

Table S1: Stated aims, current outcomes, and the unexpected effects of analyzed PES schemes.

PES name	Expected aims	Current outcomes	Unexpected results
1. Natural High Forest Rehabilitation Project on degraded land of Kibale National Park [38].	Reforestation in Kibale National Park, Uganda.	<ol style="list-style-type: none"> 1. 1.76 million trees were planted; 2. 1.2 million tons of CO₂ were sequestered; 3. 6,500 ha of natural forest were restored; 4. 140 permanent and 200 seasonal jobs were created; 5. Were strengthened by the diversity of the habitat: 13 species of primates, 4 wild cat species, 325 bird species, 60 other mammal species, and 350 tree species. 	<ol style="list-style-type: none"> 1. Influenced the Face the Future organization to implement an agroforestry pilot project in the vicinity of Kibale National Park. The initiative involved working with smallholder farmers to incorporate additional trees and perennials into their farms. 2. It was necessary to build a ditch at the edge of the forest to prevent the elephants from moving into the farmland.
2. Community Based Forest Management [47].	Ensuring people's participation in forestry and changing from collaborative forestry involving some form of communal ownership and collective action on government land, to community forestry practiced on village lands and small-scale forestry practices on private land.	<ol style="list-style-type: none"> 1. Clearly defined boundaries at Duru-Haitemba; 2. Improved relationships between allocation and service delivery (provision) rules and local conditions at Duru-Haitemba; 3. Good conflict resolution mechanism through village reconciliation committees; 4. Duru-Haitemba scheme is currently under the management of the 12 villages that surround it. 	The composition of village forest committees has constantly changed from village leaders to ordinary villagers.
3. KVTC [47].	Providing support to communities that have granted land to KVTC for its forestry and processing operations.	<ol style="list-style-type: none"> 1. Since 2003, 185,000 USD worth of projects have been funded in the 11 villages surrounding KVTC; 2. Farmers were supplied with seedlings and fertilizers; 3. Covered 50% of the cost of farm inputs. 	Loss of ecological diversity by planting teak trees on a large area of land.

<p>4. Arabuko Sokoke Forest Management and Conservation [48].</p>	<p>Improving livelihoods at Arabuko-Sokoke Forest in Kenya</p>	<ol style="list-style-type: none"> 1. Successful income-generating activities have been established: butterfly farming, beekeeping, mushroom farming, aloe cultivation, ecotourism, and agroforestry; 2. Kipepeo project had a sale of butterfly pupae between 1994 and 2005 exceed 750,000 USD; 3. Ecotourism and environmental education have been enhanced through the Arabuko–Sokoke Forest Guides Association; 4. Local people living next to the forest have built and manage 11 kilometers of pipelines that supply fresh water to their villages. 	<p>Honey has been particularly successful, and production still cannot keep up with local demand.</p>
<p>5. TGB Plan Vivo (PV) [56].</p>	<p>Implementing a carbon offset scheme that combines community-led activities to increase carbon sequestration, encourage sustainable land-use practices and provide farmers with performance-based payments.</p>	<ol style="list-style-type: none"> 1. Management practices mainly include planting of indigenous tree species such as <i>Measopsis eminii</i>, <i>Prunus africana</i>, <i>Warbugia Ugandensis</i>, <i>Khaya</i> Sp., etc.; 2. Over 2 million tons of CO₂ were sequestered according to last audit report of 2019; 3. More than 12,000 smallholder households have concluded PES agreements; 4. 26 commercials for nurseries. 	<p>TGB won the 2013 UN SEED Award for being an exceptional social and environmental low carbon enterprise.</p>
<p>6. Agricultural Productivity and Sustainable Land Management [42].</p>	<p>Addressing land degradation and improving land management in five watersheds – Cherangani Hills, Taita-Taveta, Tugen Hills, Kinale-Kikuyu, and Yala – to ensure continued ecosystem functions, sustain rural livelihoods and address significant global environment priorities.</p>	<ol style="list-style-type: none"> 1. Agroforestry promoted indigenous trees species; 2. Investment of 3.5 million USD in sustainable land management micro-projects and promotion of alternative livelihoods systems. 	<p>Women participated at a rate of 46%, this was unexpected due the customary laws of the rural area.</p>

7. Novel Forms of Livestock & Wild-life Integration Adjacent to Protected Areas in Africa [57].	Integrating biodiversity into landscapes and production sectors.	<ol style="list-style-type: none"> 1. Participatory land use plans and Wildlife Management Areas were developed, adopted, and implemented; 2. Three equitable partnerships between communities and private operators were established (Conservation Business Venture – CBV). 	The project indirectly fostered the intensification of livestock production by improving animal health and pastoral investment capacity through livelihood benefits.
8. Wildlife Conservation Leasing Demonstration [58].	Ensuring long-term ecological viability of Nairobi National Park by maintaining seasonal dispersal areas and migration corridors on adjacent privately owned lands and by demonstrating the use of wildlife conservation leases as a conservation tool outside PAs.	<ol style="list-style-type: none"> 1. The area of conserved land increase through wildlife conservation leases. The area voluntarily involved increased to 6,000 acres and the number of beneficiary households increased by 650; 2. Institutions were consolidated and information was disseminated. 	Political pressure to fence off the southern border of Nairobi National Park which could make the project irrelevant.
9. Developing Incentives for Community Participation in Forest Conservation through the Use of Commercial Insects in Kenya [41].	Demonstrating in three different forest sites that the biodiversity of Kenya’s forest PA system can be maintained through collaborative management systems using incentives based on income from commercial insects.	<ol style="list-style-type: none"> 1. Increased abundance of wild silk moth and pollinating bees. Forest-dependent bird species show no species loss and there is population abundance in core and buffer areas; 2. A total of 12,000 ha of forest and woodland in three separate Forest Reserves are under improved multi-stakeholder management; 3. Illegal cutting in the buffer zone was reduced by 50% until the final year; 4. Forest associations formed in the target villages; 5. Established and operational 30 apiaries (average 20 hives each), 20 silk moth rearing houses and 10 wild silk moth farming sites. 	Market incapacity to absorb silk and honey products resulting from project inputs. However, they established market linkages and the market intelligence service through IFAD grant.
10. Trees for global benefit program: Environmental	Implementing a market-based solution that reduces the unsustainable exploitation of	<ol style="list-style-type: none"> 1. A number of 3,321 small holder households concluded a PES agreement by 2021; 2. 4.1 million USD payouts to PES participants; 	Pest and diseases; <i>Maesopsis eminii</i> tree species continued to be

Conservation Trust (ECOTRUST) [36].	forest resources and the decline of ecosystem quality, while diversifying and increasing the incomes of rural farmers and their families.	3. PES systems were automated using Farm-Trace Platform.	affected, particularly in Kikuube district.
11. Equitable Payments for Watershed Services [47].	Promoting soil and water conservation practices (SWCP).	1. A two-million-liter water storage tank was built in the Mazizi area; 2. The intake area was repaired and two water treatment areas were build (Clarifier).	People engaged in activities such as fishing in Rufiji River.
12. Co-Management in national parks and Forest Reserves [52].	Allowing communities to enter the forest and extract non-timber forest products in exchange for border protection.	1. Kibale National Park has entered into eight agreements, involving 29% of surrounding parishes, with another 21 awaiting UWA approval; 2. UWA Revenue Sharing Programme has so far paid over 49.1 million USD directly to communities surrounding wildlife conservation areas (this represents 20% of all entrance fee collections). Another 54.7 million USD will be available on the next release.	Several applications have been received by NFA from local communities expressing interest to get involved in CFM activities.
13. SIP: Reducing Land Degradation on the Highlands of Kilimanjaro [59].	Creating a sustainable enabling environment for integrated sustainable land management that reduces land degradation and improves livelihoods in the Kilimanjaro Highlands, Tanzania.	1. SLM systems that improve tree cover, (the Chagga Home Garden System – CHG System), especially shade coffee, have been established in in four districts; 2. Increased forest vegetation cover: as forest plots are planted with economically ecologically useful species /mix of species, e.g., improved condition of fruit trees.	Local economies are slow to demonstrate the economic returns of SLM investments, thus promoting short-term survival decisions over investments in good practices with subsequent incomes by both land managers and their leaders.
14. Participatory Environmental Management [60].	Demonstrating effective and efficient strategies that support poor households in rural Tanzania	1. Supports the integration of adaptation strategies into district development plans as well as village land use plans for five villages;	The project further supports the integration of climate change adaptation through teaching in four

	to adapt to the negative impacts of climate change and to alleviate poverty.	2. Provided support for the development of forest-based enterprises, including eco-tourism, butterfly farming and beekeeping.	primary schools and one secondary school.
15. Nile Basin [16].	Provide a new financing mechanism to overcome current barriers to establishing timber plantations in Uganda and to allow communities to benefit from the CDM.	<ol style="list-style-type: none"> 53,694 tons of CO₂ were sequestered according to the monitoring report of 30/05/2018; The stocked area by end of 2017 was 93.83, with 81.73 ha belonging to the NFA, and 12.10 ha to the community group. 	First African forestry project to be registered under the CDM in August 2009.
16. Community Based Forest Management [47].	Ensuring people`s participation in forestry and changing from collaborative forestry involving some form of communal ownership and collective action on government land, to community forestry practiced on village lands and small-scale forestry practices on private land.	<ol style="list-style-type: none"> All community forest groups have been FSC certified, the earliest in 2009 and the latest in 2017; Mpingo Conservation and Development Initiative (MCDI) was established to promote and facilitate sustainable forest use through CBFM in southeastern Tanzania. 	Deforestation and degradation are simply pushed onto other unprotected land.
17. Joint Forest Management (JFM) [47].	Supporting communities and the Government to collaborate for the management of forest reserves.	<ol style="list-style-type: none"> Joint patrols have successfully addressed illegal harvesting and deforestation in the two reserves; The legal status of the Mkingu Forest was upgraded from Forest Reserve to Nature Reserve and a management plan was developed and approved. 	The absence of a compensation system for community members participating in PA management, especially in low-income forest such as Mkingu and Kanga. This lack of a mechanism poses a threat to the long-term sustainability and equity of JFM in these forests.
18. Sustaining Agriculture through Climate Change	Focusing on tree planting intervention.	<ol style="list-style-type: none"> 71,000 ha of trees were planted; 865,248 tons of CO₂ calculated to be sequestered by 2025. 	The contracts will include the names of female and male heads of household, and decisions and

(SACC): CARE International [61].			payments would require the authorization of both.
19. The Namwasa Forestation Project [16].	Planting of fast-growing trees (eucalyptus and pine) for harvest and sale as poles and round logs. The project aimed to generate environmental and social benefits.	<ol style="list-style-type: none"> 1.2 million tons of CO₂ calculated to be sequestered by 2023; By 2010, 6,544 ha of trees were planted. 	<ol style="list-style-type: none"> Ugandan police and army evicted residents from the Namwasa Reserve. Loss of property and farmland and one death was reported in 2010; The residents were evicted, but legal action remains unresolved.
20. The international small group tree planting program (TIST) [51].	Empowering small groups of subsistence farmers in Kenya to reverse the devastating effects of deforestation, drought, and famine.	<ol style="list-style-type: none"> 4,597 ha of land were reforested; 740,608 tons of CO₂ were sequestered during monitoring period – 23.5.2020 to 14.4.2023. 6,215,422 seedlings are growing and being monitored; Over 12.7 million trees are growing and being monitored. 	Every farmer in the TIST program has been trained to help avoid double counting in the carbon business.
21. Vi Agroforestry: Western Kenya Smallholder Agriculture Carbon Finance Project [62].	<ol style="list-style-type: none"> Adoption of sustainable agricultural land management (SALM) by landholders and farmers; Producing verifiable carbon credits. 	<ol style="list-style-type: none"> The annual income from the production of carbon credits is 247,272 USD; Participating farmers practice diversified activities and adopted the use of compost, terracing, agroforestry, nutrient management, soil and water conservation techniques; Farmers practice mulching on their beans to allow moisture to be retained and the soil to receive nutrients. The farms have several types of trees, including grevillea, mango, and avocado. 	Additionality refers to sequestering carbon only with the help of carbon financing. In this PES scheme, the non-carbon financing barriers include partial financing for extension services and a technology barrier for implementing a climate performance monitoring system. The monitoring system is crucial for effective project implementation.
22. From payment to co-investment for ecosystem services: Stewardship and	Conservation of agricultural activities under PES contractual agreement.	<ol style="list-style-type: none"> Farms were enriched as a result of the use of indigenous trees and agroforestry practices by planting trees for fruit and timber: gross 	Displacement of degradation practices in the neighboring area of Kabati, Kenya.

<p>livelihood improvement in the Lake Naivasha agro-production landscape [43].</p>		<p>monthly crop income increased from 37 USD to 61 USD in 2008;</p> <ol style="list-style-type: none"> 2. Practicing conservation agriculture led 98% of PES participants to perceive an improvement in crop productivity; 3. The improvement in water quality was felt by 84% of the participants; 4. As a result of the reduction of siltation on agricultural land and riverbanks, 70% of participants felt that there had been an improvement. 	
<p>23. Wildlife Works [47].</p>	<p>With access to the global carbon market, to empower the local community in the Kasigau Corridor region in southeastern Kenya with long-term employment that replaces unsustainable sources of income such as poaching, subsistence agriculture and illegal tree harvesting.</p>	<ol style="list-style-type: none"> 1. Eight permanent employees manually process 850-1,274 0.5 kg briquettes/week; 2. Carbon revenues have funded the completion of 31 water projects facilitating access to water for over 50,000 people. 	<p>The Kasigau Corridor REDD+ project has been awarded gold level status by the Community and Biodiversity Standard for exceptional biodiversity and climate benefits.</p>
<p>24. Strengthening the Protected Area Network within the Eastern Montane Forest Hotspot of Kenya [45].</p>	<p>Ensuring adequate representation and management of the biodiversity of the Eastern Montane Forest within the Kenyan PA network.</p>	<ol style="list-style-type: none"> 1. New PAs were established: 20,000 ha; threatened forest reserves were reclassified to a higher management category: National Reserve (20,000 ha)/Nature Reserve (25,000 ha); 2. Forest loss in small, unprotected forest blocks has been reduced; 3. The ecological integrity of the Mau Forest Complex has been restored - 10,000 ha of degraded land is under assisted regeneration and 10,000 ha of converted forest land has been planted with indigenous tree species. 	<ol style="list-style-type: none"> 1. Land pressure and those looking for short-term gains reduce attempts at rational conservation at the landscape level; 2. Significant increases in external pressure on forest protected areas, leading to increased forest loss and fragmentation.

<p>25. Reforesting landscapes for biodiversity (Amboseli) [63].</p>	<ol style="list-style-type: none"> 1. Improving the sustainability of PA. 2. Integrating conservation and sustainable use of biodiversity into production landscapes. 	<ol style="list-style-type: none"> 1. Amboseli Conservation Academy (ACA) established focus on security training; 2. The 4,550 km² buffer zones of the core parks were subject to a systematic management framework; 3. Management plans for general rural land use and grazing have been developed. 	<p>Movement of elephant populations within the Amboseli landscape and between the three core PAs has increased.</p>
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