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Policies for sustainable land management in the highlands of Ethiopia

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Development paths and policies for sustainable land management in Andit Tid, North Shewa: An exploration

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Introduction

Andit Tid may be described as an area with low agricultural potential, good market access and high population density. The high population pressure on the steep terrain has led to severe land degradation. We study the changes that have taken place over the last 15 years and look for policies that may be used to create incentives for more sustainable land use.

Our objectives are to:

- analyse the current situation and recent trends in land use and household welfare in the study area
- assess key constraints to sustainable land management in the area
- present alternative policy options for discussion on how best to promote more sustainable land use and improve the welfare of farm households in Andit Tid and the Ethiopian highlands in general.

Andit Tid is located in North Shewa along the highway linking Tigray to central Ethiopia. It is a high altitude area (>3000 m above sea level). The land is located in two altitude zones: the *dega* zone (<3200 m above sea level) and the *wurch* zone (>3200 m above sea level). Most crop production takes place in the *dega* zone but barley is also grown in the *wurch* zone in the *belg* season (January to May). The two dominant soil types are Andosols and Regosols. Andosols dominate in the *wurch* zone while Regosols dominate in the *dega* zone. Andosols are rich in organic matter. The grass turf is collected in heaps and burnt¹ before planting of barley. This releases nutrients for the crop but also causes considerable losses of organic matter and soil nitrogen. One estimate suggests that 75% of the land is on steep slopes (gradients >25%).

The main crop in the area is barley, followed by wheat, horse bean and field pea. Lentils and linseeds are also commonly grown. The average rainfall is 1336 mm/year distributed over two growing seasons. Droughts have not been common in the area until very recently when the *belg* rains have failed in three consecutive years. Hailstorms and frost have, however, commonly damaged crops. The farming system is a typical crop-livestock system where crop residues are used as animal fodder and animal manure is used for fuel or as manure on crops.

1. Locally called *guay*.

Development pathway 1980–2000

Changes in key variables are summarised in Table 1.

Table 1. Changes in Andit Tid 1986–99.

Variable	1986	1999
Average farm size	3.77 hectares (ha)	2.16 ha
Average household size	5.04	5.67
Average oxen holding	1.54	1.2
Average number of cows	1.18	0.8
Average number of sheep	6.25	5.3
Cereal production	Net sellers	Net buyers
Tropical livestock units/ha	1.48	1.71

We see a considerable decline in farm size, an increase in average household size and a decrease in livestock numbers per household but an overall increase in livestock population pressure. Only 5% of the fodder was obtained from communal land while 16% was purchased, making the farm itself the major source of animal fodder. A population growth of about 3% per year has contributed to the increasing land pressure that has caused an increase in cultivated area and reduction of fallow land area. Two per cent of the land has degraded to bad land over two decades. Degraded land is used for grazing and tree planting. Crop yields have declined significantly. The recent droughts have caused an acute food insecurity problem and have converted the area to dependency on food aid. One-third of the cereals consumed in 1999 were received as food aid.

Key constraints to sustainable land management (SLM)

- **Missing information:** Is lack of awareness about the problem or about solutions an important constraint?
 - Lack of awareness is probably not the problem due to the presence of the Soil Conservation Research Programme (SCRIP) since the early 1980s.
 - The technical solutions provided to farmers appear to have been unattractive.
- **Technology:** Do technological solutions exist and do they pay?
 - More sustainable technologies exist; but
 - Conservation technologies are unprofitable, fertiliser use is risky, eucalyptus is profitable but appears to have a limited market; and
 - More research on technology options is required, emphasis should be given to fodder for improved livestock production and horticultural crops, and the potential complementary effects of combining fertilisers and conservation technologies.

- **Tenure insecurity: Is tenure insecurity reducing investment in conservation?**
 - The 1997 land redistribution may have caused a reduction in number of households planting trees.
 - Other constraints appear more important than tenure insecurity as constraints to SLM in Andit Tid.
- **Resource poverty: Are people too poor to conserve their resources?**
 - Land scarcity appears to create incentives for farmers to remove conservation structures, to increase cultivable farm size and to increase production in the short-run.
 - Poverty causes high discount rates and reduces incentives to invest in conservation.
- **Market imperfections: Do they prevent adoption of SLM and cause non-sustainable land use?**
 - Imperfections in rental markets for land and oxen in Andit Tid appear to cause overstocking of oxen.
 - Access to credit appears not to constrain fertiliser use; rather production risk and high fertiliser prices are limiting its use.
- **Policy failures: Have the past top-down policies undermined local participation and collective action and caused conservation technologies to be rejected?**
 - Top-down implementation and choice of technology may be an important reason for rejection or removal of conservation structures in Andit Tid.
 - It is uncertain whether a participatory approach would have been much more successful if it were to rely on the same technologies.

Policy options

- **Extension service: new roles:** Could the extension service become more active in promoting SLM, stimulate collective action and improve the functioning of local markets?
- **New technologies:** More adaptive research is needed for high elevation areas like Andit Tid. The station should be used to test out new technologies, especially the potential of integrating conservation technologies and productivity increasing technologies.
- **Top-down policies vs. local collective action:** Assessment should be made of what the local people are able to do themselves with their own resources, what they can do with some assistance from the outside and what they are unable to do and need more assistance for.
- **Land tenure policies:** Tenure security appears to be a necessary but insufficient instrument to promote SLM.
- **Credit and input supply:** Care must be taken so that provision of credit and fertiliser does not become a substitute for conservation.

- **Pigouvian taxes and subsidies:** Taxes and subsidies may be used to internalise environmental externalities (e.g. land degradation). Taxes and subsidies may be used on inputs as well as outputs. Careful analysis is required to do this properly.
- **Interlinkage of policies, markets and technologies:** Interlinked ('package') approaches may be used to reduce transaction costs, address simultaneously several constraints and improve targeting of policies. This is a knowledge demanding approach that must be fit to the local circumstances. Local participation and commitment is required for such policies to work. Examples:
 - Linking (subsidised) input and credit supply to conservation requirements.
 - Use food-for-work for conservation investment.
 - Labour taxation (mobilisation) for conservation investments.
 - Tenure security linked to conservation requirements.
 - Collective action to improve local markets.

Conclusions

Andit Tid has followed a Neo-Malthusian development path in the period 1980–2000. Reliance on market forces alone is insufficient to achieve SLM in this highly degraded area. Policies that attack the multiple constraints to SLM are required. Local participation is crucial for proper design, implementation, monitoring and enforcement of such policies.