A herd of small ruminants passing a well established couloir (Fodé Boubacar Camara, PAFN)

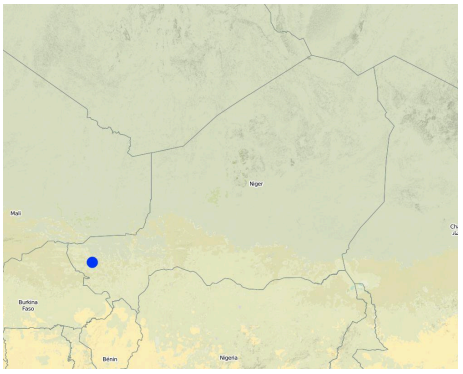
Couloirs de passage (Niger)

DESCRIPTION

The 'couloirs de passage' are formally defined passageways which channel the movements of livestock herds in the agro-pastoral zones of Niger, by linking pastures, water points and coralling areas, be it within village areas (internal couloirs) or on open land (external couloirs).

The main goal of the couloirs is the prevention of conflict between agriculturalists and pastoralists regarding the use of limited land and water resources. These conflicts are often provoked by cattle entering cropping areas. The establishment of demarcated passageways allows the livestock to access water points and pastures without causing damage to cropland. The corridors are regulated through the 'code rural' – a national law defining the land use rights of the pastoralists. Demarcation of couloirs is based on a consensual decision of all concerned interest groups. Internal couloirs are negotiated in a general on-site assembly involving all stakeholders (farmers, breeders, women's groups, local authorities). For the demarcation of external couloirs the involvement of transhumance herders and neighboring villages is indispensable. Once an agreement on the course of the couloir is achieved, demarcation with stones and/or boundary planting with selected tree species is carried out by the local land users - with financial and technical assistance of the government or NGOs. Common species involve: Euphorbia balsamifera, Acacia spp. (A. nilotica; A. senegal); and Faidherbia albida. Management committees at the community level draw up regulations for the management of the couloirs (maintenance and protection of vegetation). Protection of plants is achieved through dead branches (at the initial stage), daily control by forest guards, and information campaigns. The technology is a sustainable solution to the described conflicts. As a valuable by-product the trees along the demarcation lines provide of wood and non-woody by-products.

LOCATION



Location: Tillabéri North, Niger

No. of Technology sites analysed:

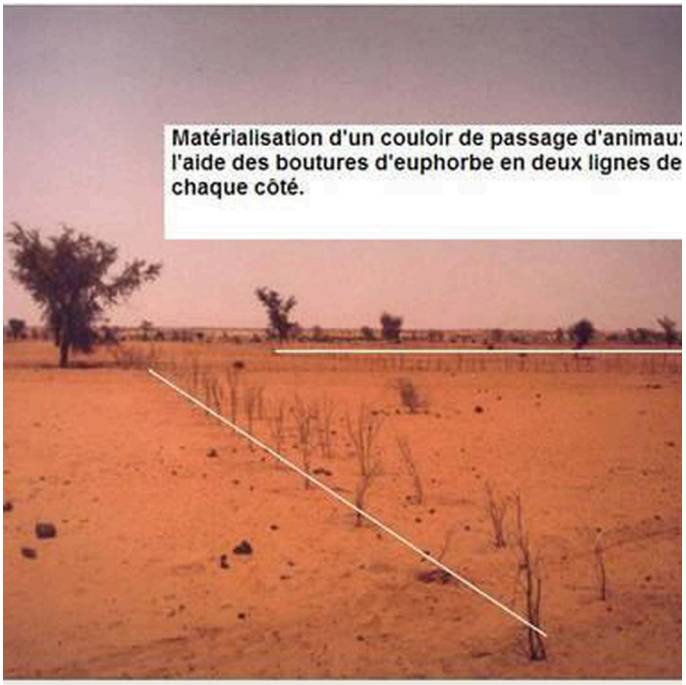
Geo-reference of selected sites
- 1.4, 14.1

Spread of the Technology: applied at specific points/ concentrated on a small area

In a permanently protected area?:

Date of implementation:

Type of introduction
- ☐ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☑ through projects/ external interventions



Demarcation of a couloir de passage with two lines of Euphorbia seedlings (LUCOP / Abdoulaye Soumaila)

Finding a consensus on a new couloir de passage in a general assembly involving all stakeholders at community level (Charles Bielders, property of)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ☐ improve production
- ☐ reduce, prevent, restore land degradation
- ☐ conserve ecosystem
- ☐ protect a watershed/ downstream areas – in combination with other Technologies
- ☐ preserve/ improve biodiversity
- ☐ reduce risk of disasters
- ☐ adapt to climate change/ extremes and its impacts
- ☐ mitigate climate change and its impacts
- ☐ create beneficial economic impact
- ☑ create beneficial social impact

Land use

Land use mixed within the same land unit: Ja - Silvo-pastoralism

Grazing land

- Semi-nomadic pastoralism

Forest/ woodlands

Water supply

- ☑ rainfed
- ☐ mixed rainfed-irrigated
- ☐ full irrigation

Purpose related to land degradation

- ☑ prevent land degradation
- ☐ reduce land degradation
- ☐ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

Degradation addressed

soil erosion by water - Wt: loss of topsoil/ surface erosion

soil erosion by wind - Et: loss of topsoil

biological degradation - Bc: reduction of vegetation cover

SLM group

- pastoralism and grazing land management

SLM measures

vegetative measures - V1: Tree and shrub cover

management measures - M3: Layout according to natural and human environment

TECHNICAL DRAWING

Technical specifications

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: **USD**
- Exchange rate (to USD): 1 USD = n.a

Most important factors affecting the costs

The costs of the planning meeting (general assembly) and the stones for delimitation were not taken into account. Daily salary for field work is US$ 1.5.

- Average wage cost of hired labour per day: 1.5

Establishment activities

1. Identification of an existing couloir or definition of a new passageway by means of a general assembly (Timing/ frequency: None)
2. Alignment of corridor boundaries e.g. by establishing stone lines. Internal couloirs are 10 to 50 m wide, whereas external couloirs exceed a width of 50 m (Timing/ frequency: None)
3. Digging 40 cm deep pits; tree planting along boundaries (with a spacing of 1-3 meters, depending on the species selected and the secondary objective) (Timing/ frequency: None)

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (USD)	Total costs per input (USD)	% of costs borne by land users
Labour					
Identification of an existing couloir or definition of a new passageway	persons/day	25.0	1.5	37.5	5.0
Plant material					
Tree planting along boundaries (seedlings)	pieces	670.0	2.05	1373.5	5.0
Total costs for establishment of the Technology				**1'411.0**	
Total costs for establishment of the Technology in USD				*1'411.0*	

Maintenance activities

1. Protection of trees (through dead branches, guards, information campaigns) (Timing/ frequency: None)
2. Replanting tree seedlings to fill gaps (annually, beginning of rainy season) (Timing/ frequency: None)

Maintenance inputs and costs

Specify input	Unit	Quantity	Costs per Unit (USD)	Total costs per input (USD)	% of costs borne by land users
Labour					
Protection of trees	persons/day	4.0	1.5	6.0	100.0
Plant material					
Replanting tree seedlings	pieces	67.0	2.0448	137.0	100.0
Total costs for maintenance of the Technology				**143.0**	
Total costs for maintenance of the Technology in USD				*143.0*	

NATURAL ENVIRONMENT

Average annual rainfall

- [ ] < 250 mm
- [x] 251-500 mm
- [ ] 501-750 mm
- [ ] 751-1,000 mm
- [ ] 1,001-1,500 mm
- [ ] 1,501-2,000 mm
- [ ] 2,001-3,000 mm
- [ ] 3,001-4,000 mm
- [ ] > 4,000 mm

Agro-climatic zone

- [ ] humid
- [ ] sub-humid
- [x] semi-arid
- [ ] arid

Specifications on climate

Thermal climate class: tropics

Slope

- [x] flat (0-2%)
- [ ] gentle (3-5%)
- [ ] moderate (6-10%)
- [ ] rolling (11-15%)
- [ ] hilly (16-30%)
- [ ] steep (31-60%)
- [ ] very steep (>60%)

Landforms

- [x] plateau/plains
- [ ] ridges
- [ ] mountain slopes
- [ ] hill slopes
- [ ] footslopes
- [x] valley floors

Altitude

- [x] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [ ] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [ ] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

Technology is applied in

- [ ] convex situations
- [ ] concave situations
- [ ] not relevant

Soil depth

- [ ] very shallow (0-20 cm)
- [ ] shallow (21-50 cm)
- [ ] moderately deep (51-80 cm)
- [ ] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)

- [x] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- [ ] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Topsoil organic matter content

- [ ] high (>3%)
- [ ] medium (1-3%)
- [x] low (<1%)

Groundwater table

- [ ] on surface
- [ ] < 5 m
- [ ] 5-50 m
- [ ] > 50 m

Availability of surface water

- [ ] excess
- [ ] good
- [ ] medium
- [ ] poor/ none

Water quality (untreated)

- [ ] good drinking water
- [ ] poor drinking water (treatment required)
- [ ] for agricultural use only (irrigation)
- [ ] unusable

Is salinity a problem?

- [ ] Ja
- [ ] Nee

Occurrence of flooding

- [ ] Ja
- [ ] Nee

Species diversity
- [ ] high
- [ ] medium
- [ ] low

Habitat diversity
- [ ] high
- [ ] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [x] subsistence (self-supply)
- [x] mixed (subsistence/ commercial)
- [ ] commercial/ market

Off-farm income
- [ ] less than 10% of all income
- [ ] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [ ] poor
- [ ] average
- [ ] rich
- [ ] very rich

Level of mechanization
- [ ] manual work
- [x] animal traction
- [ ] mechanized/ motorized

Sedentary or nomadic
- [ ] Sedentary
- [ ] Semi-nomadic
- [ ] Nomadic

Individuals or groups
- [ ] individual/ household
- [x] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [ ] women
- [ ] men

Age
- [ ] children
- [ ] youth
- [ ] middle-aged
- [ ] elderly

Area used per household
- [ ] < 0.5 ha
- [ ] 0.5-1 ha
- [x] 1-2 ha
- [ ] 2-5 ha
- [ ] 5-15 ha
- [ ] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [ ] small-scale
- [ ] medium-scale
- [ ] large-scale

Land ownership
- [ ] state
- [ ] company
- [ ] communal/ village
- [ ] group
- [ ] individual, not titled
- [x] individual, titled

Land use rights
- [ ] open access (unorganized)
- [x] communal (organized)
- [ ] leased
- [x] individual

Water use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [ ] individual

Access to services and infrastructure

IMPACTS

Socio-economic impacts

Crop production	decreased	increased
fodder production	decreased	increased
fodder quality	decreased	increased
animal production	decreased	increased
farm income	decreased	increased

Socio-cultural impacts

cultural opportunities (eg spiritual, aesthetic, others)	reduced	improved	
community institutions	weakened	strengthened	Through mutual aid in technology implementation
national institutions	weakened	strengthened	Code rural secretariat
SLM/ land degradation knowledge	reduced	improved	

Ecological impacts

soil cover	reduced	improved
soil loss	increased	decreased
nutrient cycling/ recharge	decreased	increased
biomass/ above ground C	decreased	increased
animal diversity	decreased	increased
fire risk	increased	decreased
wind velocity	increased	decreased

Off-site impacts

wind transported sediments	increased	reduced
damage on neighbours' fields	increased	reduced
damage on public/ private infrastructure	increased	reduced

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative	very positive

Long-term returns very negative ✓ very positive

Benefits compared with maintenance costs

Short-term returns very negative ✓ very positive

Long-term returns very negative ✓ very positive

Peace between communities is the key result on short term and on long term. Ecological and economic benefits are linked to the plantation of trees and the improved management of natural resources

CLIMATE CHANGE

-

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- ✓ 0-10%
- 11-50%
- 51-90%
- 91-100%

Has the Technology been modified recently to adapt to changing conditions?

- Ja
- Nee

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

Strengths: compiler's or other key resource person's view

- The technology provides a sustainable solution to conflicts between agriculturalists and pastoralists

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

- Implementation constraints: plant production is very expensive and reaching a consensus on the transformation of private cropland to communal passageways is very difficult definition of the couloirs as public infrastructure and enhancement of organizational capacities of the local population through training and information sessions
- Maintenance constraints: maintenance can only be realized by adjacent land owners, as the community organizations are weak reinforce the institutional capacities of livestock owners and farmers to manage the couloirs
- In the pastoral zone the couloirs lead to conflicts between pastoralists and private ranches establish community-based land tenure commissions and introduce new laws on land property in the pastoral zone

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

REFERENCES

Compiler
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Editors

Reviewer
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Date of documentation: Nov. 11, 2010

Last update: Junie 6, 2019

Resource persons
Soumaila Abdoulaye - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/technologies/view/technologies_1353/

Linked SLM data
Approaches: Pastoralisme au Niger : Système de suivi des mouvements et stratégies d'adaptation spatiale des éleveurs transhumants https://qcat.wocat.net/af/wocat/approaches/view/approaches_2328/
Approaches: Champ Ecole Pastorale https://qcat.wocat.net/af/wocat/approaches/view/approaches_2324/
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Documentation was faciliated by

Institution
- GREAD (GREAD) - Niger

Project
- n.a.

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