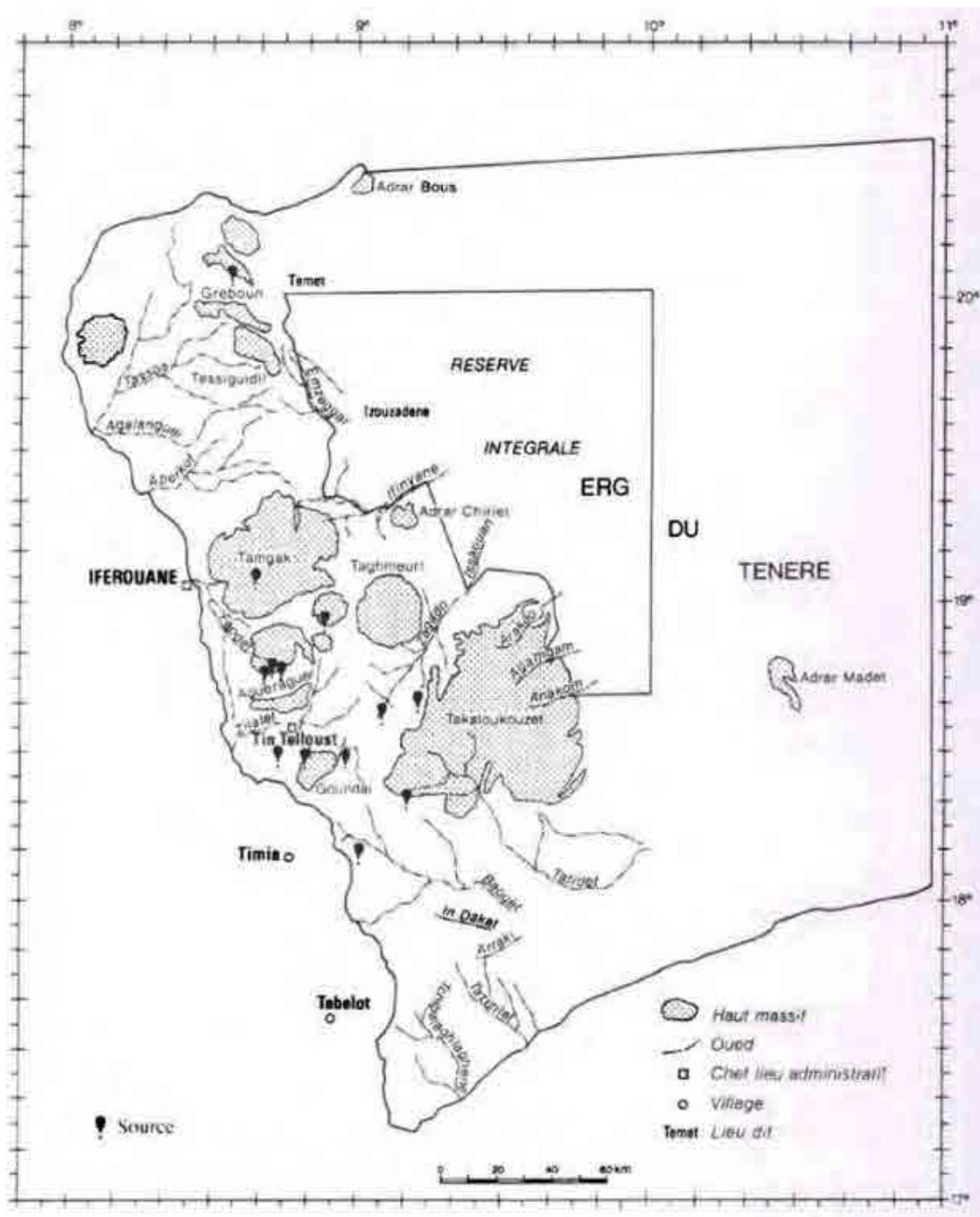


MAPPING THE EMPTY SPACE

**TÉNÉRÉ DESERT,
AÏR MOUNTAINS,
IGHAZER PLAIN,
*AÏR AND TÉNÉRÉ
NATIONAL NATURE
RESERVE, KAWAR
OASES***



BOUNDING BOX

Coordinates System **EPSG:4326**

WGS 84 -- WGS84 - World Geodetic System 1984, used in GPS

<https://epsg.io/4326>

```
POLYGON((  
    7.30  
    20.17,  
    7.30  
    16.80,  
    13.29  
    16.80,  
    13.29  
    20.17,  
    7.30  
    20.17  
))
```

WELL-KNOWN TEXT (WKT) STRING

Download the bounding box (.WKT, *.geojson, *.KML)*
<https://github.com/lsmst/cartorituals/tree/main/mapping-empty-space/desert>

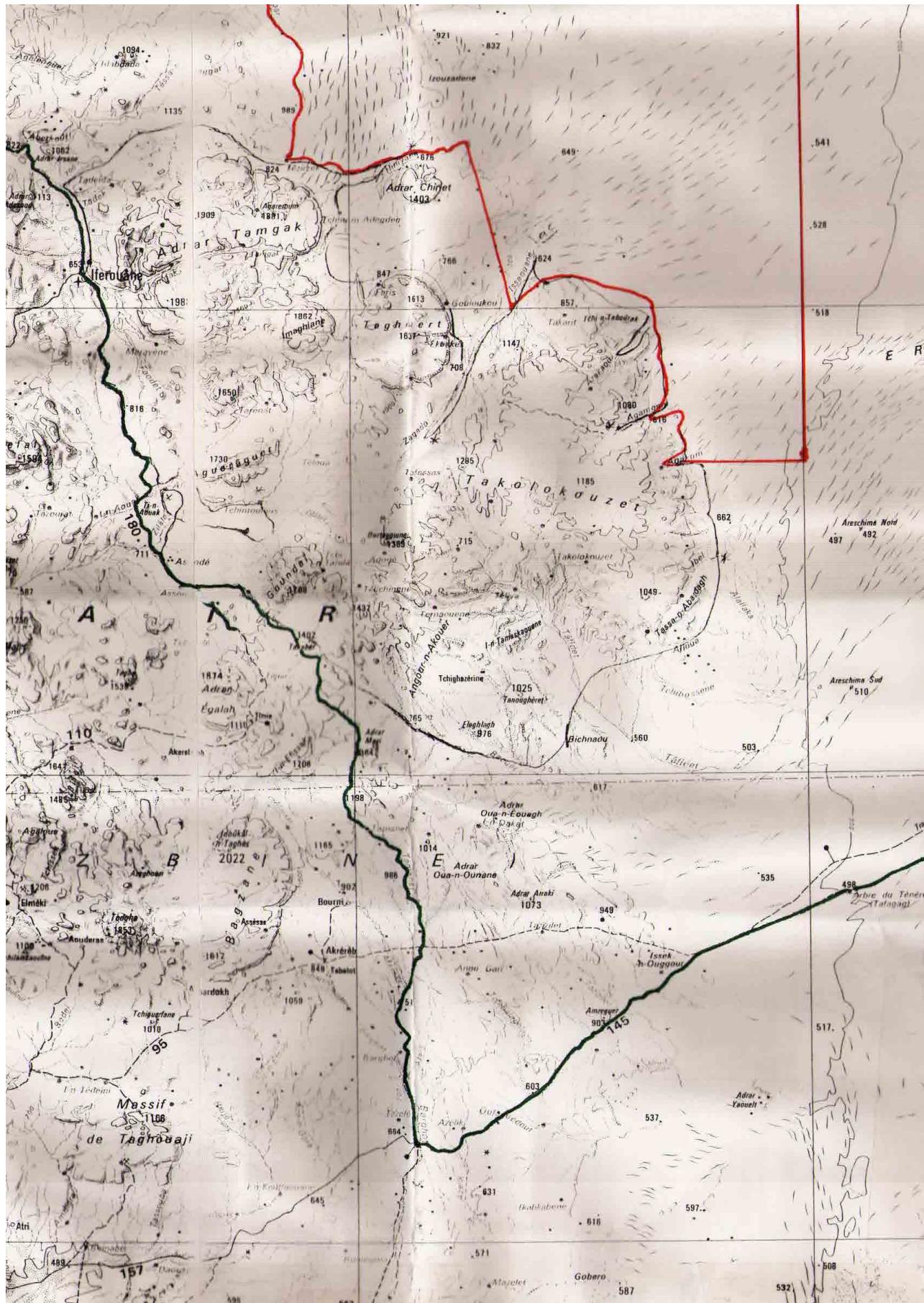


Fig. 5. — Agar (*Moringa crassifolia*), «arbre des génies» dont le tronc porte des inscriptions en caractères tifinagh (Photo E. Bernus).

DESERT, THE EPHEMERAL ISOLATED TREE AS A STONE SIGNPOST FOR THE NOMADS

«le corps d'un enfant souffrant de la fièvre de charbon de bois de l'arbre agar... a une histoire qui recouvre l'enfant doit faire sortir les Kel Esouf (génies) du corps de l'enfant» (Nolaisen, 1961, p. 148). Les feuilles hachées de l'agar ont aussi le corbeau pour abri (refuge) (Maire, 1933, p. 110). Chez les Kel Ahaggar, Foucauld (1951-52, T.1, p. 477-478) signale que les femmes récemment répudiées, qui doivent pendant 3 mois faire retraite (*elloudet*) et qui ne peuvent au cours de cette période, ni se marier, ni participer à l'asri, réunion galante, «l'égalité, la liberté des mœurs», cherchent un agar isolé. Elles demandent alors à cet agar de prendre en charge leur retraite et de se substituer à elles pour accueillir ou gérer cette période de réclusion. Elles s'adressent à l'agar :

An isolated tree in a deserted area is called Amesekni between Tamazeq speakers. From the verb Seken, to show, can also be translated as stone signpost, and serves as landmark to orient nomads despite ephemeral nature, as well as giving name to countless toponyms

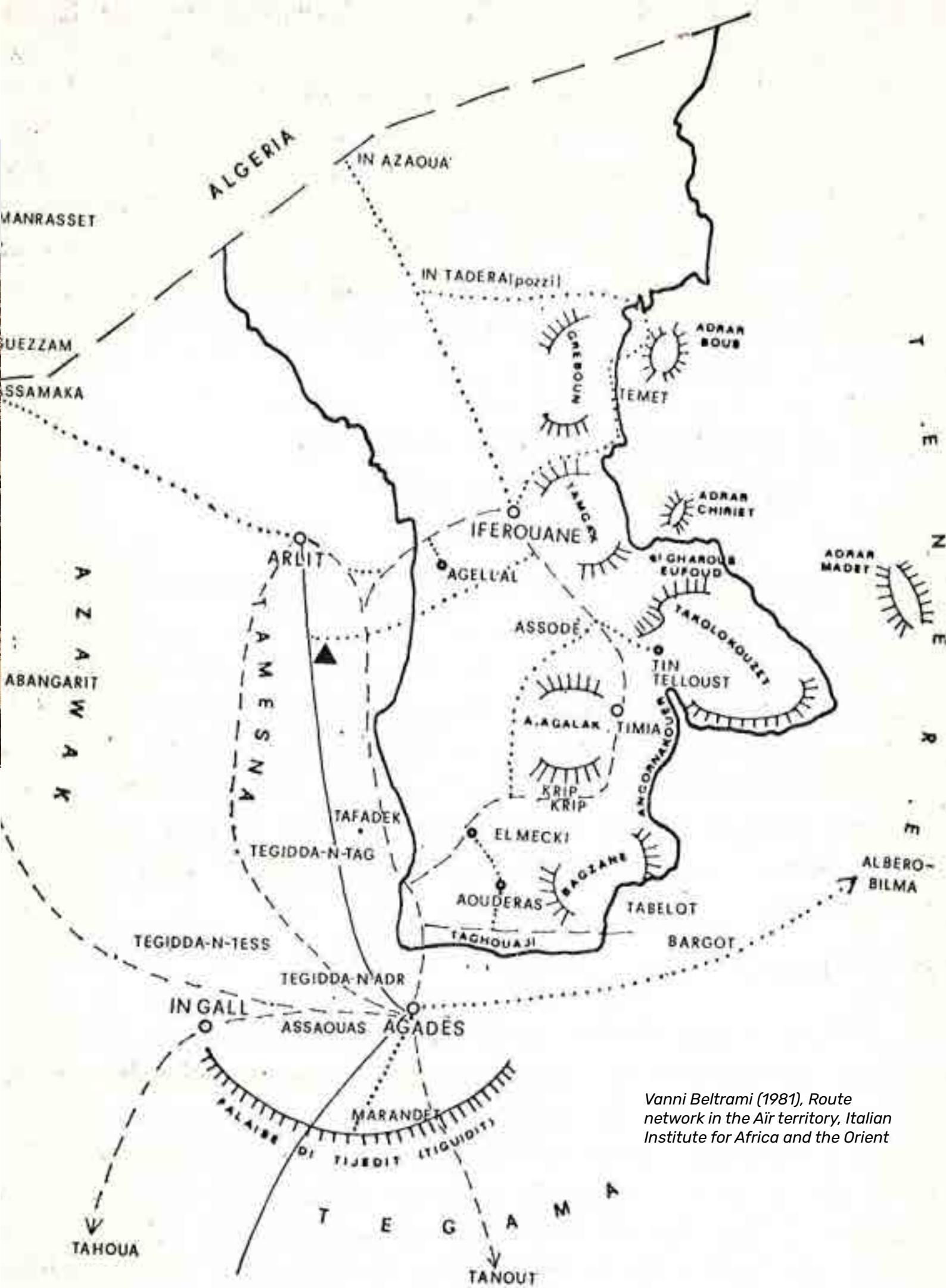


National Geographic Institute of France (1976), Natural Reserve and Integral Reserve of the Air and the Ténéré



19° 0' 9" N , 12° 53' 36" E

The ruins of Dirkou, the oasis city first mentioned in the 11th century under the control of the Kanem king Mai Arku as the centre of the lucrative trans-Saharan salt trade, was largely abandoned in the 19th century



Vanni Beltrami (1981), Route network in the Air territory, Italian Institute for Africa and the Orient

STARTING A COLLECTION AND BIBLIOGRAPHY FOR TÉNÉRÉ DESERT AND AÏR MOUNTAINS (ON BASIC NEEDS AND RIGHTS)

*When you find  it means that
there is data available*

OASIS FARMING: A PALM GROVE THAT, IN THE PRESENCE OF ENOUGH WATER, SUPPORTS TWO STOREYS OF VEGETATION

Oasis in the Bilma department (IRAM)



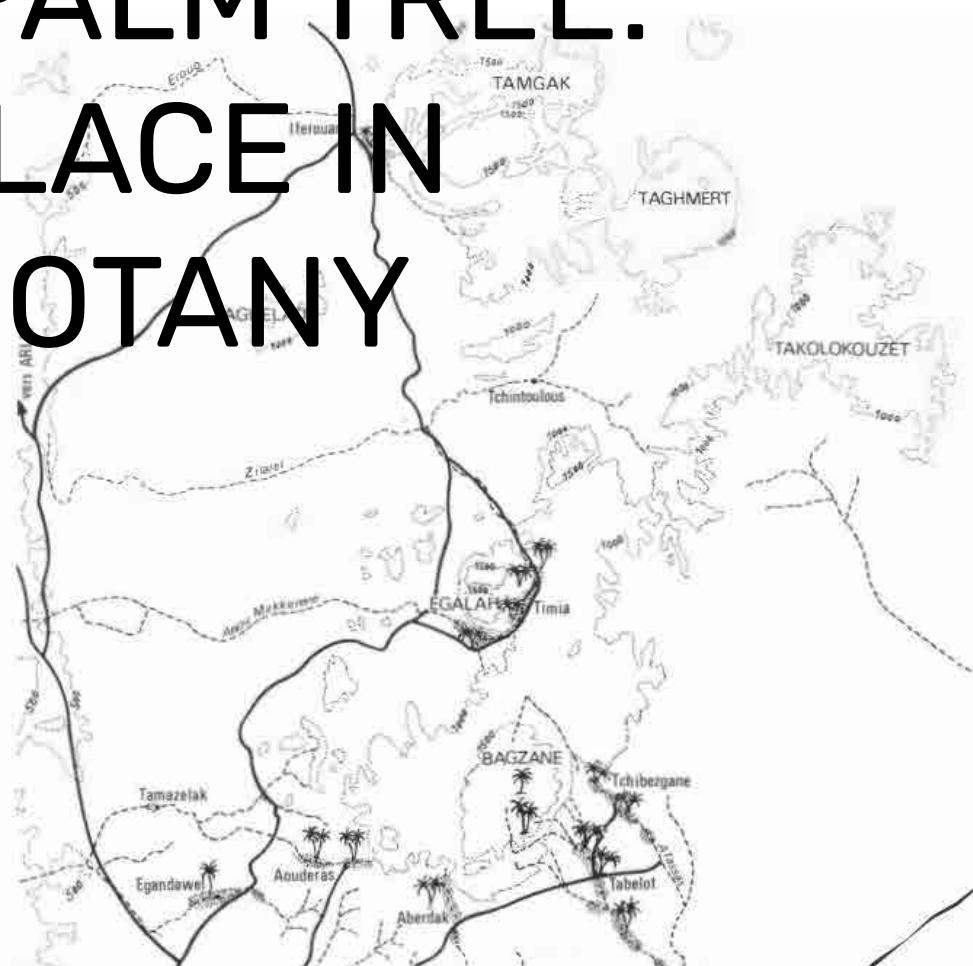
[The arid pastoral and oasis farming system. Key centres for the development of trans-Saharan economies](#)

[Improving Access to Water for Agriculture and Livestock in Niger](#)

AGROECOLOGY OF PHŒNICICULTURE - DATE PALM TREE. THEIR PLACE IN ETHNOBOTANY

The phoeniciculture in the Aïr mountains.

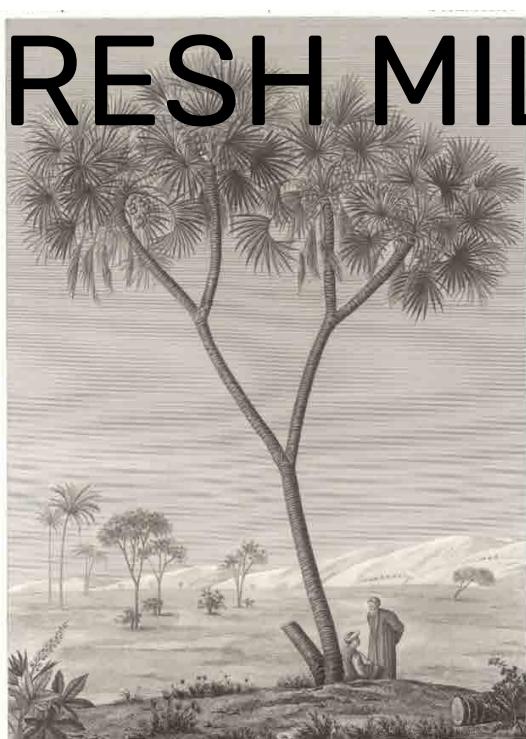
Giraud (1980) *Les palmeraies et la phoeniciculture dans le massif de l'Aïr*



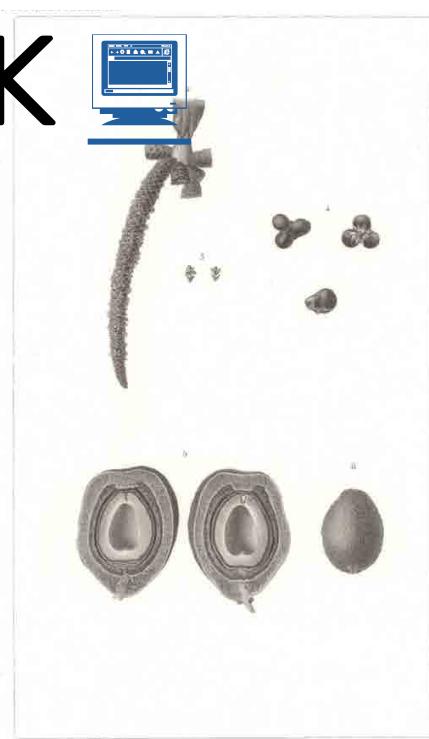
[Girard F \(1980\) Les palmeraies et la phoeniciculture dans les massifs de l'Aïr](#)

[Ali A \(2023\) Palmeraie de l'Aïr: Services écosystémiques et dynamiques des populations](#)

THE HYPHAENE
THEBAICA
PERICARP
BECOMES FLOUR,
THE KERNEL MIXED
WITH FRESH MILK



VUE DU PALMIER DE LA THÉBAÏDE APPELLE DOUM.



DÉTAILS DE LA FRUCTIFICATION.

KNOWN AS AGAR IN TAMASHEQ. THE MAERUA *CRASSIFOLIA*, THE TREE THAT THE CATTLE CHASE



[Bernus E \(1979\) L'arbre et le nomade](#)

[Bernus E \(1985\) "Agar", Encyclopédie berbère](#)

ACACIA TORTILIS. THE SYMBOLIC TREE, FODDER FOR THE ANIMALS



1969 image of the Ténéré Tree, popularly known as the most isolated Acacia tortilis on the planet (17°27'00" N 10°02'24" E, felled in 1973).

NOMADIC, SEMI-NOMADIC, PERMANENT, SEASONAL

GROUPES DE LA BORDURE

SUD-OUEST DE

L'AÏR

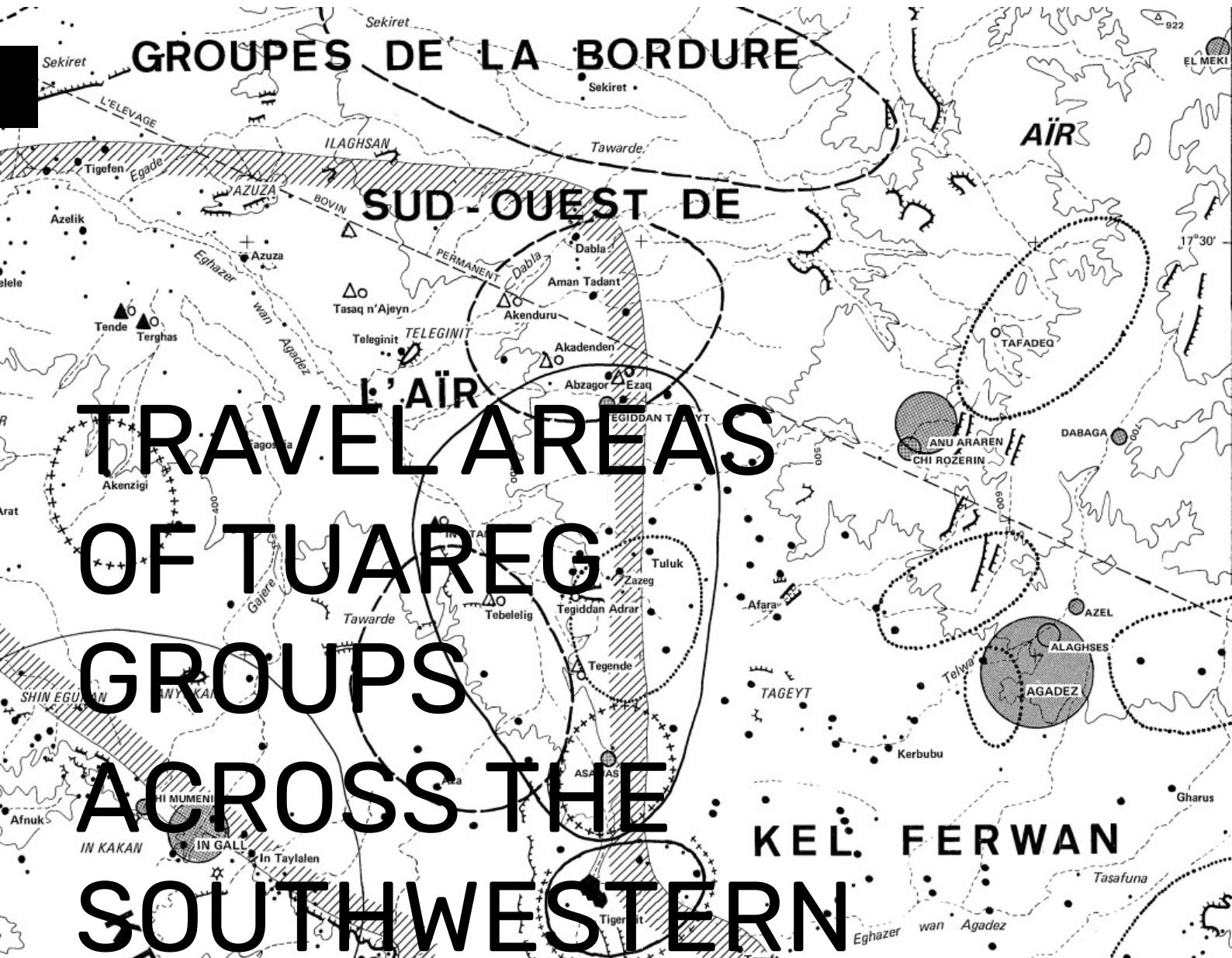
TRAVEL AREAS OF TUAREG GROUPS

ACROSS THE

SOUTHWESTERN

AÏR IN THE DRY SEASON

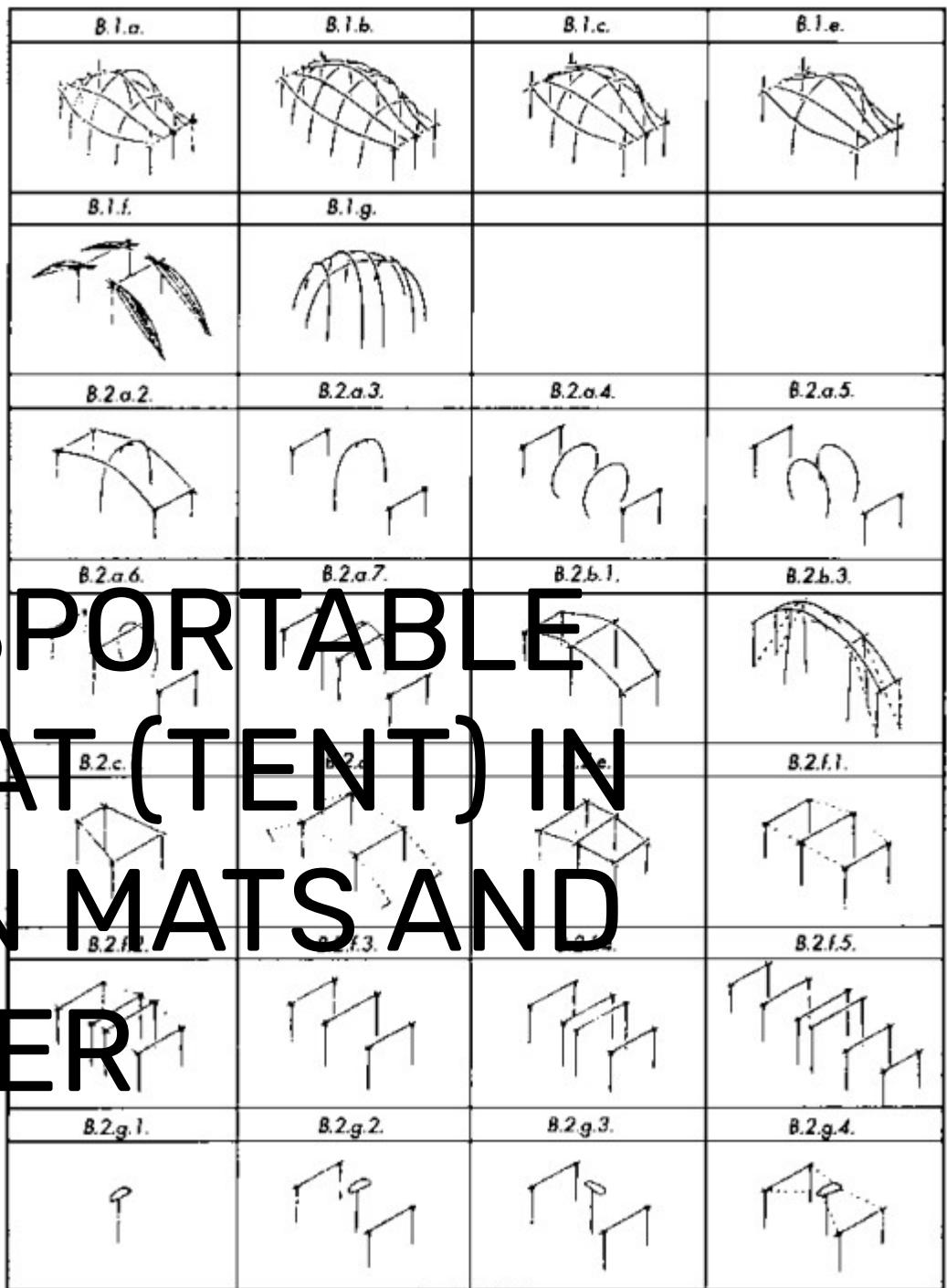
KEL FERWAN



Emergency Archaeological Programme in the In Gall Region (Republic of Niger). Atlas Current human occupation, 1977-81

NOMADIC, SEMI-NOMADIC, PERMANENT, SEASONAL

THE TRANSPORTABLE HABITAT (TENT) IN WOVEN MATS AND LEATHER



NOMADIC, SEMI-NOMADIC, PERMANENT, SEASONAL



GRASS, WATER, SALT, COPPER, AND OTHERS: PASTORAL- NOMADICS' STRATEGIES

*1929 illustration of the saltworks
of Teguida-n-Tisemt*



[\(2013\) 3 Grass, Water, Salt, Copper, and Others: Pastoralists' Territorial Strategies in Central Sudan](#)

[\(1974\) Les Illabakan \(Niger\) : une tribu touarègue sahélienne et son aire de nomadisation](#)

INHABIT

OPEN BUILDINGS. SATELLITE- DETECTED EVIDENCES OF SETTLEMENT



*Building footprint satellite-
detention of the oasis city of
Bilma*



1405, THE SULTANATE OF AÏR.

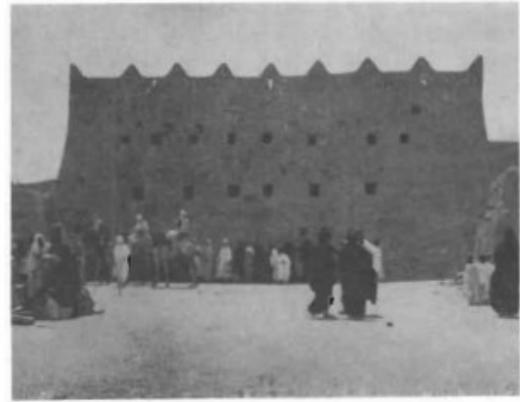


Fig. 4 – Le palais du sultan de l'Aïr à Agadez. Le sultan revient juste d'un court déplacement hors de la ville, et les musiciens, dont 3 tambourinaires à dos de chameau, jouent en son honneur. Les tambourinaires, frappant chacun sur deux tambours, et d'autres musiciens, jouant de divers instruments à vent, accompagnent le sultan quand il quitte son palais. Les tambours du sultan sont différents de celui du chef des Kel Férouan (Fig. 6). Ils sont plus grands et plus hauts, la peau est fixée différemment, et ils sont frappés avec des baguettes.



Johannes N (1982) *Structures politiques et sociales des touaregs de l'Aïr et de l'Ahaggar*

SEDENTARIZATION EVIDENCES: THE MUD ARCHITECTURE



(2014) *Earth Architecture in Niger between past and future*

Introduction to the Themes of Sedentarisation, Urbanisation and State Formation in the Ancient Sahara and Beyond

THE HYPHAENE *THEBAICA* TRUNK SERVES AS BEAMS TO SHELTERS

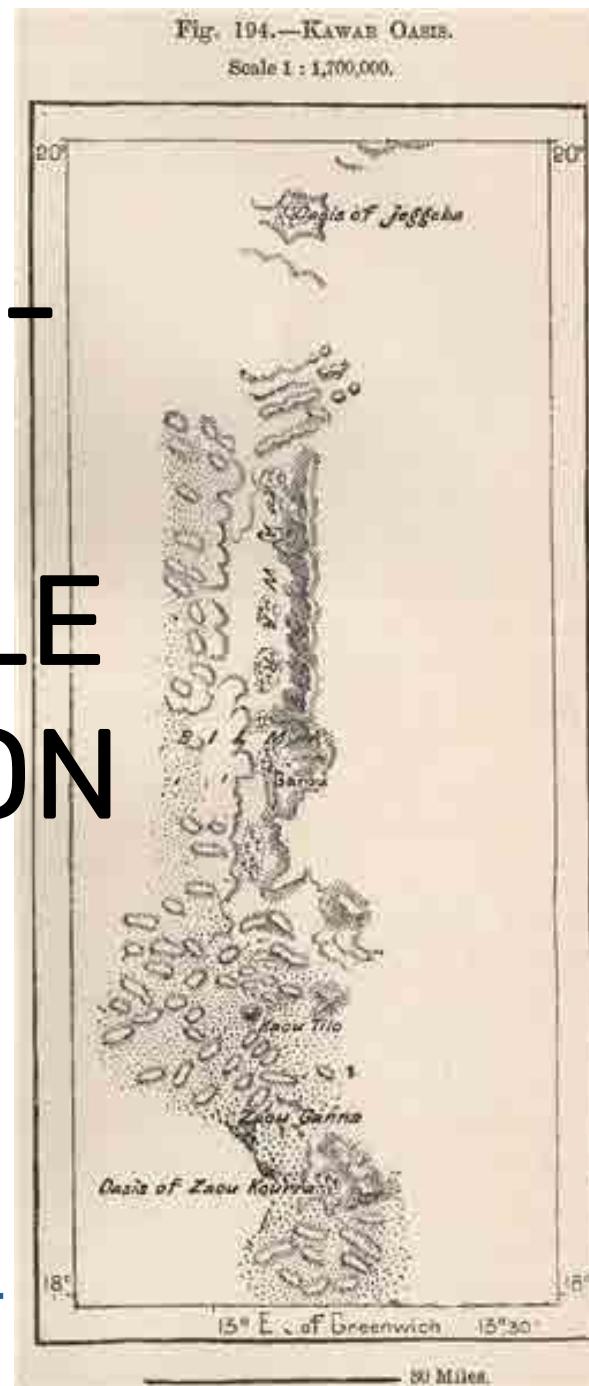


Photographie 37. Pailleto en ruche à Iferouane. (cliché P. Turley)



Reclus E (1885) Kawar Oasis. Wood-engraved map

THE OASIS, AN ENTIRELY MAN- MADE SITE. A PRIME EXAMPLE OF INTERACTION BETWEEN HUMANS AND THE DESERT



[ATLAS of Saharan and Arabian Oases. Definition and typology](#)

[Accès à l'eau au Niger : Quelles ressources pour quels besoins ?](#)

ACCESS TO FRESH/DRINKING WATER

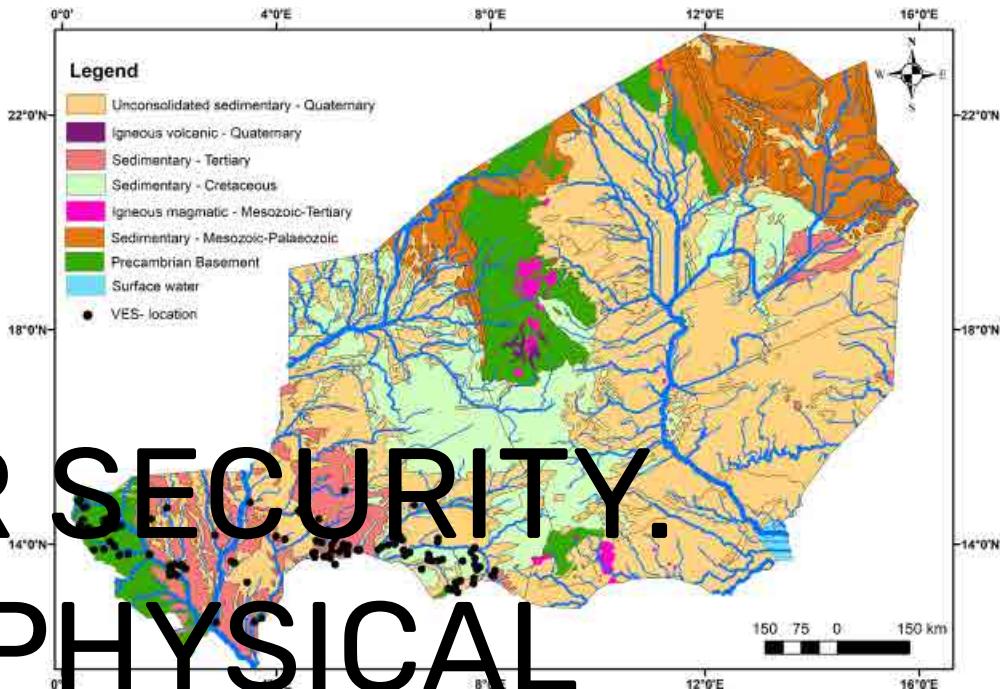


DIGGING TO FIND THE WATER TABLE

Animal-drawn wells (Tekarkari) in the Telwa valley, southern Aïr



[Agriculture Water Management Investments: Shallow wells and boreholes
\(15m\) Biophysical Suitability](#)



WATER SECURITY. A GEOPHYSICAL SURVEY - VERTICAL ELECTRICAL SOUNDING- TO ESTIMATE GROUNDWATER VOLUME



[Electrical imaging to decode the potential aquifer locations for water security in semiarid Niger, Africa](#)

CO-OPERATION, CO-EXISTENCE, INTER-SPECIES CONFLICT

THE RED LIST. ENDANGERED SPECIES POPULATIONS



Torgos tracheliotos, *Lappet-faced Vulture*, Classified as Endangered by IUCN Red List



HARSH ECOLOGICAL CONDITIONS DO NOT MEAN ABSENCES OF WILDLIFE



Photographie 26. Herde de Mouflons à manchettes (*Ammotragus lervia*) dans l'un des massifs montagneux de l'Aïr. (cliché J.E. Newby)

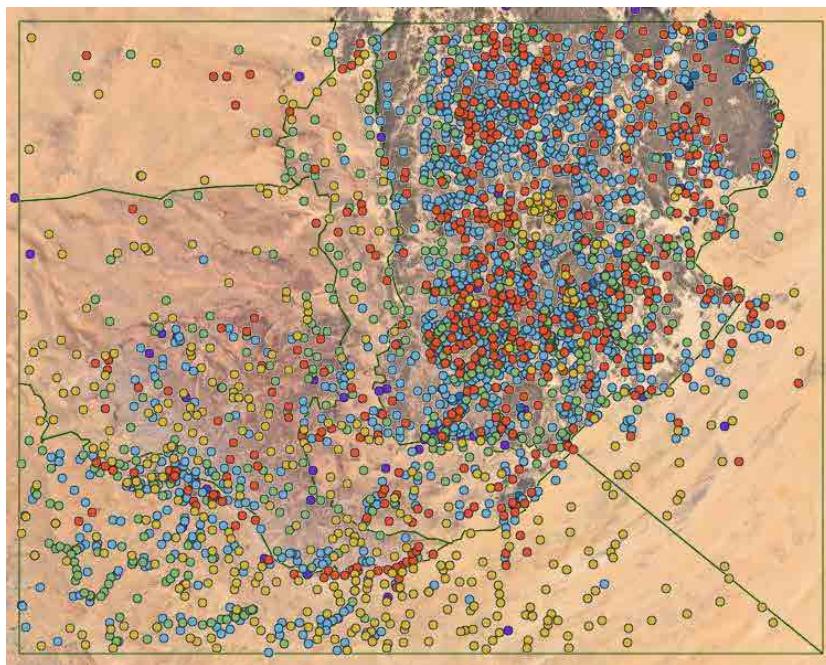


BOUNDARIES OF HISTORICAL, LINGUISTIC OR CULTURAL AREAS OF INFLUENCE: SONGHAY, HAUSA, BORNOUANE, TOUARÈGUE



Emergency Archaeological Programme in the In Gall Region (Republic of Niger). Geographical and historical overview, 1977-81

TOPOONYMY IN IGHAZER-AÏR. A LINGUISTIC LANDSCAPE BUILT OF OVER 2,500 PLACE NAMES



AZĞEN, AZAKKA OR MUDA : A UNIT OF CAPACITY FOR FOOD PRODUCTS



1. *Moïda* de bois renforcé d'un lacage de peau
pour servir à la vente et au stockage des grains.

2. Vente de mil sur le marché de Tamanrasset.
La mesure ci-dessus est une boîte de fer au fond
arrondi qui vaut un *moïda*.



[Gast M \(1963\), Mesures de capacités et de poids en Ahaggar](#)

[Gast M \(2010\) "Azğen", Encyclopédie berbère](#)

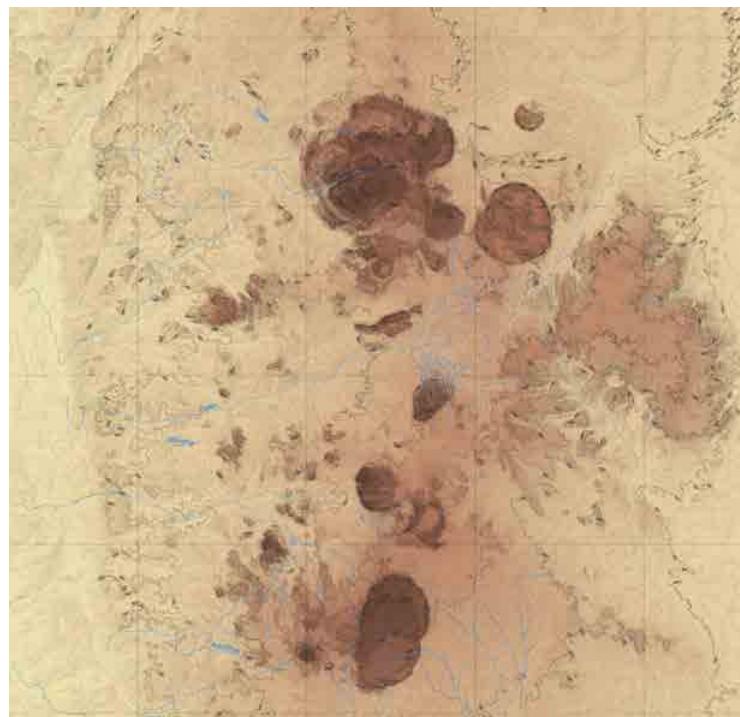
**MAERUA
CRASSIFOLIA**  AND
ACACIA TORTILIS
, MAJOR IN THE
PHARMACOPOEIA.
TREATING BLOWS
AND WOUNDS (ALSO
FOR ANIMALS), OR
HEADACHES



SECTIONS

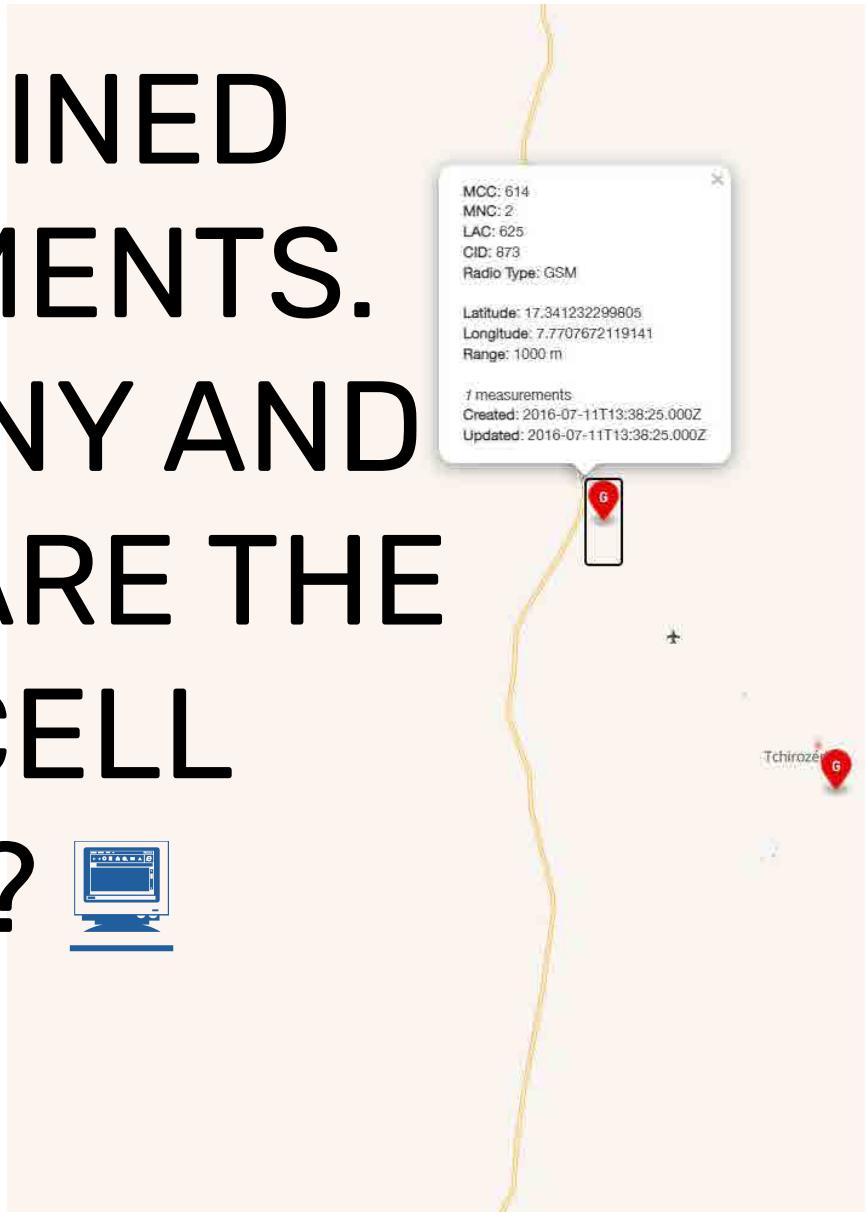
ELEVATION MODEL

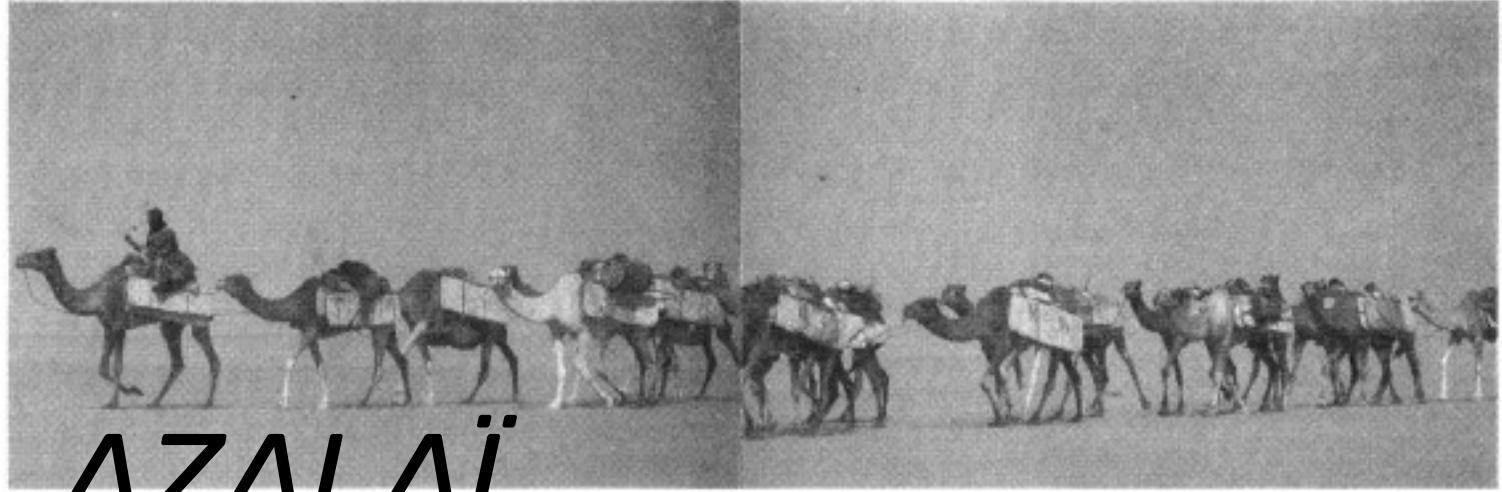
90M  30M 



*Topographic map of the
Air massif*

■ INTERTWINED SETTLEMENTS. HOW MANY AND WHERE ARE THE PHONE CELL TOWERS?





AZALAI, THE SALT CARAVANS. *TAGHLAMT,* THE CARAVAN FROM THE AÏR TO THE KAWAR

Each year, caravans load the millet harvested in the southern regions in Agadez and transport it to Bilma. On the way back, the salt extracted from the Bilma salt pans is transported to Agadez on camels.



[Chatelard A \(1990\) "Azalai", Encyclopédie berbère](#)

[Skolle J \(1956\), Azalai, Harper & Brothers](#)

[Le négoce caravanier au Sahara central : histoire, évolution des pratiques et enjeux chez les Touaregs Kel Aïr \(Niger\)](#)

DISAPPEARING CARAVAN ROUTES TURNING INTO MIGRATORY ROUTES. CROSSING INTO CONFLICT AREAS WITH THE FEAR OF BEING STRANDED IN THE DESERT



Élodie Apard picture of a broken down truck between Arlit and Assamaka (Algeria-Niger border)



[Voies commerciales et routes de l'exode : évolution des pratiques de voyage au Niger](#)

[Un désert cosmopolite. Migrations de transit dans la région d'Agadez](#)

FROM TAKELOKOZAT TO TABLELOT. THE NEW CARAVAN ROUTE, THE GOLD ROUTE

Dromedary caravan lowering bags of ore from the Takelekozat veins to be shipped by truck to a processing centre in Tabelot



A COMPLEX SYSTEM OF PASTORAL RULES AND CUSTOMS ON LAND RIGHTS OVERLAID BY COLONIAL AUTHORITY



[*Bulletin des zones arides: peuples, politiques, programmes \(2001\).
L'eau : la clé de la gestion des ressources pastorales*](#)

[*Thébaud B, Vogt G, Vogt K \(2006\). Droits d'accès à l'eau et foncier
pastoral : le cas du Niger, in Cotula, Droits fonciers et accès à l'eau
au Sahel : défis et perspectives pour l'agriculture et l'élevage, IIED*](#)

NUCLEAR COLONIALISM AND SPOILIATION OF AGRO- PASTORAL LAND BY MINING COMPANIES

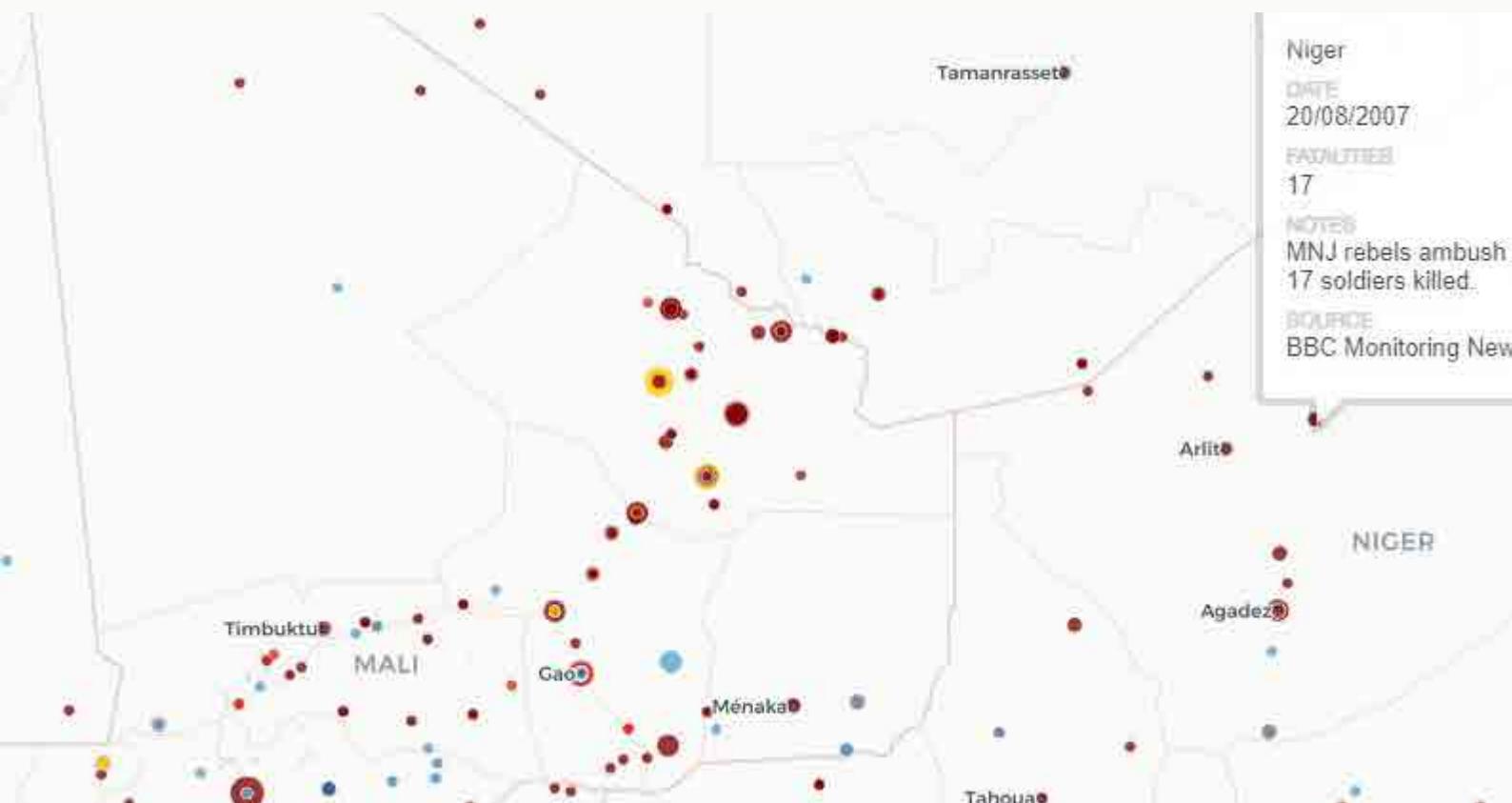


*Status of uranium mining licences
in Niger in 1968. Mineral plan of the
Republic of Niger (1980)*

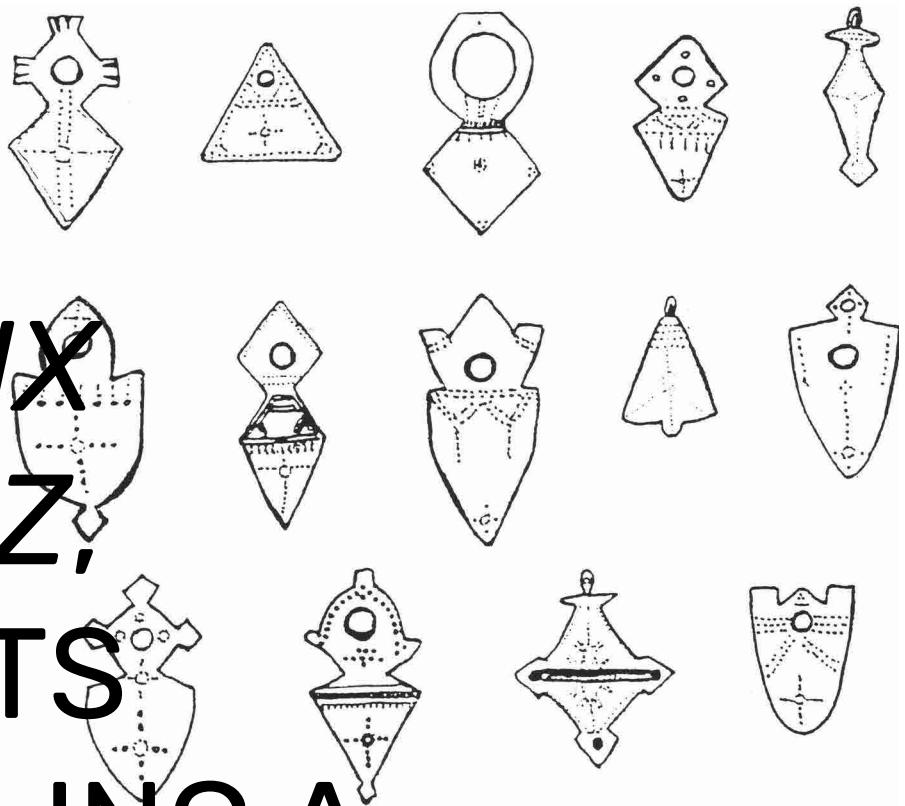


SUMMARY			EVENTS DETAILS					
NIGER AGADEZ			GADEZ					
Date	Type	Sub Type	Date	Type	Sub Type			
06/04/2022	Violence aga...	Attack	2022	Battles	Armed clash			
ID	LOCATION	FATALITIES		LOCATION	FATALITIES			
9104527	Arbre du Tenere	2		Bilma	0			
ACTORS								
Unidentified Armed Group (Niger)			National Guard					
NOTES								
On 7 April 2022, Unidentified gunmen ambushed transport vehicles carrying off-duty soldiers in the area of Puits Espoir (Arbre du Tenere), Tchirozérine, Agadez between Bilma and Agadez. Two soldiers were killed and four wounded including one critically.								
In October 2022, national guards and an unidentified group exchanged gunfire in the area of Bilma (Bilma, Niger). National guards arrested three individuals, and seized firearms, ammunition, and other items. There were no injuries.								

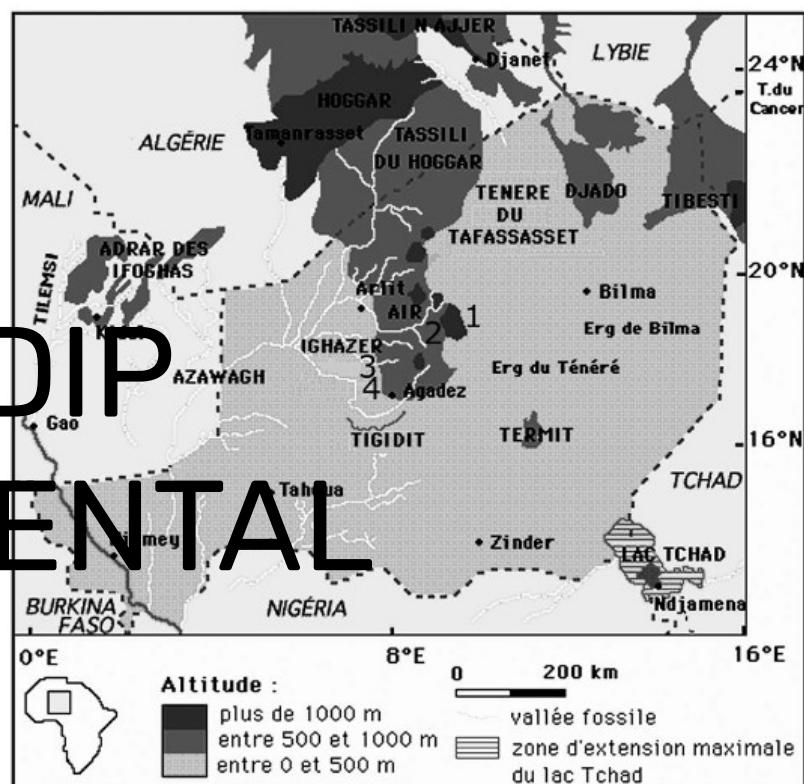
CONFLICT, POLITICAL VIOLENCE AND PROTEST



***LES CROIX
D'AGADEZ,
PENDANTS
RESEMBLING A
CROSS (*TANAILT*),
OR A PLAQUE,
OR A SHIELD
(*TALHAKIM*)***



“CATTLE CULT”, A SOCIAL RESPONSE TO THE RADIP ENVIRONMENTAL CHANGE

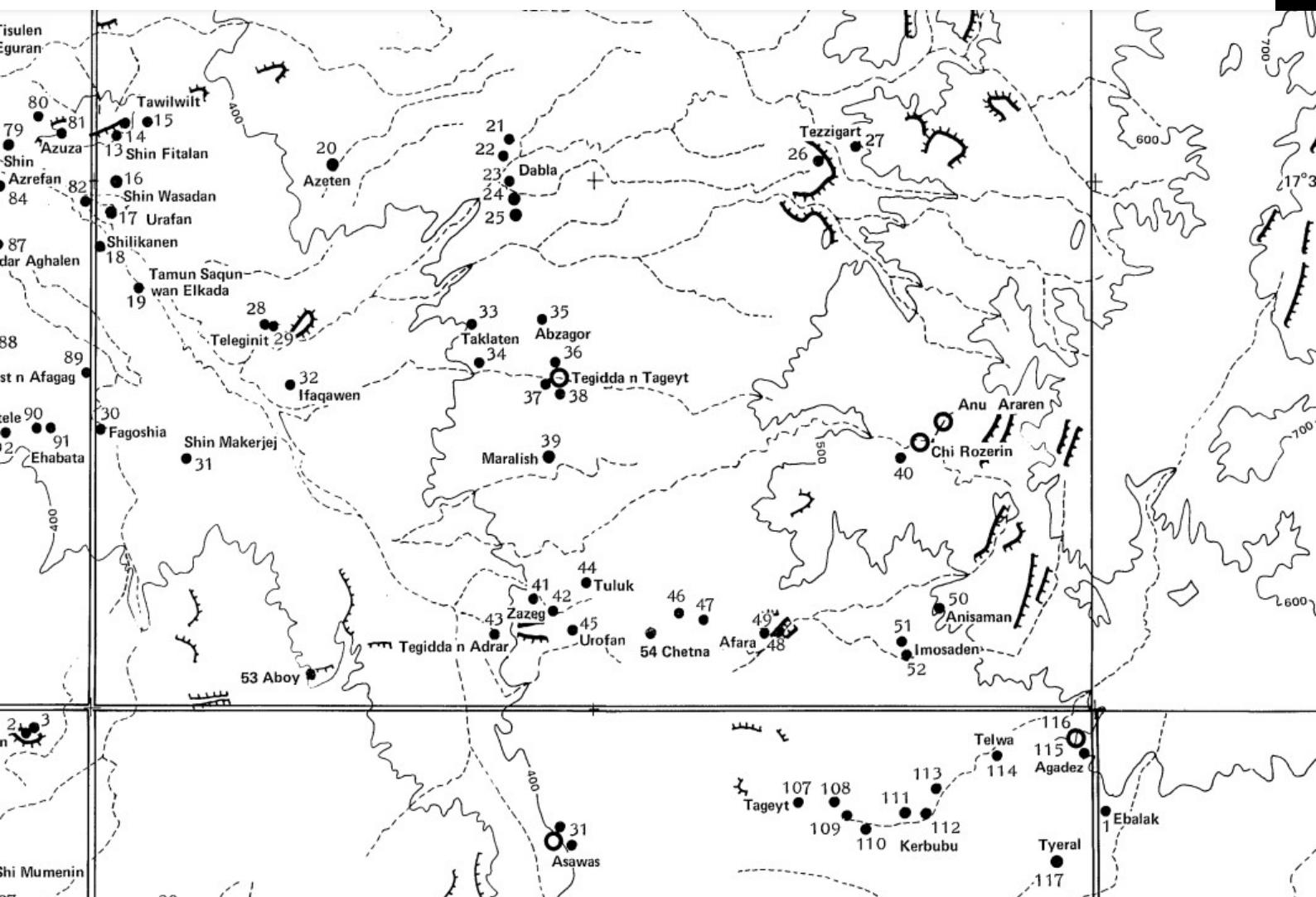


*Map of main sites in the Air mountains with stone features containing livestock offering:
Adrar Bous, Talak, Chin Tafidet, In Tuduf*

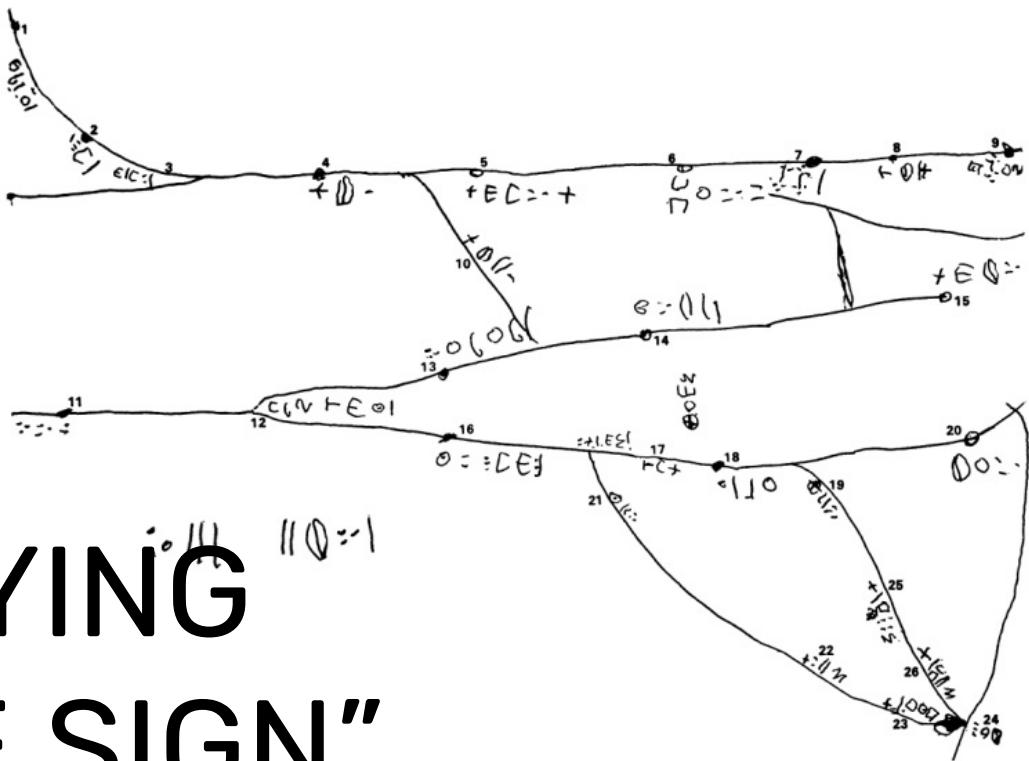


ARCHAEOLOGICAL SITES IDENTIFIED IN THE SOUTHERN

AïR



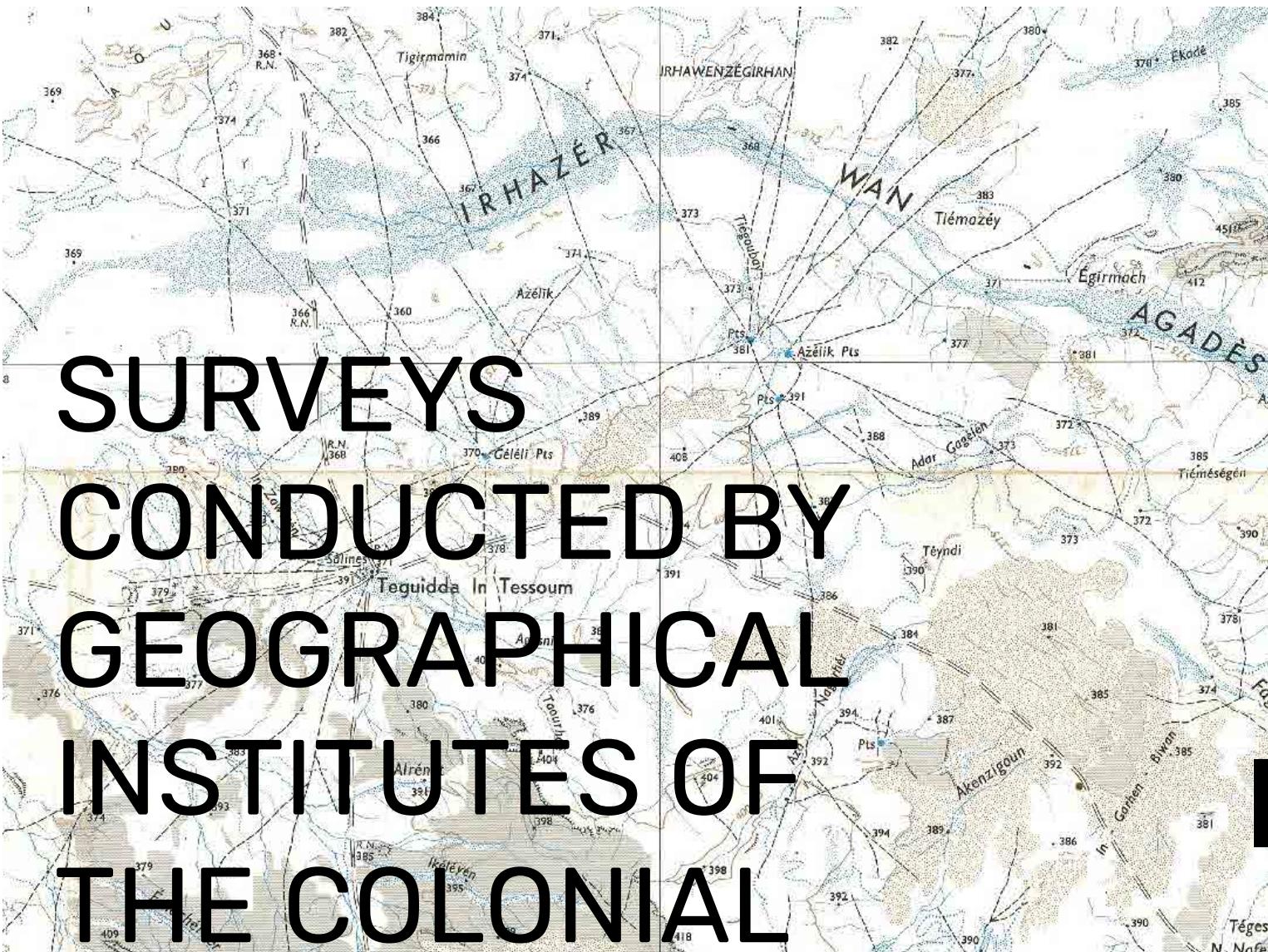
TREES SIGNIFYING “STONE SIGN”. ■ HOW A TREE IS REPRESENTED ON A 1/1,000,000 METRIC SCALE MAP



Refers to the mental map that nomads have for orientation: it represents the pattern of river valleys crossed in the dry season



MOBILITY, ORIENTATION SYSTEMS



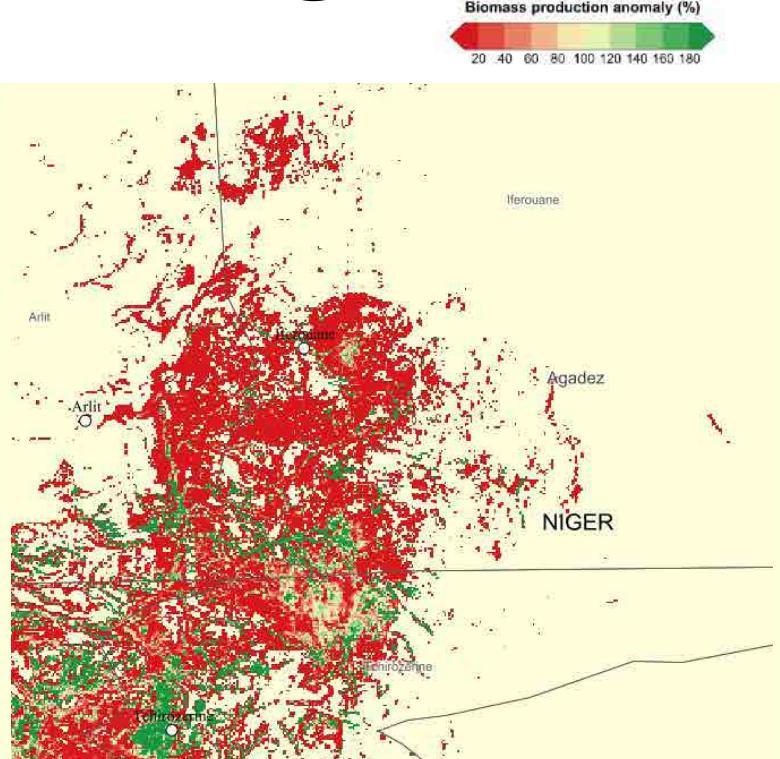
SURVEYS CONDUCTED BY GEOGRAPHICAL INSTITUTES OF THE COLONIAL AUTHORITIES:

ELMEKI 

TEGUIDDA-N-
TESSOUMT 

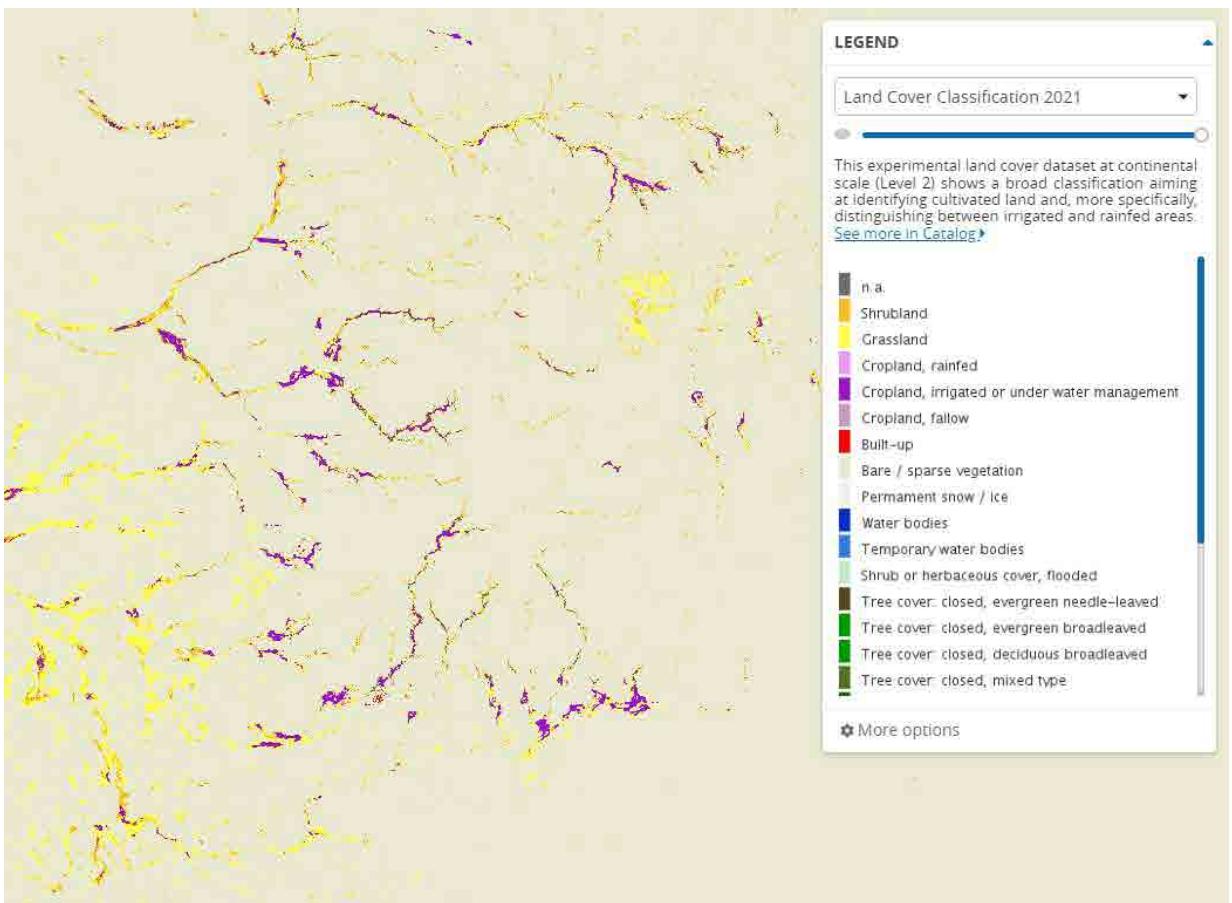
AGADEZ 

20 YEARS OF BIOMASS SURVEILLANCE ■ : ANNUAL PRODUCTION AND ANOMALIES

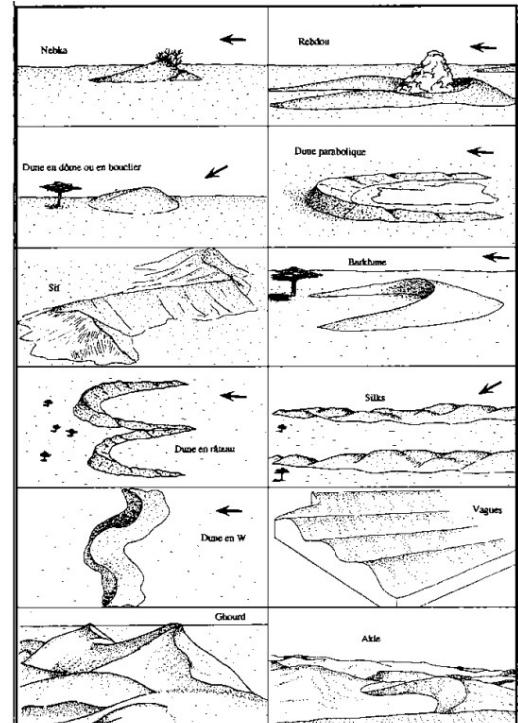


SEASONAL CHANGES IN THE LANDSCAPE

WaPOR 2.1 LAND COVER CLASSIFICATION 2009-2021

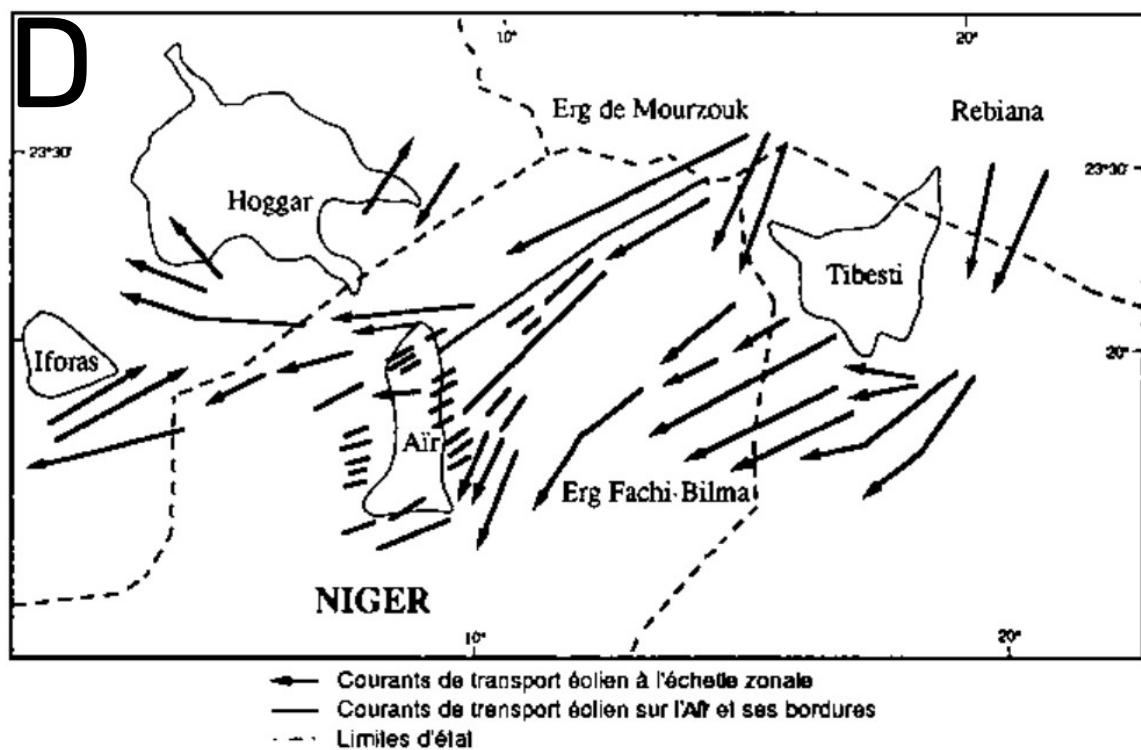


SEASONAL CHANGES IN THE LANDSCAPE

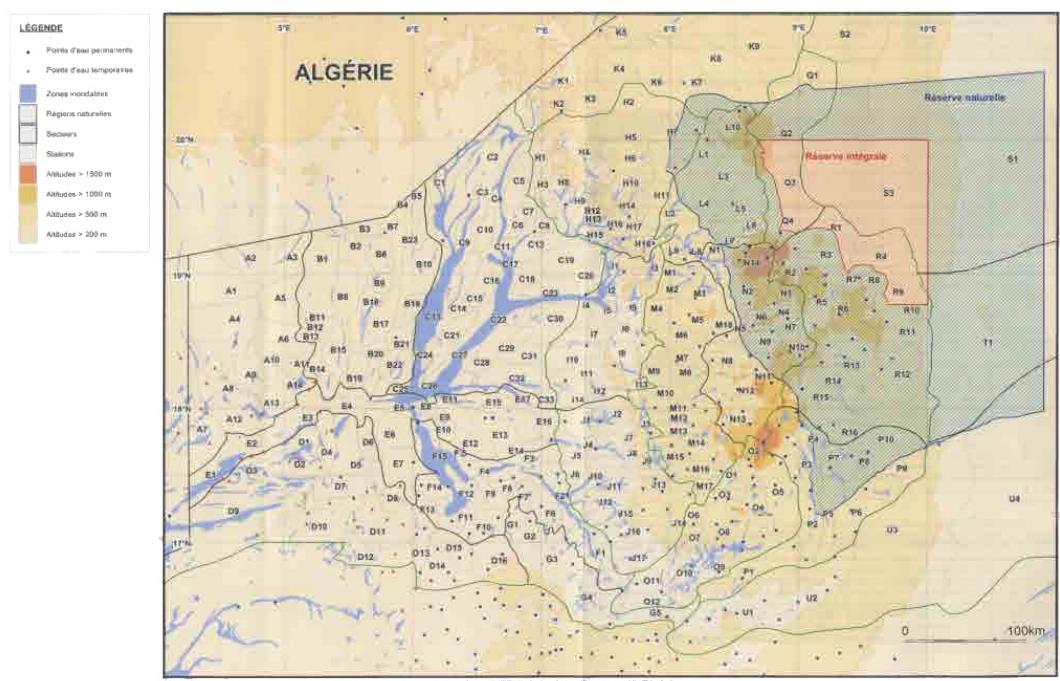


AN ESSENTIAL AGENT TRANSFORMING THE LANDSCAPE,

■ **WIND**

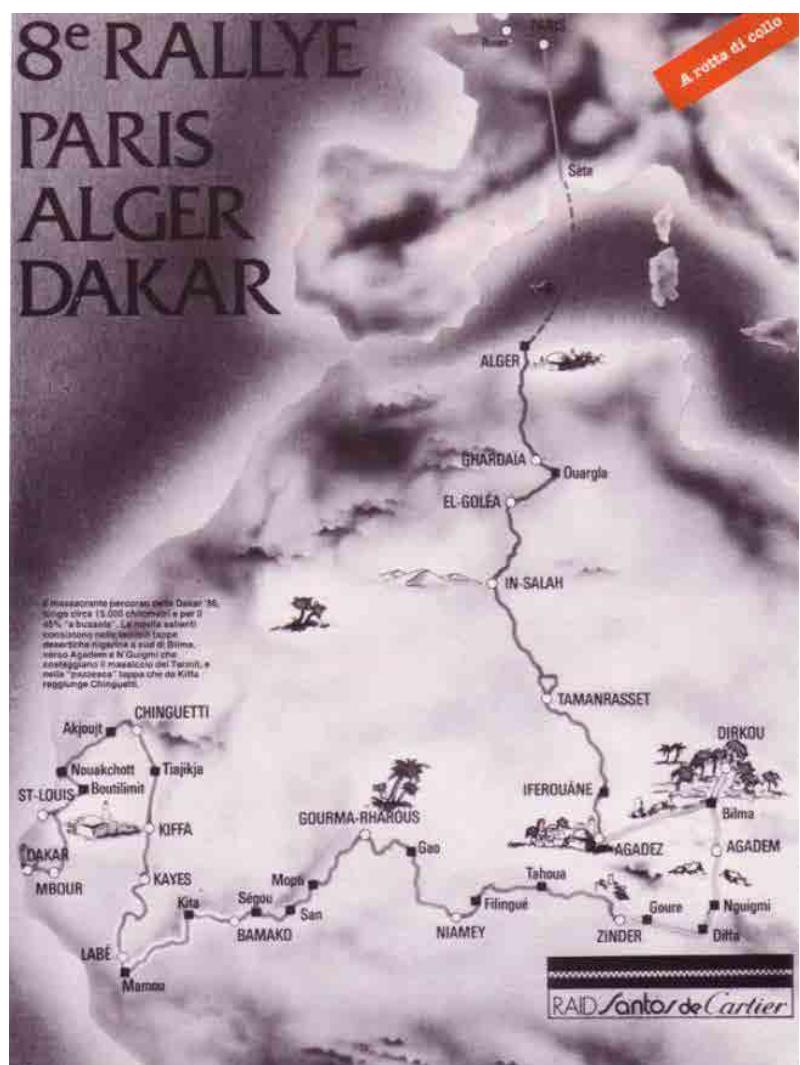


ECOLOGICAL UNITS IN PHYTOGEOGRAPHY



LIFESTYLE AND WELL-BEING

ACHIEVING WORLDWIDE NOTORIETY WITH THE PARIS-DAKAR RALLY



LIFESTYLE AND WELL-BEING



Dates: September 18 – 30, 2023
(The dates can be shifted 1 week earlier, that is for September 11 — 23, 2023, due to probable change of the dates of Cure Salee festival)

Duration: 13 days / 12 nights

Number of participants: 7 – 12

Cost per person:

- 3 490 EUR subject to 12 participants, or
- 3 650 EUR subject to 9 — 11 participants or
- 3 890 EUR subject to 7 — 8 participants, based on double accommodation.

10% early booking discount (in case you book before April 18, 2023)

Everything is included (also domestic flight from Niamey to Agadez, armed security escort), except for:

- International flight to Niamey roundtrip
- Niger visa (we assist to arrange "visa on arrival" at 110 EUR incl. visa fee and pre-visa)
- international medical insurance
- dinners in Niamey and Agadez.

Estimated cost of international flight Paris – Niamey – Paris: EUR 550 – 1100 (to be bought on your own. We consult you).

Estimated cost of international flight Istanbul – Niamey – Istanbul: EUR 900 – 1000 (to be bought on your own. We consult you).

Estimated cost of international flight Moscow – Niamey – Moscow: EUR 1500 – 1700 (to be bought on your own. We consult you).



LIFESTYLE AND WELL-BEING

DATES & PRICES

19/02/2023 - 05/03/2023
22/10/2023 - 05/11/2023
02/12/2023 - 16/12/2023

3790 £ Per Person for 11-12 person group

It is possible to extend the stay up to 17 days (Agadez, Sultanate of Dosso and Niamey sightseeing with a cruise on the Niger River) – please contact the office.

DAY 3/4 | Agadez – Air Massif – Timia

After breakfast, we will start our Saharan expedition. At the beginning, we will head towards the Air Massif. We will stop in one of the most beautiful oases in this part of the Sahara – Auderas and Timia. Then we will set off for the heart of the Air Massif where we will meet the inhabitants of this region – the Tuareg people – and we will see the extraordinary rock formations built of Precambrian rocks and materials from long-extinct volcanoes. In the Timia oasis we will see palm groves, waterfalls and remainders of former glory of this ancient crossing of trade routes. We will sleep in tents

B.L.D.

MAPPING THE EMPTY SPACE

**DESERT,
DRAW THE BOUNDING
BOX ON A MAP**

**DESERT,
BUILD YOUR OWN
MENTAL IMAGE
OF THE EMPTY
PLACE USING
SATELLITE IMAGES
AND CRITICALLY
ANALYSING THE
DOCUMENTATION IN
THE DOSSIER**

MAPPING THE EMPTY SPACE

**DESERT,
PLOT A JOURNEY
THAT ALLOWS YOU
TO TELL A STORY/
STORIES**

MAPPING THE EMPTY SPACE

**DESERT,
PUBLISH THE TRACK
TO THE WEB USING
MAPBOX STUDIO**

MAPPING THE EMPTY SPACE

**DESERT,
CREATE A
PRINTABLE
SYNTHETIC MAP
WHERE YOU TELL
AND REPRESENT
THE STORY/
STORIES ALONG
YOUR JOURNEY**

DESERT,
DON'T FORGET THE
RITUAL AND WHO
TAKES PART IN IT.
THAT'S WHY YOUR MAP
IS WRONG. *THE MAP IS
NOT THE TERRITORY.*
BUT BY THEN, YOU
WILL HAVE LEARNED A
PROCESS.