
Camp of Arab camel herders during their seasonal migration (Project Almy Al Afia)

# Securing the mobility of pastoralism through consultation and access to water sources (Chad)

Projet Almy Al Afia

## DESCRIPTION

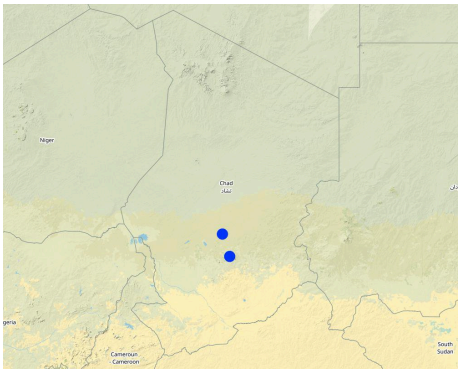
**Securing the mobility of pastoralism through access to water sources (open wells and ponds in pastoral areas) and marking the livestock routes for transhumance: the case of the project Almy Al Afia in Chad and its consultative approach.**

Livestock keeping is one of the main economic resources in Chad (in support of 40% of the population and 18% of the GDP, Ministry of Livestock, General census). Pastoralism in the country is based on the mobility of herds in a context of irregular precipitation and variable forage resources in time and space, and benefits from complementary relationships between the different ecological zones. In Chad, herds are taken in regular movements with the seasons between the Sahelian and the Sudanese grazing areas. The former are nutritious but limited in quantity, while the latter are more abundant but of lower quality, and not accessible until the fields are cleared after the harvest (meta-evaluation of projects on pastoral water sources, IIED, 2013). Thus, pastoral livestock keeping is founded on mobility and rangeland management, and on building complementary relationships and trade around farming systems and cultivated areas. The pastoralist systems are economically competitive (limited use of food inputs), and occur in marginal land which is characterized by conflicts, riots and a high level of insecurity (Conference of N'Djamena: 'Pastoral livestock keeping: a sustainable contribution to development and security in Saharan and Sahelian regions'). In the pastoral zone of Chad, where access to water is limited, the management and control of water sources by a social group in practice also leads to the monitoring and control of the use of grazing land which becomes available when water is present.

The project Almy Al Afia (2004-2016), developed by a partnership between the AFD and the Ministry of Water of Chad, operated in two regions of central Chad. The project Almy Al Afia was based on an entry 'development', concurrently with a process to consult and involve joint agencies. The project has improved approaches of preceding initiatives: concerted action and identification of water sources derived from the dialogue between users and authorities, and development of the local management of infrastructures and rangeland. The latter counteracts an exclusively private management or, instead, an ineffective public management which promotes free access to water sources and grazing land.

The project has enabled to address the following points:
1. Support mobility in pastoralism by enhancing the access to water (rehabilitation and construction of 160 wells; digging of 31 ponds for pastoral use);
2. Maintain or build processes of consultation and restoring security (joint committees for consultation and prevention of conflicts during transhumance);
3. Promote the proper use of water supply structures, in time and space (rehabilitated and new wells, excavated ponds) by context-specific management (strengthening of traditional management systems) and encourage the maintenance of infrastructure.
The pastoral ponds should be constructed in locations of existing water sources (natural ponds in suitable places, i.e. with a clayey soil capable to retain water). The existing water source is enlarged and improved by rural engineering (enlargement of the surface, deepening). The wells are rehabilitated. Most wells were constructed several decades ago and are severely damaged. The water supply structures all have different and complementary functions. The deep wells in the pastoral zone are generally used throughout the year, and are overexploited. The way in which these structures are managed is strongly anchored in the region. The District officer delegates the management to 'Heads of Wells'. These old wells, which are used day and night, are often in a poor condition. Rehabilitating degraded wells is given priority over digging new wells because of the substantial potential for conflict. The water supply structures in areas of dry forest are less old and smaller in number. These wells are less frequently used and function as an alternative water source when the traditional ponds, water reservoirs and wells have dried up. They allow to delay the movement of the herds towards grazing areas in the Sahelian zone.

## LOCATION




**Location:** Although the sites where the technology was applied are at the local scale, the project has considered pastoralism and the relationships between the two regions at the broader landscape scale., Regions of Batha and of Guéra, Chad

**No. of Technology sites analysed:** 100-1000 sites

**Geo-reference of selected sites**
- 18.33618, 13.2239
- 18.69324, 12.1736

**Spread of the Technology:** evenly spread over an area (approx. 10-100 km2)

**In a permanently protected area?:**

**Date of implementation:** 2018

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

The strip between these two zones is used for agropastoralism. Herds cannot remain there. Therefore the project has facilitated the movement of the herds to the zones further south. The pastoral ponds close to the livestock routes for the transhumance were created in a way to be easily used by the herders, but also to encourage short stays.
The approach was combined with consultation through joint committees for the prevention of conflicts, and at a later stage by marking of sections of the livestock routes for the transhumance. Many meetings were held with the users of the land management structures and policy makers, with the aim to identify and negotiate the target sites and to anticipate methods for the management and maintenance of the structures. This has enabled to maintain an atmosphere of social stability conducive to cooperation. Along almost 550 km of the livestock routes for the transhumance, sections were marked ('mourhals' in Chadian Arabic). The demarcation was not intended to enclose the herds in the livestock corridors (from which they can move freely outside the growing seasons for agricultural crops), but rather to implement the results of the consultations on the land use on the ground. The committees for the prevention of conflicts, which were supported by the project, also played a major role.


Use of a well as a water source for herds in the north of Batha (Project Almy Al Afia)

Picture of the demarcation of livestock corridors (Project Almy Al Afia)

## CLASSIFICATION OF THE TECHNOLOGY

### Main purpose

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

### Land use

**Grazing land**

- Nomadism
- Semi-nomadic pastoralism

Animal type: camels

### Water supply

- [x] rainfed
- [ ] mixed rainfed-irrigated
- [ ] full irrigation

### Purpose related to land degradation

- [x] prevent land degradation
- [x] 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, Eo: offsite degradation effects

**physical soil deterioration** - Ps: subsidence of organic soils, settling of soil

**biological degradation** - Bc: reduction of vegetation cover, Bq: quantity/ biomass decline

**water degradation** - Hs: change in quantity of surface water, Hg: change in groundwater/aquifer level, Hp: decline of surface water quality, Hq: decline of groundwater quality

### SLM group

- pastoralism and grazing land management

### SLM measures

- ground water management

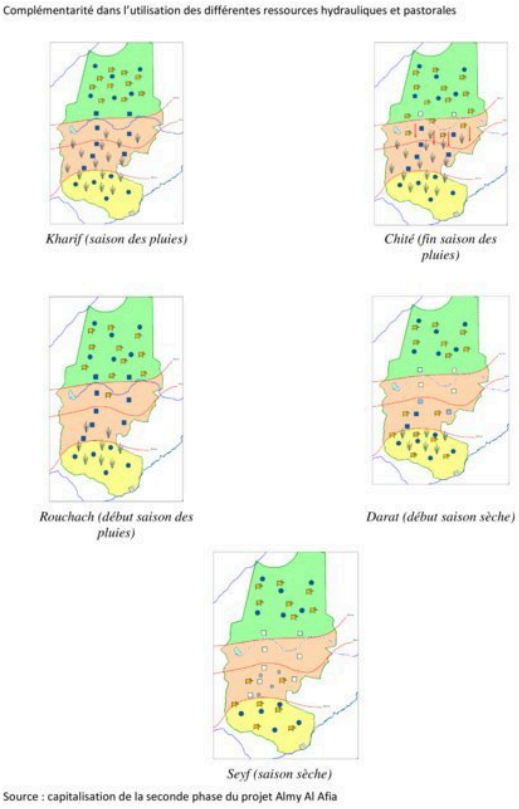
**structural measures** - S8: Sanitation/ waste water structures

**management measures** - M2: Change of management/ intensity level, M3: Layout according to natural and human environment

## TECHNICAL DRAWING

### Technical specifications

The wells (new and rehabilitated) and the demarcation of the livestock routes are the outcome of a long process of outreach. The communications between the local level (taking account of the views of future users) and the level of decision-making (administration) enable social agreements to be formalized. These agreements set the rules for the selection of the locations of the water supply structures, their management and maintenance.




Author: Project Almy Al Afia

## ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

### Calculation of inputs and costs

- Costs are calculated: per Technology unit (unit: **Structure (new well, rehabilitation or km of markings)**)
- Currency used for cost calculation: **FCFA**
- Exchange rate (to USD): 1 USD = n.a FCFA
- Average wage cost of hired labour per day: 1000 FCFA

### Most important factors affecting the costs

The costs of the constructions are highly dependent on their location (costs for the supply and disposal of equipment and materials), on the price of inputs (cement, etc.), and especially on the type of structure (depth of the wells, geological environment). The costs of the supply and disposal of equipment and materials include costs for the installation of the structures (water, cement, labour, machinery) on the construction sites (which are often far away from routes and towns), and costs for the disposal of the equipment after the construction is completed. The costs of supply and disposal can be significant with respect to the costs of the structure itself.

### Establishment activities

1. Outreach / awareness raising (Timing/ frequency: Four to six meetings prior to the signing of the social agreements)
2. Construction of the facilities (Timing/ frequency: Four to six months, depending on the type of structure and its depth)
3. Monitoring the management (Timing/ frequency: Regular visits of the project team to support the implementation of adapted management practices)

### Establishment inputs and costs (per Structure (new well, rehabilitation or km of markings))

| Specify input | Unit | Quantity | Costs per Unit (FCFA) | Total costs per input (FCFA) | % of costs borne by land users |
|---|---|---|---|---|---|
| **Construction material** | | | | | |
| Rehabilitated wells (mean depth 56 m) | 1 | 93.0 | 10497939.0 | 976308327.0 | |
| Geophysical assessment for new wells | 1 | 158.0 | 17979914.0 | 2840826412.0 | |
| Exploration drilling for new wells (mean depth 96 m) | 1 | 220.0 | 6005415.0 | 1321191300.0 | |

| | | | | | |
|---|---|---|---|---|---|
| New wells (mean depth 45 m) | 1 | 62.0 | 45145740.0 | 2799035880.0 | |
| Pastoral ponds (6000 m3 on average) | 1 | 31.0 | 23008065.0 | 713250015.0 | |
| Markers (8 signs / km) | 1 | 492.0 | 1069203.0 | 526047876.0 | |
| **Other** | | | | | |
| Outreach on new wells (/site) | 1 | 62.0 | 213428.0 | 13232536.0 | |
| Outreach on rehabilitation (/site) | 1 | 93.0 | 248695.0 | 23128635.0 | |
| Outreach on marking (/km) | 1 | 492.0 | 52088.0 | 25627296.0 | |
| **Total costs for establishment of the Technology** | | | | **9'238'648'277.0** | |
| *Total costs for establishment of the Technology in USD* | | | | *9'238'648'277.0* | |

Maintenance activities

1. Mobilising indigenous groups for day-to-day maintenance of structures (dredging, cleaning) (Timing/ frequency: Depending on the type of structure (generally monthly))

Maintenance inputs and costs (per Structure (new well, rehabilitation or km of markings))

| Specify input | Unit | Quantity | Costs per Unit (FCFA) | Total costs per input (FCFA) | % of costs borne by land users |
|---|---|---|---|---|---|
| **Labour** | | | | | |
| Support missions for the management and maintenance of the water supply structures (2 missions per structure for the entire project) | 1 | 155.0 | 53000.0 | 8215000.0 | |
| Support mission for the management and maintenance of the markings | 1 | 100.0 | 53000.0 | 5300000.0 | |
| **Total costs for maintenance of the Technology** | | | | **13'515'000.0** | |
| *Total costs for maintenance of the Technology in USD* | | | | *13'515'000.0* | |

## 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
- [x] arid

### Specifications on climate

One rainy season per year (from June to September)
Name of the meteorological station: Ati
The target region includes large areas extending over important gradients (encompassing boundaries of the desert zone, the forested zone and the cotton-growing zone).

### 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
- [ ] valley floors

### Altitude

- [ ] 0-100 m a.s.l.
- [x] 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
- [x] not relevant

### Soil depth

- [x] 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)

- [x] 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
- [x] > 50 m

### Availability of surface water

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

### Water quality (untreated)

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

*Water quality refers to:*

### Is salinity a problem?

- [x] Ja
- [ ] Nee

### Occurrence of flooding

- [ ] Ja
- [x] Nee

### Species diversity

- [ ] high
- [x] medium
- [ ] low

### Habitat diversity

- [ ] high
- [x] medium
- [ ] low

## CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

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

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

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

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

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

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

### Gender
- [x] women
- [x] men

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

### Area used per household
- [ ] < 0.5 ha
- [ ] 0.5-1 ha
- [ ] 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
- [x] > 10,000 ha

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

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

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

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

### Access to services and infrastructure

| | | |
|---|---|---|
| health | poor ✓ | good |
| education | poor ✓ | good |
| technical assistance | poor ✓ | good |
| employment (e.g. off-farm) | poor ✓ | good |
| markets | poor ✓ | good |
| energy | poor ✓ | good |
| roads and transport | poor ✓ | good |
| drinking water and sanitation | poor ✓ | good |
| financial services | poor ✓ | good |

## IMPACTS

### Socio-economic impacts

water availability for livestock

decreased ✓ increased

Quantity before SLM: n/a
Quantity after SLM: n/a
Expansion of the areas covered by water supply points. Reduced closure of water supply points (rehabilitation), opening-up of new grazing land, securing the movement of livestock and people.

water quality for livestock

decreased ✓ increased

Quantity before SLM: n/a
Quantity after SLM: n/a

### Socio-cultural impacts

food security/ self-sufficiency

reduced ✓ improved

Preserving the capacity of herders and their families to move, to choose their trajectories rather than responding to imposed conditions.

land use/ water rights

worsened ✓ improved

Quantity before SLM: n/a
Quantity after SLM: n/a
Upgrading of traditional management systems of water supply structures.

community institutions: weakened ✓ strengthened

conflict mitigation: worsened ✓ improved

situation of socially and economically disadvantaged groups (gender, age, status, ehtnicity etc.): worsened ✓ improved

### Ecological impacts

soil cover

reduced ✓ improved

Reduction of the impacts of the concentration of livestock and people in small areas. Promotes the complementary relations between the zones (pressure relief in some zones and use and maintenance of other zones), and over the seasons.

soil organic matter/ below ground C

decreased ✓ increased

vegetation cover — decreased — increased
plant diversity — decreased — increased
drought impacts — increased — decreased

**Off-site impacts**

water availability (groundwater, springs) — decreased — increased

Quantity before SLM: n/a
Quantity after SLM: n/a
Increased access to groundwater through the rehabilitation of wells and the construction of new wells.

## 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

The profitability is considered in relation to the number of animals/herds involved. The costs of construction and rehabilitation are certainly significant, but the water supply structures are used for thousands of animals (in case of the most heavily used wells); most animals drink every two days. Therefore the costs per head of livestock are limited. The wells are long lasting, and therefore the returns are positive in the short and the long term.

## CLIMATE CHANGE

**Gradual climate change**

annual rainfall decrease — not well at all — very well
seasonal rainfall decrease — not well at all — very well — Season: wet/ rainy season

**Climate-related extremes (disasters)**

drought — not well at all — very well

## ADOPTION AND ADAPTATION

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

- [ ] single cases/ experimental
- [ ] 1-10%
- [ ] 11-50%
- [x] > 50%

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

- [ ] 0-10%
- [ ] 11-50%
- [ ] 51-90%
- [x] 91-100%

**Number of households and/ or area covered**

The technology responds to a substantial need, but also corresponds to the capacity of land users to use and maintain the structures. The energy supply is provided by animal traction, and does not require external energy sources.

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

- [ ] Ja
- [x] 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**

- Permanent access to water.
- Reopening of water supply structures and consolidation of access to water at some degraded sites.
- Agencies and authorities for conflict prevention.
- Marking of sections of livestock corridors with conflict situations.

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

- Full commitment of groups (access to water is a major problem).
- Continuation of the approach through the development of other projects and inclusion at the national level.

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

- Interventions are limited with regard to the needs (rehabilitation in particular). By larger investments and better integration of the approach in public action.
- There is a need to extend the approach, in particular the support to the consultative bodies. Formalize support to the consultation process.

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

- Recognition of the experiences, the approach and the methodology in other interventions.
  Outreach and awareness raising are performed during the project, but at the end the management of the infrastructure is no longer supported. The government should be able to follow up on the

support (mechanism for monitoring and maintenance). Formalize support to the consultation process.
- There is a need to mainstream outreach and consultation (lengthy process). Formalize support to the consultation process.

## REFERENCES


**Compiler**
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**Resource persons**
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**Full description in the WOCAT database**
https://qcat.wocat.net/af/wocat/technologies/view/technologies_3356/

**Linked SLM data**
n.a.

**Documentation was faciliated by**

Institution
- n.a.

Project
- Book project: Guidelines to Rangeland Management in Sub-Saharan Africa (Rangeland Management)

**Key references**


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- Document de Suivi-Evaluation des activités du PHPTC II, tableau de bord des activités du projet, DHP, Antea/Iram, mars 2016: Republic of Chad, General Secretariat, Ministry of Water, Directorate of Pastoral Water Resources
- Note Entretiens Techniques du PRAPS, Accès et gestion durable des espaces pastoraux (chemins de transhumance, aires de pâturages et de repos), PRAPS, 2016, B. Bonnet, A. H. Dia, P. Ndiaye, I. Touré: Republic of Chad, General Secretariat, Ministry of Water, Directorate of Pastoral Water Resources
- Evaluation et capitalisation de 20 ans d'intervention du Groupe AFD portant sur le secteur de l'Hydraulique Pastorale au Tchad, IIED, May 2013, S. Krätli, M. Monimart, B. Jallo, J. Swift, C. Hesse: Republic of Chad, General Secretariat, Ministry of Water, Directorate of Pastoral Water Resources


**Links to relevant information which is available online**
- Platform on pastoralism in Chad: www.plateforme-pastorale-tchad.org/
- Website of PRAPS-TD: www.praps.cilss.int/index.php/praps-pays-tchad/
- Website of Iram: https://www.iram-fr.org/elevage-pastoralisme-et-hydraulique-pastorale.html
- AFD in Chad: http://www.afd.fr/fr/page-region-pays/tchad