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# ZEF

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Economics of land degradation and improvement  
in Niger

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# MAIN FINDINGS

1. The Nigerien human development index (HDI)<sup>1</sup> has increased by about 88% from 0.18 in 1980 to 0.33 in 2013. The corresponding HDI increase in sub-Saharan Africa in the same period was only 37%. Major drivers of the Nigerien development were pro-poor natural resource management policies and institutional changes that incentivized land users to adopt sustainable land management practices.
2. Despite this remarkable development, Niger experienced severe land degradation in the period of 2001-2009. About six million hectares or 19% of the land area (excluding desert) experienced land degradation due to land use and land cover change (LUCC) – in which a low value biome replaces a high value biome. The cost of land degradation due to LUCC was about 0.75 billion USD, which is 11% of the 2007 Nigerien GDP of 6.773 billion USD.
3. Grazing lands also experienced severe degradation due to overgrazing and poor pasture management. Only about 4% of the farmers used improved pasture management. Degradation of grazing lands affects almost all households, as 97% of households in Niger keep livestock. The on-farm and off-farm cost of grazing degradation is about 843.33 million USD or 12% of the country's GDP. Degradation of grazing lands is costlier given that livestock provide manure and draft power, serve as store of wealth, and play other social-cultural roles.
4. Land degradation on cropland is also high. Yield of millet – accounting for 44% of the total cropland - is only 50% of the potential yield. There is an inverse relationship between adoption rate and profitability of soil fertility management practices. The unexpected pattern is due to poor access to markets, limited agricultural advisory and other rural services. The annual on-farm and off-farm cost of land degradation on cropland is about 426.5 million USD or 4% of the country's GDP.
5. The total cost of land degradation due to LUCC and use of land degrading management practices on grazing and cropland that did not experience LUCC is about 2 billion USD – or about 30% of the Nigerien GDP. This underscores the high cost of inaction against land degradation.
6. There is strong justification for taking action against land degradation since every US dollar invested in restoration of degraded lands gives back six US dollars. Niger has taken bold steps in designing better policies after past policies led to severe land degradation. Its successful restoration of degraded lands and consequent improvement of human development demonstrate that severely degraded lands should not be abandoned but rather regarded as low-hanging fruits for taking action against land degradation.
7. The Nigerien success story demonstrates that even poor countries can implement policies to restore degraded lands.

<sup>1</sup> HDI means human development index computed using life expectancy, education, and per capita income of a country. HDI ranges from 0 to 1, with HDI=1 being the highest level of development and 0 as the lowest level



## Introduction

Niger's natural resource management policies and institutions in colonial and post-independence times have discouraged land owners to plant or protect trees. The consequent land clearing led to severe scarcity of tree products. Firewood collection – mainly done by women – became a full-time task, especially after the prolonged drought period. Niger learnt a hard lesson and finally designed policies and institutions that provided incentives for sustainable land management practices. Significant land restoration occurred and as the majority of Niger's people depend heavily on natural resources, improving land led to improving their welfare.

## The sun is rising in Niger

Changes in natural resources policies and statues in 1990s-2005 led to a significant improvement of government effectiveness (GE) (the quality of provision of public and civil services policy formulation and implementation, their independence from political pressures, and the credibility of the government's commitment to its stated policies) (Kaufmann et al 2010). Whereas the GE index rose from -1.24 in 1996 to -0.70 in 2012 (a rise of 43%), the corresponding GE index for sub-Saharan and Western Africa deteriorated during the same period. The Nigerien human development index (HDI) increased by about 88% from 0.18 in 1980 to 0.33 in 2013. The corresponding increase during the same period for sub-Saharan Africa was only 37%. The share of the population in Niger with malnutrition in 2012-14 fell by about 60% compared to its level in 1990-92, whereas the corresponding change in Western Africa was 43% and 25% in sub-Saharan. Even though there may be no direct connection between improving

human development indicators and the government's policies and institutional changes, the strong correlation suggests a causal relationship.

## Extent and cost of land degradation

Despite these remarkable developments, Niger faces daunting challenges regarding land degradation (defined as a long-term loss of ecosystem services). Land use and land cover change, where a low-value biome replaces a high value biome, is the major type of land degradation in Niger. Between 2001-09, 6.12 million ha or 19% of Niger's land area – excluding desert – experienced LUCC. Cropland expansion accounted for about 57% of deforestation, followed by grassland expansion. However, 90% of cropland expanded into grasslands. One of the major reasons is low livestock productivity, making production of livestock less competitive than crops. Cost of land degradation due to LUCC is about 2007 0.75 billion USD, which is 11% of the 2007 GDP.

## Land degradation on grazing lands

Only 3.6% of households in Niger use pasture improvement management practices. Milk yield per cow on ordinary grazing land is 25% lower than from cows grazing on lands undergone improved pasture management. The on-farm and off-farm cost of grazing degradation is about 843.33 USD or 12% of the country's GDP. Degradation of grazing lands is costlier given that livestock also provides other ecosystem services.

## Degradation on croplands

Analysis of the adoption rate and profitability of soil fertility management practices showed an inverse relationship. Using results from millet, maize and rice (45% of cropland area), the on-farm and off-farm (mainly



loss of carbon sequestration) cost of cropland degradation is 427 million USD or about 4% of the country's GDP.

### Taking action against land degradation

Although a land user gets back 6 USD for every dollar invested in restoration of degraded land in Niger, land users and the government do not invest much. The Nigerien government spends only 12.7% of its public budget on agriculture (Benin et al 2012). Though this exceeds the 10% target set in the Maputo Declaration (AU, 2003), more investment is needed to enhance productivity and address a host of other factors limiting productivity. As private land investment is low, we looked into the challenges hampering farmers from adopting these profitable land management practices.

### Drivers for Sustainable Land Management and risk reduction practices

Major drivers of adoption of sustainable land management practices are: access to markets, family labor (enhancing adoption of organic inputs), ownership of livestock (increasing adoption of soil fertility management practices since livestock produces manure and draft power to transport it to crop plots). Plots closer to home are likely to receive both organic inputs and inorganic fertilizer. Crop rotation, stone bunds, and demi-lunes are risk-reducing land management practices. Non-farm activities increase the propensity to use purchased inputs. This shows the synergistic relationship between non-farm and farm activities. The number of female household members, customary land tenure, and proximity of plot to home also reduce production risks. The results further underscore the importance of non-

farm activities and the role that female household members play in enhancing resilience of households to shocks.

### Conclusions

Niger has successfully demonstrated that policies and institutions can effectively provide incentives for poor land users to invest in sustainable land management practices and to restore highly degraded lands. Improvement of access to rural services and facilitation of non-farm activities will lead to faster and greater impacts of adoption of Sustainable Land Management practices and increase resilience to agricultural production shocks in Niger. As Niger continues to improve Sustainable Land Management, it faces daunting challenges to alleviate the high cost of land degradation. Both the national and international communities can learn from the achievements of Niger and help land users to sustainably manage their natural resources.

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