Promoting global watershed management towards rural communities: The May Zeg-zeg initiative

J. Nyssen,[1,2] Mitiku Haile,[1] K. Descheemaeker,[3] J. Deckers,[3] J. Poesen,[2] J. Moeyersons[4] and Trufat Hailemariam[5]*

1. Department of Land Resources Management and Environmental Protection, Mekelle University, Mekelle, Ethiopia
2. Laboratory for Experimental Geomorphology, K.U. Leuven, Redingenstraat 16, B-3000 Leuven, Belgium
3. Institute for Land and Water Management, K.U. Leuven, Vital Decosterstraat 102, B-3000 Leuven, Belgium
4. Royal Museum for Central Africa, B-3080 Tervuren, Belgium
5. Department of Applied Geology, Mekelle University, Mekelle, Ethiopia
* Corresponding author

Abstract

To fight land degradation, the regional government of Tigray (which is the northernmost and driest region of the Ethiopian highlands) has initiated many conservation programmes, i.e. massive introduction of stone bunds to reduce runoff, check dams in gullies and cattle exclosures on steep slopes (Gaspart et al. 1997; Kebrom et al. 1997; Bosshart 1998; Nyssen 1998; Berhanu et al. 1999; Herweg and Ludi 1999; Vagen et al. 1999; Nyssen et al. 2000a; Nyssen et al. 2000b; Nyssen et al. 2001).

In 1998, a research project on 'Desertification and anthropogenic erosion processes in a tropical mountain catchment: Tigray, Ethiopia' was initiated in the region to address fundamental research questions linked to land and water management. In the course of this project, it became clear that a given conservation technique was successful in some areas, but failed completely in others. For instance, gully check dams are successful at some sites, but fail completely in other pedo-topographic conditions. For these reasons, in 2001 an applied participatory research programme on watershed management (Zala-Daget project) has been set up in the Dogu'a Tembien District.

A broad scientific base has thus been constituted on problems of watershed management in this district; local authorities and farmers would like this knowledge to be used for watershed management in co-operation with the local Agricultural Office and administration at different levels. The farmers of the district are very active participants in soil and water conservation activities, and many of them involved in the previous and current research projects.

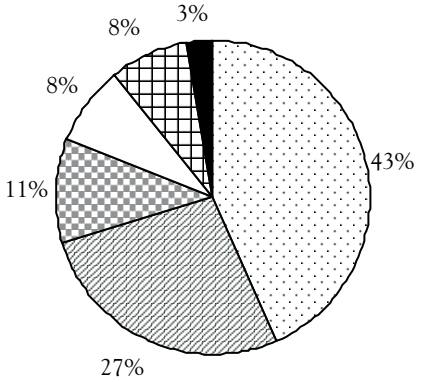
Researchers involved in the projects hope to be able to start a new project, called 'The integrated May Zeg-zeg watershed management initiative'. This project aims at

demonstrating and promoting global watershed management towards rural communities in the highlands of northern Ethiopia.

To achieve this objective two initiatives will be taken:

1. installation of a sustainably managed demonstration catchment of 400 ha and
2. elaboration of a capacity building and awareness raising programme regarding integrated watershed management.

Even if rainfall conditions in the Ethiopian highlands improved, drought and famine remain due to the erratic nature of rainfall and the low infiltration capacity of the soil (Conway 2000). A recent study shows that 54% of the farmers in the village of Hechi, in the lower part of the project catchment consider water availability as their main problem (Figure 1) (Naudts 2002). Another major issue for the farmers, fodder production, will also be directly addressed by the project, through the agroforestry component.



Source: After Naudts (2002).

Figure1. *Answers to the question 'Which is the main problem for the farmers in your village?', in Hechi (n = 37).*

Although there have been many initiatives for water conservation in Tigray (implementation of exclosures and stone bunds at a large scale, agroforestry trials), until now these techniques were never brought together and managed in a complete catchment, thus demonstrating the advantages brought by integrated watershed management. Furthermore, another innovative aspect of the project is that it includes an important, but realistic, change in land use: abandonment of free grazing system and change to no or controlled grazing.

Taking into account the broad scientific knowledge on which the May Zeg-zeg initiative is based, and the longstanding co-operation between the community and the different partners, we feel sure that this initiative will be successful with the installation of a sustainably managed demonstration catchment, which will serve for a capacity building and awareness raising programme regarding integrated watershed management.

Acknowledgements

This paper benefited a lot from input by numerous farmers of the study area, from Berhanu G/Medhin (Research Assistant at the International Livestock Research Institute, ILRI), local authorities of Mikael Awhi, Ayni Birkekn, Hagere Selam *tabias* and Dogu'a Tembien *woreda*, staff of Dogu'a Tembien Agricultural and REST (Relief Society of Tigray) offices, and from fellow researchers (Jef Naudts, Helga Vandenreyken, Nigussie Haregeweyn and Desta Gebremichael).

References

Berhanu Gebremedhin, Swinton S. and Yibabe Tilahun. 1999. Effects of stone terraces on crop yields and farm profitability: Results of on-farm research in Tigray, northern Ethiopia. *Journal of Soil and Water Conservation* 54(3):568–573.

Bosshart U. 1998. Catchment discharge and suspended sediment transport as indicators of the performance of physical soil and water conservation in Ethiopian highlands. *Advances in GeoEcology* 31:403–413.

Conway D. 2000. Some aspects of climate variability in the North-East Ethiopian highlands—Wollo and Tigray. Sinet: *Ethiopian Journal of Science* 23(2):139–161.

Gaspart F., Jabbar M., Mélard C. and Platteau J.-Ph. 1997. Participation in the construction of a local public good: A case study of watershed management in the Ethiopian highlands. Cahiers de la Faculté des Sciences économiques, sociales et de gestion de Namur, Série Recherche. 181, 23 pp.

Herweg K. and Ludi E. 1999. The performance of selected soil and water conservation measures—Case studies from Ethiopia and Eritrea. *Catena* 36(1–2):99–114.

Kebrom Tekle, Backeus I., Skoglund J. and Zerihun Woldu. 1997. Vegetation on hillslopes in southern Wello, Ethiopia: Degradation and regeneration. *Nordic Journal of Botany* 17(5):483–493.

Naudts J. 2002. Les Hautes Terres de Tembien, Tigré, Ethiopie; Dislocation et persistance d'une ancienne civilisation agraire; Conséquences sur la dégradation des terres. Mémoire présenté en vue de l'obtention du Diplôme d'Agronomie Tropicale. CNEARC, Montpellier, France. 147 pp.

Nyssen J. 1998. Soil and water conservation under changing socio-economic conditions in the Tembien highlands (Tigray, Ethiopia). *Bull. de la Société géographique de Liège* 35:5–17.

Nyssen J., Mitiku Haile, Moeyersons J., Poesen J. and Deckers J. 2000a. Soil and water conservation in Tigray (northern Ethiopia): The traditional daget technique and its integration with introduced techniques. *Land Degradation and Development* 11(3):199–208.

Nyssen J., Poesen J., Mitiku Haile, Moeyersons J. and Deckers J. 2000b. Tillage erosion on slopes with soil conservation structures in the Ethiopian highlands. *Soil and Tillage Research* 57(3):115–127.

Nyssen J., Mitiku Haile, Poesen J., Deckers J. and Moeyersons J. 2001. Removal of rock fragments and its effect on soil loss and crop yield, Tigray, Ethiopia. *Soil Use and Management* 17:179–187.

Vagen T.G., Yibabe Tilahun and Esser K. 1999. Effects of stone terracing on available phosphorus and yields on highly eroded slopes in Tigray, Ethiopia. *Journal of Sustainable Agriculture* 15(1):61–74.