

Implementation, Monitoring and Management of a Pilot Rehabilitation Measure on Degraded Sloped Pastures in Brazil

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Study Area

Geo-ecological susceptibility to land degradation

- Weathered/eroded soils such as Ferralsols, Acrisols, Cambisols
- Hilly to steep relief,
- Seasonally pronounced precipitation and droughts
- High surface runoff, low water infiltration

Inappropriate pasture management

- Deforestation and land use change
- Pasture farming as dominant land use (>50% of agric. land)
- Overstocking
- Overgrazing
- Soil compaction
- Cattle trails as initial forms for erosion

Implementation

Time and costs for implementation (implementation start: June 2015)

Work time: 0 to 1200 h

Labor costs: 0 to 1200 h

Material costs: 0 to 1200 h

Total costs¹: 0 to 1200 h

Actual costs²: 0 to 1200 h

¹ All costs included

² Considering some gratis/donated duties by use of local/regional resources, tools and infrastructure (plant seedlings, micro-tractor rent, bamboo-stacks for palisades, ox-team for ploughing, material delivery) – costs for implemented PRM in Itaocara

Recommended n° of workers

Hedge terrace design

Planting scheme: 5 saplings/m

Goals

Fostering

- Erosion control
- Pasture recovery
- Pasture productivity
- Ecosystem services

Through

- Breaking the erosive power of water (runoff, interflow)
- Closing vegetation cover
- Parcelling for rotational farming or other future land use options
- Considering farmer concerns & best practices

Management plan

month	Rainy summer (RS)						Dry winter (DW)					
	1	2	3	4	5	6	7	8	9	10	11	12
Cattle rotation between GL	1	2	3	4	5	6	7	8	9	10	11	12
Maintenance cut hedgerows												
Shrub removal on grazing lots												
Ox-ploughing along contours												
Soil pH correction												
Dung-stonepowder fertilization												
Grass seeding												
Fence/gate check & repairs												
Palisade check and repairs												

GL...Grazing lot * Natural seeding ** Only in areas of high soil compaction or low grass cover

Recommended max. cattle stock density (AU/ha):	RS	DW
Unmanaged pasture on slope	2	2
Extensive rotational cattle farming on slope	9	3
Intensive rotational cattle farming in valley (irrigated)	13	13

AU...Animal Unit (~500kg)

Management

Grass-cover performance

Grass-type: *Brachiaria brizantha*

Saplings performance according to species and slope position: Mortality

Low mortality at all terraces - slow growth
+ Dense, shrubby, spiny, legume
+ Robust against pests

Additionally recorded pasture features:

- Spontaneous vegetation on 3 permanent parcels (10x20m) and 6 temporary parcels (10x10m)
- Soil properties along transect
- Near surface temperature and relative humidity along transect
- Erosion forms on sloped pastures

Additionally monitored sapling features:

- Habitat: Extrafloral nectaries (✓) for ants; bird nests (✓)
- Pests & diseases: *Epicaula atomaria* (#), leafcutter ants (✓), plant galls (✓)
- Vigor: (T1:+++; T2:++; T3:+)

Infobox: Land Degradation in Itaocara

Late Pleistocene

Anthropocene

Epoch

- a Pliocene / Early Pleistocene – humid
- b Pleistocene – cool & dry
- c Pleistocene / Holocene – warm & humid
- d Anthropocene – humid

Conclusion

Landscapes in SE-Brazil are severely degraded due to historic deforestation, geo-ecologic susceptibility and recent inappropriate land use. Today, the vast majority of pristine Atlantic Forest has been removed and replaced by pastures for smallholder dairy farming. In the state of Rio de Janeiro, hilly to steep relief positions and unsustainable or lacking management (e.g. overstocking, overgrazing) make pastures highly prone to erosion (sheet, rill and gully). Pasture rehabilitation measures (PRM) are urgently needed to avoid the development and expansion of badlands with no or low productivity. The presented PRM *Slope Parcelling Hedgerow Terraces for Extensive Rotational Cattle Farming* is a modular approach to reduce soil erosion and to raise pasture stability and productivity – at low cost, low man-power and taking into account farmers concerns and best practices. It is embedded in the overall concept in moving dairy/cattle from sensitive, extensively used sloped pastures to stable, intensively used plain areas (rotational grazing).

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