



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

DESCRIPCIÓN

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.

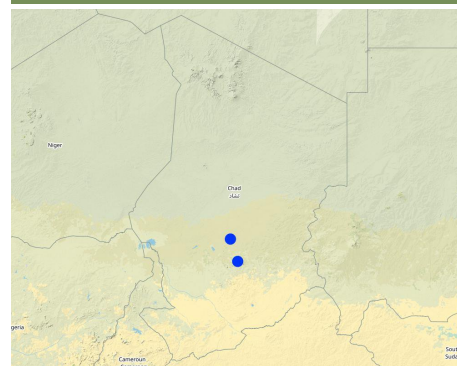
Livestock keeping is one of the main economic resources in Chad (in support of 40% of the population and 18% of the GDP, Ministry of Livestock, General census). Pastoralism in the country is based on the mobility of herds in a context of irregular precipitation and variable forage resources in time and 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.

LUGAR



Lugar: 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. de sitios de Tecnología analizados: 100-1000 sitios

Georreferencia de sitios seleccionados

- 18.33618, 13.2239
- 18.69324, 12.1736

Difusión de la Tecnología: distribuida parejamente sobre un área (approx. 10-100 km2)

¿En un área de protección permanente?:

Fecha de la implementación: 2018

Tipo de introducción

- ☒ mediante la innovación de usuarios de tierras
- ☒ como parte de un sistema tradicional (> 50 años)
- ☐ durante experimentos/ investigación
- ☐ mediante proyectos/ intervenciones externas

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 ('mourhais' 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)

CLASIFICACIÓN DE LA TECNOLOGÍA

Propósito principal

- ☐ mejorar la producción
- ☒ reducir, prevenir, restaurar la degradación de la tierra
- ☒ conservar el ecosistema
- ☒ proteger una cuenca hidrográfica/ áreas corriente abajo – en combinación con otras Tecnologías
- ☒ preservar/ mejorar biodiversidad
- ☒ reducir el riesgo de desastres naturales
- ☐ adaptarse al cambio climático/ extremos climáticos y sus impactos
- ☐ mitigar cambio climático y sus impactos
- ☒ crear impacto económico benéfico
- ☒ crear impacto social benéfico

Uso de tierra



Tierra de pastoreo

- Nomadismo
 - Pastoralismo semi-nómada
- Tipo de animal: camellos

Provisión de agua

- ☒ de secano
- ☐ mixta de secano – irrigada
- ☐ totalmente irrigada

Propósito relacionado a la degradación de las tierras

- ☒ prevenir la degradación de la tierra
- ☒ reducir la degradación de la tierra
- ☐ restaurar/ rehabilitar tierra severamente degradada
- ☐ adaptarse a la degradación de la tierra
- ☐ no aplica

La degradación considerada



erosión de suelos por agua - Wt: pérdida de capa arable/ erosión de la superficie



erosión de suelos por viento - Et: pérdida de capa arable , Eo: efectos de degradación fuera del sitio:



deterioro físico del suelo - Ps: hundimiento de suelos orgánicos, asentamiento del suelo



degradación biológica - Bc: reducción de la cobertura vegetal del suelo , Bq: reducción de la cantidad/ biomasa



degradación del agua - Hs: cambio en la cantidad de aguas superficiales, Hg: cambio en nivel de aguas subterráneas/ nivel de acuífero, Hq: reducción de la calidad de subterráneas, Hq: reducción de la calidad de aguas subterráneas

Grupo MST

- pastoralismo y manejo de tierras de pastoreo
- manejo de agua subterránea

Medidas MST



medidas estructurales - S8: Saneamiento/ estructuras para aguas residuales



medidas de manejo - M2: Cambio de gestión/ nivel de intensidad , M3: disposición de acuerdo al entorno natural y humano

DIBUJO TÉCNICO

Especificaciones técnicas

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.

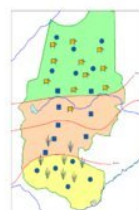
Complémentarité dans l'utilisation des différentes ressources hydrauliques et pastorales



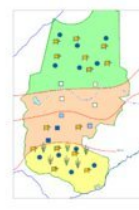
Kharij (saison des pluies)



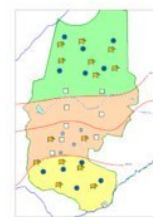
Chité (fin saison des pluies)



Rouachach (début saison des pluies)



Darat (début saison sèche)



Seyf (saison sèche)

Source : capitalisation de la seconde phase du projet Almy Al Afa

Author: Project Almy Al Afa

ESTABLECIMIENTO/ MANTENIMIENTO: ACTIVIDADES, INSUMOS Y COSTOS

Cálculo de insumos y costos

- Los costos se calculan: por unidad de Tecnología (unidad: **Structure (new well, rehabilitation or km of markings)**)
- Moneda usada para calcular costos: **FCFA**
- Tasa de cambio (a USD): 1 USD = n.d. FCFA
- Costo promedio por día del sueldo de la mano de obra contratada: 1000 FCFA

Factores más determinantes que afectan los costos

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.

Actividades de establecimiento

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

Insumos y costos para establecimiento (per Structure (new well, rehabilitation or km of markings))

Especifique insumo	Unidad	Cantidad	Costos por unidad (FCFA)	Costos totales por insumo (FCFA)	% de los costos cubiertos por los usuarios de las tierras
Material de construcción					

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	
Otros					
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	
Costos totales para establecer la Tecnología				9'238'648'277.0	
<i>Costos totales para establecer la Tecnología en USD</i>				<i>9'238'648'277.0</i>	

Actividades de mantenimiento

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

Insumos y costos de mantenimiento (per Structure (new well, rehabilitation or km of markings))

Especifique insumo	Unidad	Cantidad	Costos por unidad (FCFA)	Costos totales por insumo (FCFA)	% de los costos cubiertos por los usuarios de las tierras
Mano de obra					
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	
Indique los costos totales para mantener la Tecnología				13'515'000.0	
<i>Costos totales para mantener la Tecnología en USD</i>				<i>13'515'000.0</i>	

ENTORNO NATURAL

Promedio anual de lluvia

- ☐ < 250 mm
- ☒ 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

Zona agroclimática

- ☐ húmeda
- ☐ Sub-húmeda
- ☒ semi-árida
- ☒ árida

Especificaciones sobre el clima

One rainy season per year (from June to September)
Nombre de la estación meteorológica: 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).

Pendiente

- ☒ plana (0-2 %)
- ☐ ligera (3-5%)
- ☐ moderada (6-10%)
- ☐ ondulada (11-15%)
- ☐ accidentada (16-30%)
- ☐ empinada (31-60%)
- ☐ muy empinada (>60%)

Formaciones telúricas

- ☒ meseta/ planicies
- ☐ cordilleras
- ☐ laderas montañosas
- ☐ laderas de cerro
- ☐ pies de monte
- ☐ fondo del valle

Altura

- ☐ 0-100 m s.n.m.
- ☒ 101-500 m s.n.m.
- ☐ 501-1,000 m s.n.m
- ☐ 1,001-1,500 m s.n.m
- ☐ 1,501-2,000 m s.n.m
- ☐ 2,001-2,500 m s.n.m
- ☐ 2,501-3,000 m s.n.m
- ☐ 3,001-4,000 m s.n.m
- ☐ > 4,000 m s.n.m

La Tecnología se aplica en

- ☐ situaciones convexas
- ☐ situaciones cóncavas
- ☒ no relevante

Profundidad promedio del suelo

- ☒ muy superficial (0-20 cm)
- ☐ superficial (21-50 cm)
- ☐ moderadamente profunda (51-80 cm)
- ☐ profunda (81-120 cm)
- ☐ muy profunda (>120 cm)

Textura del suelo (capa arable)

- ☒ áspera/ ligera (arenosa)
- ☐ mediana (limosa)
- ☐ fina/ pesada (arcilla)

Textura del suelo (> 20 cm debajo de la superficie)

- ☒ áspera/ ligera (arenosa)
- ☐ mediana (limosa)
- ☐ fina/ pesada (arcilla)

Materia orgánica de capa arable

- ☐ elevada (>3%)
- ☐ media (1-3%)
- ☒ baja (<1%)

Agua subterránea

- ☐ en superficie
- ☐ < 5 m
- ☐ 5-50 m
- ☒ > 50 m

Disponibilidad de aguas superficiales

- ☐ excesiva
- ☐ bueno
- ☐ mediana
- ☒ pobre/ ninguna

Calidad de agua (sin tratar)

- ☒ agua potable de buena calidad
- ☐ agua potable de mala calidad (requiere tratamiento)
- ☐ solo para uso agrícola (irrigación)
- ☐ inutilizable

La calidad de agua se refiere a:

¿La salinidad de la agua es un problema?

- ☒ Sí
- ☐ No

Incidencia de inundaciones

- ☐ Sí
- ☒ No

Diversidad de especies

- ☐ elevada
- ☒ mediana
- ☐ baja

Diversidad de hábitats

- ☐ elevada
- ☒ mediana
- ☐ baja

LAS CARACTERÍSTICAS DE LOS USUARIOS DE LA TIERRA QUE APLICAN LA TECNOLOGÍA

Orientación del mercado

- ☐ subsistencia (autoprovisionamiento)
- ☒ mixta (subsistencia/comercial)
- ☐ comercial/ mercado

Ingresos no agrarios

- ☒ menos del 10% de todos los ingresos
- ☐ 10-50% de todo el ingreso
- ☐ > 50% de todo el ingreso

Nivel relativo de riqueza

- ☒ muy pobre
- ☒ pobre
- ☐ promedio
- ☐ rico
- ☐ muy rico

Nivel de mecanización

- ☒ trabajo manual
- ☐ tracción animal
- ☐ mecanizado/motorizado

Sedentario o nómada

- ☐ Sedentario
- ☒ Semi-nómada
- ☒ Nómada

Individuos o grupos

- ☐ individual/ doméstico
- ☒ grupos/ comunal
- ☐ cooperativa
- ☐ empleado (compañía, gobierno)

Género

- ☒ mujeres
- ☒ hombres

Edad

- ☐ niños
- ☒ jóvenes
- ☒ personas de mediana edad
- ☐ ancianos

Área usada por hogar

- ☐ < 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
- ☒ > 10,000 ha

Escala

- ☐ pequeña escala
- ☐ escala mediana
- ☒ gran escala

Tenencia de tierra

- ☐ estado
- ☐ compañía
- ☐ comunitaria/ aldea
- ☒ grupal
- ☐ individual, sin título
- ☐ individual, con título

Derechos de uso de tierra

- ☐ acceso abierto (no organizado)
- ☒ comunitarios (organizado)
- ☐ arrendamiento
- ☐ individual

Derechos de uso de agua

- ☐ acceso abierto (no organizado)
- ☒ comunitarios (organizado)
- ☐ arrendamiento
- ☐ individual

Acceso a servicios e infraestructura

- salud
- educación
- asistencia técnica
- empleo (ej. fuera de la granja)
- mercados
- energía
- caminos y transporte
- agua potable y saneamiento
- servicios financieros

- | | | | | | | | | |
|-------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------|
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |
| pobre | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | bueno |

IMPACTO

Impactos socioeconómicos

disponibilidad de agua para ganado

disminuyó ☐ ☐ ☐ ☐ ☐ ☐ ☒ incrementó

Cantidad antes de MST: n/a

Cantidad luego de MST: 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.

calidad de agua para ganado

disminuyó ☐ ☐ ☐ ☐ ☐ ☐ ☒ incrementó

Cantidad antes de MST: n/a

Cantidad luego de MST: n/a

Impactos socioculturales

seguridad alimentaria/ autosuficiencia

disminuyó ☐ ☐ ☐ ☐ ☐ ☐ ☒ mejoró

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

derechos de uso de la tierra/ agua

empeoró ☐ ☐ ☐ ☐ ☐ ☐ ☒ mejoró

Cantidad antes de MST: n/a

Cantidad luego de MST: n/a

Upgrading of traditional management systems of water supply structures.

instituciones comunitarias	se debilitaron		se fortalecieron
mitigación de conflicto	empeoró		mejoró
situación de grupos en desventaja social y económica (género, etáreo, estatus, etnicidad, etc.)	empeoró		mejoró

Impactos ecológicos

cubierta del suelo

disminuyó mejoró

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.

materia orgánica debajo del suelo C	disminuyó		incrementó
cubierta vegetal	disminuyó		incrementó
diversidad vegetal	disminuyó		incrementó
impactos de sequías	incrementó		disminuyó

Impactos fuera del sitio

disponibilidad de agua (aguas subterráneas, manantiales)

disminuyó incrementó

Cantidad antes de MST: n/a
Cantidad luego de MST: n/a
Increased access to groundwater through the rehabilitation of wells and the construction of new wells.

ANÁLISIS COSTO-BENEFICIO

Beneficios comparados con los costos de establecimiento

Ingresos a corto plazo:	muy negativo		muy positivo
Ingresos a largo plazo	muy negativo		muy positivo

Beneficios comparados con costos de mantenimiento

Ingresos a corto plazo:	muy negativo		muy positivo
Ingresos a largo plazo	muy negativo		muy positivo

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.

CAMBIO CLIMÁTICO

Cambio climático gradual

lluvia anual disminuyó	nada bien		muy bien
lluvia estacional disminuyó	nada bien		muy bien

Estación: estación húmeda/ de lluvias

Extremos (desastres) relacionados al clima

sequía	nada bien		muy bien
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ADOPCIÓN Y ADAPTACIÓN

Porcentaje de usuarios de la tierra que adoptaron la Tecnología

	casos individuales / experimentales
	1-10%
	11-50%
	> 50%

De todos quienes adoptaron la Tecnología, ¿cuántos lo hicieron sin recibir incentivos/ pagos materiales?

	0-10%
	11-50%
	51-90%
	91-100%

Número de hogares y/ o área cubierta

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.

¿La tecnología fue modificada recientemente para adaptarse a las condiciones cambiantes?

	Sí
	No

¿A qué condiciones cambiantes?

	cambios climáticos / extremos
	mercados cambiantes
	disponibilidad de mano de obra (ej. debido a migración)

CONCLUSIONES Y LECCIONES APRENDIDAS

Fortalezas: perspectiva del usuario de tierras

- 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.

Fortalezas: punto de vista del compilador o de otra persona recurso clave

- 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.

Debilidades/ desventajas/ riesgos: perspectiva del usuario de tierras cómo sobreponerse

- 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.

Debilidades/ desventajas/ riesgos: punto de vista del compilador o de otra persona recurso clave cómo sobreponerse

- 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.

REFERENCIAS

Compilador

Bonnet Bernard

Editors

Revisado por

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Simone Verzandvoort
Joana Eichenberger

Fecha de la implementación: 18 de enero de 2018

Últimas actualización: 2 de noviembre de 2021

Personas de referencia

BONNET Bernard - Especialista MST

Descripción completa en la base de datos de WOCAT

https://qcat.wocat.net/es/wocat/technologies/view/technologies_3356/

Datos MST vinculados

n.d.

La documentación fue facilitada por

Institución

- n.d.

Proyecto

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

Referencias claves

- Capitalisation des enseignements de la deuxième phase du projet Almy Al Afia, Main document, DHP, Antea/Iram, March 2016: Republic of Chad, General Secretariat, Ministry of Water, Directorate of Pastoral Water Resources
- 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

Vínculos a la información relevante disponible en línea

- Platform on pastoralism in Chad: www.platforme-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>

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