement, which can remedy the government's lack of capacity to reach remote areas of the country. By the same token, the government must stand by the communities to guarantee protection in the case of armed attempts to scare villagers during their patrols.¹⁴⁸ Furthermore, the government could coordinate remote sensing activities at a national level, while trained communities could conduct sample verifications on the ground.¹⁴⁹ A government-community partnership is likely to deliver positive conservation results in the developing countries where UN-REDD will be launched.

Level of Implementation

The global debate surrounding REDD often revolves around its scope: should REDD activities take a national or a project-specific approach? A national approach would base the distribution of carbon funds on national baselines for forestry emissions accounting, while a project-based approach would award funds directly to project implementers.

A national approach would certainly be a guarantee that REDD payments only go to countries which successfully reduce overall deforestation rates; it would, thus, take leakage into account and effectively reward only emission reductions. Yet a national approach might also discourage grassroots participation in REDD projects. In the case of an individual project being successful at reducing deforestation in an area, a simultaneous increase in deforestation in other parts of the country can lead to a situation where funds might not be awarded to the country at all or – if some funds are awarded – the successful project implementer might receive only a small fraction of nationally managed funds. Thus, in countries which lack the governmental capacity to avoid leakage, a purely national approach would – especially during the pilot-phase of REDD – discourage the participation of virtuous communities, NGOs, and entrepreneurs.¹⁵⁰

A project-level approach would stimulate bottom-up participation in REDD, creating a framework inclusive of the private sector and the nonprofit sector. Successful project implementers will constantly have the right incentives to reduce deforestation. However, a project-level approach would be subject to the problem of leakage, meaning that REDD payments might go to projects in

¹⁴⁷ Blomley et al., p. 389. See also *Case Studies from the Eastern Arc Mountains area of Tanzania*, Ministry of Natural Resources and Tourism, Forestry and Beekeeping Division (November 2008), p. v.

¹⁴⁸ The presence of armed individuals encroaching on village land in order to conduct deforesting activities has been pointed to the team by staff of CARE International and WWF Tanzania during site visits, January 2009.

¹⁴⁹ Madeira, p. 40.

¹⁵⁰ Madeira, p. 33.

countries which fail to reduce their national emissions from deforestation and forest degradation.¹⁵¹ Whilst there might be positive forest conservation benefits in the project sites, the overall aim of reducing climate change impacts would be a failure.

The Tanzanian case perfectly reflects this dichotomy. It has been noted earlier in the report that Participatory Forest Management (PFM) is a successful but limited reality in the country; PFM has reduced deforestation where it has taken root, but it is only established in around 10% of the country's forests.¹⁵² Therefore, it would be hard to find evidence of PFM having already reduced the deforestation rate nationally at such an early stage. Similarly, REDD projects are likely to begin with a limited scope (a few projects scattered in different regions) which would gradually expand. If payments are from the outset made conditional on reduced deforestation at the national level, Tanzania is unlikely to receive REDD payments for a number of years, thus depriving the country of the additional incentives needed to improve current sustainable forest management practices.

This report favors a hybrid approach for UN-REDD. Initially, payments could directly reward successful projects, at least partly. As the scope of UN-REDD projects expand, the system could switch to a national approach, beginning to reward only the effective reductions of deforestation at the national level. This approach would be inclusive in the short-run and would allow time for UN-REDD projects to expand, while at the same time it would take care of leakage in the medium to long-term.

Land-tenure

Almost half of Tanzania's forested lands fall under the general land category, as it has been noted earlier in the report. General land is "open-access" for everyone; forests in this category of land are characterized by "insecure land tenure, shifting cultivation, annual wild fires, harvesting of wood fuel, poles and timber, and heavy pressure for conversion to other competing land uses, such as agriculture, livestock grazing, settlements and industrial development".¹⁵³

It has been estimated that the majority of deforestation in Tanzania takes place on general land.¹⁵⁴ General land (with its open-access feature) is subject to a classic *tragedy of the commons*, where undefined user rights lead to the over-exploitation of the resource. The same tragedy can be

¹⁵¹ Madeira, pp. 33-34.

¹⁵² *The Arc Journal*, p. 3, and Blomley et al., p. 380.

¹⁵³ Zahabu, p. 1.

¹⁵⁴ Zahabu, p. 1.

assumed to take place in other countries with open-access lands characterized by insecure land tenure, even though some differences may be observed.

As a global lesson, it should be noted that REDD necessitates clearly defined land-tenure systems to work; REDD initiatives are unlikely to work well at a national level as long as vast areas of a country are open-access, as severe deforestation leakage can occur in these lands. Again, the Tanzanian case-study is not only indicative of a common problem but also points to a potential solution. In many instances, local communities in Tanzania stopped harvesting forests unsustainably “as they realized it’s *their* resource”.¹⁵⁵ This highlights the need of expanding community-based forest management to larger sections of general land, spreading “rights, responsibilities, and revenue” to local communities for a more effective management of common forests.¹⁵⁶ REDD initiatives can provide the presently-missing monetary incentives for local communities to bring open-access forests under a regime of commonality and sustainable forest management.

Thus, initiatives such as UN-REDD can both be *affected by* and be an *agent of change of* land tenure systems. Insecure land tenure can lead to the failure of REDD, but REDD can also help define and secure land tenure rights, providing the incentive for communities to do so. The Tanzanian case can serve as a lesson that the involvement of communities is essential: local practices aimed at community-based sustainable forest management can be the springboards for the successful implementation of REDD initiatives and the clarification of land tenure systems.

Equity Concerns

It has been noted in Section V that the distribution of REDD funds to individual stakeholders, albeit ideal, might be pragmatically unfeasible, given the often-unclear ownership and user rights over land. Moreover, individual transfers would entail high transaction costs, placing a hefty burden for the overstretched ministries of developing countries.¹⁵⁷ This rings true for Tanzania as well, where the Forestry and Beekeeping Division (FBD) lacks the human and financial resources to extend their activities to reach the remotest communities to the extent ideally required.

A pragmatic solution being proposed in the international discussion over REDD payments is to delegate the distribution of benefits to local institutions.¹⁵⁸ In Tanzania, this would mainly imply

¹⁵⁵ CARE International Staff, interview in Turiani, January 9th, 2009.

¹⁵⁶ Peter Sumbi, WWF Tanzania, interview in Dar es Salaam, January 6th, 2009.

¹⁵⁷ *Making REDD Work for the Poor*, p. 42.

¹⁵⁸ *Making REDD Work for the Poor*, p. 42.

the involvement of the district councils and/or the village councils. The problems associated with the channeling of funds via the district councils (highlighted by Section V) are primarily related to the recurrent corrupt practices due to a distorted structure of incentives (whereby the districts have to send to the central government almost the entirety of the revenue they collect). Involving village councils could also be problematic, given concerns over possible elite capture of the funds. This has been highlighted by the FBD and by independent scholars.¹⁵⁹ Moving from the Tanzania-specific discussion to the international debate over REDD, one finds similar concerns being expressed.¹⁶⁰

Once again, Tanzania is indicative of the potential solution to a global problem. As this report has argued elsewhere, Tanzania is blessed with a variety of proactive national and international NGOs who work in many of the country's villages in projects ranging from sustainable forest management to micro-finance and community development. Some of these NGOs – such as CARE International and WWF Tanzania – established a system whereby NGO workers retain oversight rights over the management of funds collected by village councils thanks to the NGO-sponsored environmentally sustainable activities.¹⁶¹ By the same token, well-respected NGOs could retain financial oversight over how the REDD funds are used by the village institutions, thus reducing the risk of elite capture. This could be a rule of thumb for the implementation of REDD internationally, even though the report does recognize that countries differ with regard to the extension of NGO presence, and trust placed in NGOs by local people.

International Incentives

Until now this report has looked at supply side issues of REDD and UN-REDD, i.e. those related to the suppliers of carbon credits (the agents involved in conserving Tanzania's forests). The work so far has been based on the presumption that global carbon markets and emission regulations will be implemented sufficiently so as to provide enough incentives for the conservation of forests under REDD. However, there are a number of uncertainties regarding the financial incentives, especially given that the international community has yet to reach an agreement on a post-Kyoto treaty.

¹⁵⁹ See *Case Studies from the Eastern Arc Mountains of Tanzania*, FBD, p. v (“inequality in benefit appropriation existed ... with either the rich or the very rich households getting more benefits than their very poor and poor counterparts”). See also Blomley et al., p. 389 (“poor facilitation of participatory forest management ... can result in a small group of villagers ... capturing and retaining benefits to the detriment of others”). While these observations regard participatory forest management practices, the same concerns are valid when it comes to distributing UN-REDD payments.

¹⁶⁰ *Making REDD Work for the Poor*, p. 42.

¹⁶¹ The team gained this information through a site visit to the village of Pemba on the Nguru mount, along the Eastern Arc Mountains, with the staff of CARE International and WWF Tanzania on January 9th 2009. The team participated in the village council micro-finance meeting and engaged in discussions with members of the village council.

One of the keys to the success of any REDD mechanism will be the amount of money that can be earned through it by the agents who own, control, and utilize the forests. In this regard, the price of carbon credits will be a major determinant. The money earned by conserving forests would have to be more than the revenue generated by the alternative uses to which the land could be put (i.e. more than its *opportunity-cost*). Estimates of the amount that could be earned through REDD vary considerably depending on the source of the calculation. The World Bank estimated that carbon sequestration services through emissions reductions due to forest conservation could provide revenue of \$700-\$1,500 per hectare in Tanzania.¹⁶² A paper by R.H. Butler on the other hand, posits that given the initiatives likely to be undertaken as the urgency to address climate change increases, the revenue earned through carbon credits could range from \$1,571 per hectare annually to \$ 11,784.¹⁶³

These estimates clearly depend on the assumptions made regarding the likely price per ton of carbon. Zahabu uses the low estimate of carbon being priced at \$5 per ton; he therefore estimates that the average Tanzanian village could earn around \$6,500 every year from the sale of forest carbon credits.¹⁶⁴ However, many estimates of the future price of carbon are much higher; a study by the Environmental Defense Study, specifically, projects that even by including forestry credits in the carbon market, price per ton of carbon is likely to be \$16 in 2012, increasing up to \$40 by 2030.¹⁶⁵ This should ease any fear that forestry credits might “flood the carbon market”, and should guarantee better revenue prospects for the holders of forestry credits.

The exact nature of the pricing mechanism would depend, among others, on whether the REDD market is a compliance or voluntary one, and whether carbon credits can be front weighted.¹⁶⁶ A more specific estimate will probably only be possible after the international community decides on a post-Kyoto agreement at the Copenhagen conference in December 2009. This agreement will have to ensure that the price per ton of carbon sequestered will be high enough to prevent the proprietors of the forests from using the forests for other purposes, including but not limited to agriculture, industrial development, commercial harvesting, firewood collection, and cultivation of alternative crops such as those used for bio-fuels. This brief note regarding demand side issues was included to point out that this report is indeed aware of these issues. As the focus of the report is on local, supply side factors, the authors have made the working assumption that the

¹⁶² *Putting Tanzania's Hidden Economy to Work*, p. 18.

¹⁶³ http://news.mongabay.com/2009/0330-palm_oil_vs_redd.html

¹⁶⁴ E. Zahabu, in *The Arc Journal*, Issue 21, p. 26.

¹⁶⁵ Pedro Piris Cabezas and Nathaniel Keohane, Environmental Defense Fund, p.8.

¹⁶⁶ http://news.mongabay.com/2009/0330-palm_oil_vs_redd.html

revenue generated through an international agreement and consequent carbon market initiatives will be sufficient to create adequate incentives for local actors to preserve the forests.

Energy and Agricultural Needs

Even under a scenario of full coverage of the opportunity-cost of preserving the forests through REDD payments, strategies to reduce deforestation in developing country will necessarily have to deal with the energy needs of the populations who rely on the forests as their main source of energy supply. The report has called for energy sector reforms to complement REDD payments to Tanzania (Section VI); it seems difficult to envision successful, national-scale anti-deforestation measures when biomass, in the form of firewood and charcoal, constitutes more than 90% of the country's energy supply (at least as long as its production and consumption is unsustainable).

The exact figures might differ, but most developing countries tend to rely heavily on biomass for their energy supply. Therefore, *simultaneous* energy reforms will be a key factor for the worldwide success of REDD. Charcoal is usually used for cooking in and around urban areas, while firewood is generally used for cooking (and heating) in the country-side. Possible solutions to reduce the use of biomass include: (i) improve the efficiency of existing kilns and stoves; (ii) promote sustainable wood harvesting through replanting activities; (iii) promote LPG cylinders (in rural areas) and the development of natural gas infrastructure (in the cities) to meet cooking needs. These and other measures could decrease the populations' reliance on the forests to satisfy their basic energy needs, thus giving REDD systems a higher chance of success.

By the same token, REDD will have to deal with the agricultural needs of developing countries. In the case of Tanzania, the agricultural sector employs more than two thirds of the country's population and agricultural expansion is one of the main drivers of deforestation.¹⁶⁷ Similar features can surely be traced in other developing countries involved in the pilot-phase of UN-REDD.¹⁶⁸ It seems unrealistic to ask these countries to substantially reduce deforestation as long as they need new lands to grow enough food to feed growing populations. This report has called for efforts to improve the productivity of land being undertaken *in parallel with* the launch of UN-REDD projects in Tanzania.

¹⁶⁷ See Section IV of this report.

¹⁶⁸ For example, agricultural expansion was cited to the team as the main driver of deforestation in Viet-Nam by Dr Pham Manh Cuong, the Vietnamese envoy to Washington, D.C. for REDD negotiations. Interview conducted in October 2008.

In the final analysis, REDD is a system of international payments aimed at providing countries with tangible incentives to preserve forests rather than generating income by cutting them down. The expectation is that this will be implemented through payments to the owners/users of forests, as well as through changes to national policy, institutions and the establishment of an appropriate monitoring regime. Yet, very often, the owners/users of these natural resources have little option besides cutting down the forests to satisfy their basic needs. This is why initiatives such as UN-REDD will be successful only if it will be integrated in a strategy of overall development, whereby the energy and agricultural needs of developing countries are given the same consideration as the global benefits deriving from the conservation of the world's forests.

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