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Case Example: Humbo, Ethiopia

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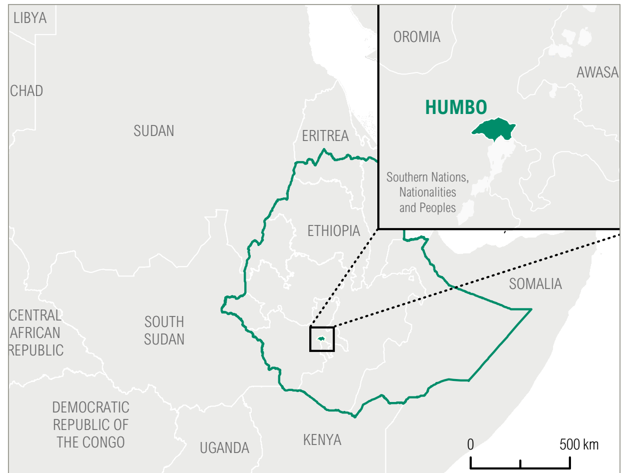
SUMMARY

Ethiopia has experienced dramatic deforestation and soil degradation. Less than 3 percent of the country's native forests remain (UNFCCC 2009), largely the result of pressures from crop farming, livestock grazing, and charcoal production (Biryahwaho et al. 2012). Soil degradation contributes to economic losses of $1 billion to $2 billion annually, in a country where farming provides approximately 85 percent of the total employment and 47 percent of GDP (Tedla 2007). The Humbo District of Ethiopia, located 420 km southwest of the Ethiopian capital Addis Ababa (Map 1), reflects this broader national situation. The forests surrounding Humbo were largely cleared by the late 1960s (Brown et al. 2011), and an estimated 85 percent of Humbo residents lived in poverty in the early 2000s (World Bank n.d.).

In the early 2000s, the non-profit development organization World Vision—with financial and technical support from the World Bank and its BioCarbon Fund—developed a program to restore native vegetation to approximately 2,700 hectares in the Humbo region. The Humbo project encourages farmers to apply a practice called "Farmer-managed natural regeneration" (FMNR), where farmers allow native trees and shrubs to regrow from live stumps, underground root systems, and soil seedbanks. Farmers selectively prune branches to maintain desired densities. The woody perennial plants interact with soils and crops to create an agro-ecological system that improves conditions for crop growth. The Humbo project also involves more careful livestock management to prevent further landscape degradation, as well as closing off entire degraded areas to both human and animal intrusion since 2006 to allow native vegetation to recover. Seven community cooperatives with legal land title managed the project and established a system to monitor restoration and associated carbon stock improvements (Rinaudo et al. 2008).



TIME PERIOD: 2006 to present

AREA RESTORED: 2,700 hectares

TYPE OF RESTORATION: Farmer-managed natural generation (FMNR) (active restoration)

HUMBO BEFORE

HUMBO AFTER

Project preparations started in late 2004, field operations began in 2006, and the World Bank committed to an emissions reduction purchase agreement in 2009 (Biryawaho et al. 2012). Benefits, both expected and already emerging, include (Brown et al. 2011):

- Projected sequestration of approximately 880,000 tons of carbon dioxide equivalent for an operating lifetime of 60 years.
- Projected sale of more than 338,000 tons of carbon credits by 2017, with guaranteed purchase by the BioCarbon Fund.
- Less flooding, erosion, and siltation already observed by community members.
- Increase in domestic firewood availability already being noted by community members.
- Emerging increase in presence of wildlife.

WHICH FEATURES AND KEY SUCCESS FACTORS WERE EXHIBITED?

Restoration in the Humbo region exhibited a number of the features and key success factors of forest landscape restoration.

Motivate

Factors motivating the Humbo restoration effort included:

- **CRISIS EVENTS.** Forests surrounding the township of Humbo were largely cleared by the late 1960s (Brown et al. 2011). The resulting land degradation led to soil erosion, periodic landslides (Biryahwaho et al. 2012), and diminished availability of forest products—a landscape providing few benefits to the local community (Beyene 2006).

- **BENEFITS.** Restoration provided economic and environmental benefits. Economically, it provided a new revenue stream for farmers in the form of carbon sequestration payments, and indigenous tree species are providing income or subsistence through firewood, berries, fruits, and nuts (Garrity et al. 2010). Restoration also is increasing the availability of grasses that farmers could harvest for feeding their livestock and for selling to others (Biryahwaho et al. 2012). Environmentally, restoration is reducing erosion, improving soil health, protecting groundwater supplies, sequestering carbon, and restoring wildlife habitat. More than 3,000 households are reaping the benefits from restoration in the area (Reynolds 2012).

Enable

Several enabling conditions were in place to facilitate restoration in Humbo, namely:

- **ECOLOGICAL CONDITIONS.** Source populations of native trees and shrubs were present in the form of live tree stumps and root systems. Tree nurseries complemented these populations (Brown et al. 2011). While conventional restoration approaches often require the costly replanting of trees, over 90 percent of the Humbo area did not need replanting from nursery stock. Forest regeneration in Humbo was done almost entirely through the selection and pruning of existing tree stumps. Tree planting only occurred where no living tree stumps remained within the forest and on designated woodlot areas outside of the forest boundary (Rinaudo et al. 2008).

- **MARKET CONDITIONS.** Reducing the alternative market uses of the land to be restored was critical to the success of restoration in Humbo. Competing demands for alternative use of restored lands were discussed and addressed at community meetings. Different user groups of the communal lands—including charcoal makers, fuelwood collectors, and those that graze their livestock and cut hay for animals—were presented with alternative economic benefits. Many community members relied entirely on areas that were to become fenced off for restoration, so alternative livelihood options were essential. For charcoal makers and wood sellers, alternative income generating activities were investigated, including employing them as guards of communal lands. Some alternative livelihood options included the introduction of honey-bee hives, poultry, fruit trees, medicinal plants, and spices. Farmers who used to graze their livestock in the communal land were allowed to harvest hay from the closed areas (Kebede 2006). Separately, pilot voluntary transactions for carbon sequestration were beginning to emerge during the inception of the Humbo project. Thus, the Humbo project could leverage nascent interest in potential markets for carbon, although it took time for farmers to recognize this as something valuable (World Bank n.d.)

- **POLICY CONDITIONS.** The emergence of more clear and secure land and natural resource rights for farmers was a very important enabling factor. During the Humbo project, land ownership shifted from the state to local people via the Federal Rural Land Administration and Land Use Proclamation No. 456/2005 and Rural Land Administration and Utilization Proclamation No. 53/2003 (UNFCCC 2009).

- **SOCIAL CONDITIONS.** The Humbo project empowered local people to make their own decisions about implementing FMNR practices. Focus groups were engaged through a participatory rural appraisal in each community to assess interest in restoring land and willingness to make necessary changes to land use practices in order to achieve FMNR (Brown et al. 2011). In addition, community members saw tangible benefits from restoration, including grass for feeding livestock that could be sold either within or outside the membership of the cooperative society (Biryahwaho et al. 2012).

In FMNR, the "farmer-managed" part has developed to the point that enclosures no longer need physical fencing. Instead, a new phrase—"social fencing"—has developed to indicate that communities agree not to interfere with such projects. In Tigray, where it is most popular, social fencing took about a decade to perfect by regular demonstration of successes via farmer group visits to pilot project sites, as well as guidance and awareness-raising by district development agents and extension workers. Negotiations and consensus reaching with local communities and benefit sharing is at the core of the success (Dale 2010).

- **INSTITUTIONAL CONDITIONS.** From the outset, the Humbo project was developed through a joint collaboration among community, local, state, and national authorities (Brown et al. 2011) so that responsibility for restoration was clearly defined and coordinated. World Vision played a lead role organizing the project, managing interactions with the World Bank, and coordinating activities among technical trainers, communities, and others (Brown et al. 2011). Furthermore, the Humbo project triggered the formation of community cooperative societies, which received training and capacity building (Biryahwaho et al. 2012), and which managed the on-the-ground implementation of the project and its practices.

Implement

The Humbo project had capacity and resources for implementation, including:

- **LEADERSHIP.** World Vision Ethiopia and Australia championed the Humbo project, driving its inception, strategy, and follow-through. They played a prominent role in organizing communities as well as soliciting and mobilizing funds for the project. World Vision also helped develop the Project Implementation Notes (PIN) and Project Development Documents (PDD), identified and engaged carbon buyers, and entered into an Emissions Reduction Purchase Agreement (ERPA) with the World Bank BioCarbon Fund on behalf of the communities (Biryahwaho et al. 2012).

- **KNOWLEDGE.** World Vision advanced restoration "know-how," particularly farmer-managed natural regeneration, among local people through training programs and by encouraging farmer-to-farmer engagement. Training also covered management tips on community cooperative societies, silviculture, and project finance (Reynolds 2012).

- **TECHNICAL DESIGN.** The project leveraged farmer-managed natural regeneration practices, which have proven to be effective elsewhere in African drylands, and are low-cost and easily replicable (Hagbrink 2010). Insights and success from Niger in FMNR inspired the development of FMNR in Ethiopia (Brown et al. 2011). Species endemic to the area were used to restore the forest, including *Acacia spp., Aningeria adolfifericii, Podocarpus falcatus, Olea africana, Cordia africana, Croton macrostachytus, Erthrina spp., Ficus spp,* and *Hagenia abyssinica,* among others. Naturalized species such as *Grevillea robusta* and *Eucalyptus globulus* were also considered for planting in blocks and on the perimeter of the restoration sites (UNFCCC 2009).

- **FINANCE AND INCENTIVES.** One revenue stream that helps make restoration in the economic interest of the land managers comes in the form of payments for carbon sequestration. The World Bank's BioCarbon Fund pledged to buy 165,000 tons of Carbon Emission Reduction credits from the project, which will provide local communities with an income stream of more than US$700,000 over ten years (World Bank 2011). The credits are in compliance with the requirements of the Clean Development Mechanism.

- **FEEDBACK.** World Vision led a baseline analysis of the candidate restoration landscape, including its vegetation cover and estimated carbon content. It then developed a comprehensive performance monitoring plan (Brown et al. 2011) that covered baseline greenhouse gas emissions, pre-existing vegetation, area planted, tree species composition, and forest structure. The monitoring system estimated changes in carbon stocks by collecting data from permanent sample plots, accounted for leakage, and measured the environmental and socioeconomic impacts inside and outside the project boundary (Biryahwaho et al. 2012).

LOOKING FORWARD

The Humbo project is a recent forest landscape restoration initiative, so it is premature to make judgments regarding its long-term success. However, it has had an auspicious start and exhibits many of the key factors of success, including having a performance monitoring system—something many other case examples throughout history were missing. Nonetheless, performance against a couple of key success factors highlights some considerations that are important for this effort and for others trying to replicate it, namely:

- **BENEFITS.** The Humbo project launched with high expectations that local communities would reap attractive economic benefits from restoration. Communities are reaping the rewards of increased supplies of firewood, fodder, and wild fruits (Rinaudo et al. 2008), but farmers had to wait nearly four years before starting to receive carbon payments (Biryahwaho et al. 2012). And even once payments started to flow, prices per ton of carbon were low, which has impacted interest in further participation by some farmers (Tofu 2011). This development suggests the need to adequately manage expectations about the type and size of benefits from restoration from the outset. It also suggests that restoration initiatives avoid overly linking benefits to one commodity or revenue stream; a plurality of benefits is a wiser option in terms of motivating action and sustaining it. In the case of the Humbo, ecotourism is now being explored as an additional income-generating activity for participants (Biryahwaho et al. 2012).

- **TECHNICAL DESIGN, INSTITUTIONS, AND BENEFITS.** The technical design of the Humbo project highlights some trade-offs between complexity and economic benefits. To meet the Clean Development Mechanism's standards for eligible carbon credit generation, the Humbo project had to put in place methods to enforce rules, monitor vegetation growth, distribute benefits, and communicate results. It had to demonstrate additionality and account for leakage. Demonstrating the additionality of the project, quantifying project leakage, and writing the 100-page project design according to the approved methodology required a significant amount of work (Rinaudo et al. 2008). And it had to engage many individual smallholders. These activities and related transaction costs have made the project relatively expensive and time-consuming (Rinaudo et al. 2008), and created a need to rely on external support, capacity, and finance (Tofu 2011). Scaling up such projects will require approaches that can reduce complexity and transaction costs, otherwise institutional capacity may not be adequate and the economic benefits of restoration to land managers may become outweighed by the costs. It is difficult to tell how sustainable the project will be without ongoing funding from external sources, particularly regarding external pressures from population growth.

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