

The Myth of Agroecology – Examples from Uganda



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Introduction

- Not only in the Northern Hemisphere, but also in the South, there is a hype on agroecology, however, what's behind this term when we look into practice?
- Therefore, our interest was to understand how far agroecological practices (AEP) are applied, and if, in which quality and quantity.

Methods

Twenty farms have been analyzed which claim to apply agroecological methods. Farm sizes range between 1 and 70 ha in the mainly mountainous and slopy Rwenzori region of Western Uganda. The assessment builds on an approximate estimation of the quantity as well as the quality of AEP, using a key with: very high=5; high=4; medium=3; low=2; very low=1... quality / quantity. Background information was collected via qualitative interviews, field and stable walks, as well as farm observations. Due to the variation of values, we decided to describe the main findings with a qualitative approach (Table 1). A following publication with approx. 30 farms as a reference will include a quantification of all farm results, as well as a classification of agroecological practices, and of farming systems with different agroecological approaches.

Farm characteristics

- Annual rainfall is up to 1.500 mm, average temperature beyond 20°C, while soils vary between sandy, skeleton rich and more clayey soils.
- Farms are diverse and include in the arable production mainly maize, potato, sweet potato, cereals, and grain legumes.
- Coffea, tea, banana and pastures for animals are further cultivated, as well as single trees and hedges.
- All kind of animal husbandry are part of the farms, which mainly consist of sheep, chicken, some cattle (dairy cows and oxen) and goats.
- Mechanization level is mainly low or does not exist.

Conclusions



AEP are still an exception than mainstream practice. As a consequence, irreversible loss of land via soil erosion and landslides continue to be high, biodiversity loss is on the rise and farms contribute to climate change, while not being prepared against it.

- Where AEPs are successfully implemented, profound knowledge and long-term experience, technical competences and, in the case of smallholders, group driven exchange and activities on practices, as well as well-developed access to markets are the success factors. Resetting research, educational and advisory services, and demo-farms with convincing applications of AER are part of successful adoption and diffusion of AEP. Governmental commitment and advertisement for AEP are seen as another precondition for their successful implementation.
- In the communication with the agricultural community the diverse farming methods as mentioned in the discussion need to be deconstructed. There is need for a clear message that at the end its simply about, e.g., "crop rotation, animal manure, soil cover, alley cropping and biomass production". All kind of terminology that is confusing for farmers should be removed from the discussion. It's not about highlighting one or the other AEP, however, to apply all AEP systematically with a high quality and quantity. Otherwise, the impact of a single method is rather low and does not contribute to any sustainable transformation of farming systems to successfully address the current mainly human driven challenges.



Pic 3. Above left: Slopy area with coffee, without trees and cover crops; Pic 4. Below left: coffee with Grevillea, and permanent ground cover (both: R. Klepsch); Pic 5. Above right: Sheep keeping with high fertilizer loss; Pic 6. Below right: onion planting without erosion control (both B. Freyer)

Pic 1. Left: Natural vegetation in the National Park; right: Eroded slopy farmland (R. Klepsch)

Discussion

- Findings inform that AEP distribution in farms is (still) limited in quality and quantity. The practices that have been assessed are all not new, however, researched and recommended for decades, but may be not prioritized by all advisory services or not consequently advised, and lack of governmental strategies / policies.
- It can be excluded that AEP are not known by the advisory services in the region due to the fact that there are several Ugandan services and international NGOs knowledgeable of these practices. All practices are known for decades within the context of various farming methods, e.g., regenerative or evergreen agriculture, conservation tillage, climate smart agriculture, low external input or organic farming.
- A key weakness is the low investment into alley cropping / agroforestry or undersown crops in coffee, due to the fact that there is a shortage of biomass as basic material for feeding cows / producing animal manure, or as mulch material to hinder soil erosion in the mainly slopy Rwenzori region.
- However, with more than 1.000 mm rainfall per year, the potential to produce biomass is high even under conditions with sandy or clay soils.
- What can be observed in many farms is an underuse of land, visible in the amount of fallow land, or low share of alley cropping, hedges or tree rows along pathways, where a competition with the main crops can be excluded.
- In some cases, farmyard manure is misused for house construction or cooking, which could be easily replaced by wood as the climatic conditions allow a high production in a relatively short time.
- Crop rotation is misunderstood as it is not a system of three or four crops, but a complex sequence of several crops as discussed in organic farming. These observations can also be confirmed when visiting demonstration farms from advisory services or local research stations.

Results		
Agroecological practices	Assessment	
	Quality	Quantity
Plant hased		
Diverse crop rotation	Often critical is the seed density, due to a lack of adequate equipment, as well as selection of best seed quality, crop rotation rules are not known	Crop rotations are not differentiated, mostly dominated by maize, sometimes with maximum five crops in best cases; forage legumes are missing
Inter- and mixed cropping	If established, mostly only one crop species	Rarely established
Predator supportive structures	If established, rather by default; functionality not known	Rarely established
Woodlot local trees	If established, mostly only one tree species	Rarely established
Woodlot Eucalyptus	Established as a monocrop; neither critical impact nor alternative species known	Often established
Agroforestry Coffee (C)/Banana (B)	Rarely systematically established	Here and there established
Agroforestry C/B+trees	Additional tree species are an exception	Rarely established
Alley cropping	If established, then mainly only one tree species	Rarely established
Hedges	If established, species diversity rather by default than	Often in some parts established, but rarely as an overall
Soil cover	systematically If established, an equal distribution of mulch biomass is rare	systematic approach If practiced, then the amount of biomass applied is far too low (mulch from alleys, green manure from intercropping or kitchen compost)
Others		
Pasture management	There is no farm with a pasture management	
Bee keeping	Some farms with bee keeping; most of them with the traditional beehives; specific planting of species to increase honey production does not exist	Farms with a high share of beehives are an exception
Technical		
Weed control by hand hoe	There seems to be a lack of knowledge on the need of early weed control and the impact of crop rotation and mulching, or limited labor hinders an adapted management of weeds	
Weed control chopping / mulching	In most cases weeds are separated and does not function as mulch material	
Pathway system	Pathway systems are not sensitive to erosion activities	
Trench systems	Only in some cases the trench system is in an optimal shape, not becoming itself a driver of erosion or land slides due to a lack of plant stabilisation	In many farms established, however not in all fields
Terracing	Partly established according to best practices	In many farms not sufficiently established
	Input internal	
pH regulation internal**	Farmers are not aware of the potential of pH regulation specifically via animal manure	Rarely established
Animal manure collection	Often the manure is not protected against leaching	Only in some farms established, but due to low quality the amount of nutrient recycling is limited in the majority of farms
Bioslurry collection (slurry and biogas plant slurry)	If done, storage quality and distribution is low	In the majority of farms very limited
Biochar production and application		Practically not established
Plant compost	Management to secure good compost quality is rare	If established, low amounts of biomass
Kitchen compost	Management to secure good compost quality is rare	If established, low amounts of biomass
Biopesticides and mechanical control	Input external There are some biopesticides applied with low technological support	Practically not established
pH regulation external*		Practically not established

Main reasons for the low implementation and quality of AER practices are:

Material-technical:

- Lack of seed material and if, then only one or max. two varieties are available at the market
- Lack of adequate lime in the region

Socio-economic:

- Lack of finances for specific inputs and / or labor
- Lack of input services with the adequate product to support AE farming
- Limited potential for selling diverse crops

Social and educational:

- Limited experiences by the farmers, i.e., lack of best practices
- Cultural hurdles that hinder transformation processes
- Limited communication of AEP research, or research not related to AEP
- Lack of adequate advisory services and training

Table 1. Summary of main findings on the implementation of agroecological practices of farms in the Rwenzori region * liming; ** alley crops, organic manure (animal and compost); *** if not part of the farm