



Monitoring environmental-related transhumance patterns and assessing the risk for population displacement

Monitoring Umwelt-bedingter Muster der Transhumanz und Risikoanalyse von Bevölkerungsvertreibung



Funded by



Neue Perspektiven der Erdbeobachtung

2. Symposium zur angewandten Satellitenerdbeobachtung
12. November 2019, Köln

Transhumanz (Wander-Weidewirtschaft)

- Saisonale Migrationsbewegungen mit Nutztierhaltung
- Wichtiges agrar-ökologisches Produktionssystem
- Ermöglicht den Hirten sich flexibel auf Schwankungen der verfügbaren Ressourcen einzustellen (gewisse Resilienz gegenüber klimatischen Ereignissen wie Dürren)
- Steigende Häufigkeit von klimatischen Extremereignissen und Ausweitung des Ackerbaus, führt zu zunehmender Konkurrenz um Ressourcen (Subsistenzbauern vs. Pastoralisten)
- Konflikte, teilweise gewaltsam, im Zusammenhang mit der Verfügbarkeit von natürlichen Ressourcen, haben an Anzahl und Schwere zugenommen
- Können zu Vertreibungen mancher Gesellschaften und Bevölkerungsgruppen führen



Quelle: crisisgroup.org

Gewaltsame Konflikte und Bevölkerungsvertreibung



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August 6, 2018 5:02PM EDT

Farmer-Herder Conflicts on the Rise in Africa

Published in Inter Press Service (IPS) News Agency

Julliana Nnoko-Mewani
Researcher, Women's Rights Division
jnnokom@hrw.org



TheNEWS

Nation Politics Sports Business Opinion Arts Life Education Video Internation

Fulani national leader: Why our herdsmen carry AK47s...

Monday, May 2, 2016 1:58 pm



Baba Othman Ngelzama, the National Secretary, Myetti Allah Cattle Breeders Association

Baba Othman Ngelzama, the National Secretary, Myetti Allah Cattle Breeders Association, otherwise known as Fulani herdsmen explains why Fulani herdsmen carry gun, origin of their clash with farmers and other security issues. Here is the full interview aired on Channels Television:

I want to believe that you have seen part of the Grazing Bills and the question is, do you think that would solve the problem?

Firstly before I say anything, let me use this opportunity to condemn in totality what has taken place in Enugu. It is extremely shocking and I want to sympathise with the government and people of Enugu State irrespective of who has done it. People have lost their lives. It is

- MORE READING
- June 28, 2 Nigeria Violent
 - January 21 Zimbabwe Project

INSIGHTS

Herders vs Farmers: Resolving deadly conflict in the Sahel and West Africa

April 16, 2018

Ousman Tall, Sahel and West Africa Club (SWAC/OECD)



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THE CONVERSATION

Academic rigour, journalistic flair

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Why clashes are on the rise between farmers and herdsmen in the Sahel

May 2, 2018 1:56pm BST



Pastoralists on a dry plain in central Mali, one of the seven Sahel countries hit by a wave of deadly attacks. ©IRIN, Reuters

As fireworks were lighting up the skies to usher in the New Year across the world, gunfire was echoing out in Nigeria's Benue State. On this night alone, 73 people were killed and hundreds were injured after herdsmen unleashed terror in two local government areas mostly populated by farmers.

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SEARCH

The New Humanitarian (formerly IRIN News)

Aid and Policy Conflict Environment and Disasters Migration

News Human Rights 22 December 2009

Farmer-pastoralists' clash leaves 32 dead

READ



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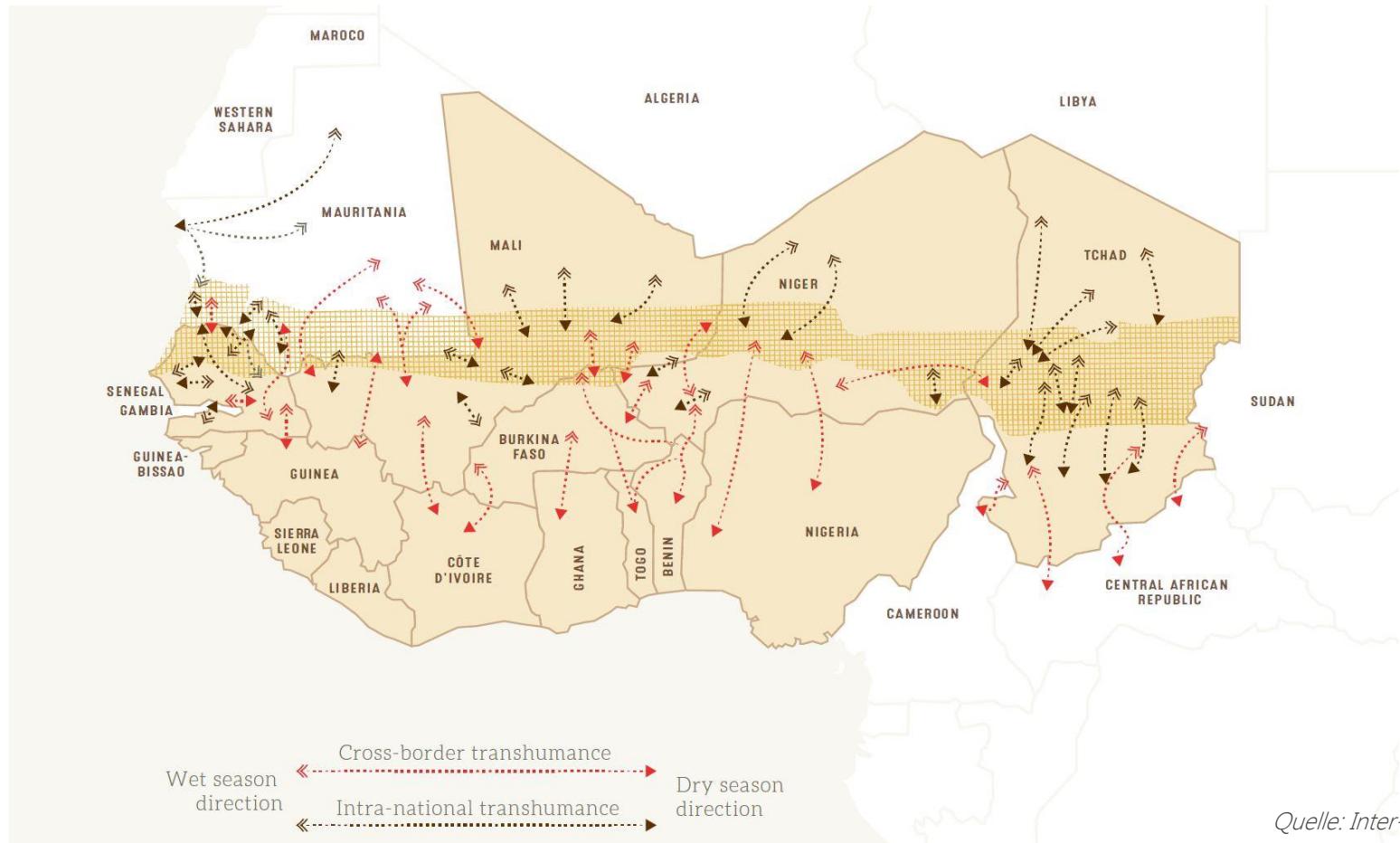
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A tense calm has been restored following clashes between pastoralists and farmers in central Nigeria's Nasarawa State which left 32 people dead, scores of houses burned, and several farms destroyed, officials told IRIN.



Transhumanz (Wander-Weidewirtschaft)



Quelle: Inter-Reseaux, 2017



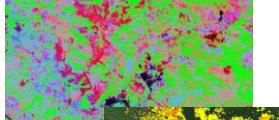
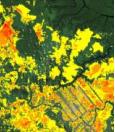
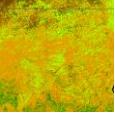
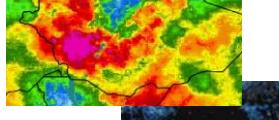
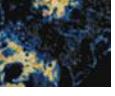
- IOM bietet in den Konfliktgebieten technische und operative Unterstützung in Migrationsfragen an
- Analysiert die Ursachen der Migration
- Schlägt entwicklungsorientierte Lösungen vor
- IOM hat Informationsbedarf zu räumlichen Mustern der Transhumanz und Ursachen für die Vertreibung von Bevölkerungsgruppen
- Derzeit gibt es nur begrenzte Informationen zu Migrationsrouten, Weideflächen, Überdauerungssgebieten, Heimatgebieten oder Hirtepraktiken der Pastoralisten
- Verständnis der Treiberfaktoren von Transhumanzmustern, möglicher Konfliktquellen und der damit verbundenen Verdrängungsmuster ist eingeschränkt

Projektziele

- Aus Erdbeobachtungsdaten werden alle relevanten Umweltparameter abgeleitet.
- Zusatzdaten über räumliche Besonderheiten
- Daten des „Transhumance Tracking Tool“ sowie aus der „Displacement Tracking Matrix“ von IOM betrachtet.
- Analyse der raum-zeitlichen Transhumanz-Bewegungsmuster und Identifizierung potenzieller Konfliktbereiche
- Informationsprodukte sollen als Frühwarnsystem eine rechtzeitige Krisenvorsorge und -intervention auf lokaler Ebene ermöglichen.



Monitoring der Umweltparameter

EO product	Product updating frequency	Information benefits	
Surface water occurrence	Monthly water occurrence	Temporal, seasonal and permanent water bodies and water availability	
Drought hazard	Monthly anomalies	Indication of regional drought hazard	
Rangeland productivity	Monthly in the wet season	Grazing potentials and spatial anomalies; green biomass availability	
Bushfire Occurrence	Weekly in the dry season	Burned areas as "no go areas" for transhumance, fire regimes	
Irrigated and rainfed agriculture	Once at the beginning of the project	Shows potential conflict zones (increase of water use in irrigated areas could lead to decrease of water availability)	
Land cover/use and popul. density	Latest data available	Spatial pattern of land use and land use intensity, land use fragmentation	
Rainfall estimates	daily	Spatio-temporal rainfall patterns	
Identification of transhum. corridors	Daily (for a short demonstration period)	Monitoring of activities along transhumance corridors, livestock migration corridors, home ranges and important overlay areas/periods	

Population Map of Africa from CNN

1 million DigitalGlobe images tiles (64x64 pixels)
labelled by the use of OSM data

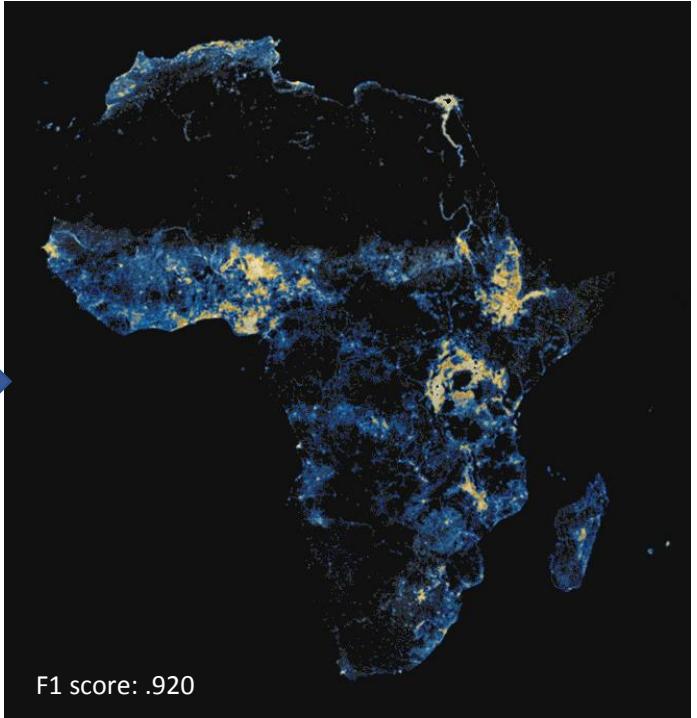


facebook

Artificial Intelligence

Training a ResNet50
(CNN, 50 layers deep)

Inference



<https://ai.facebook.com/blog/mapping-the-world-to-help-aid-workers-with-weakly-semi-supervised-learning>

Population Map of Africa from CNN



Source: Facebook

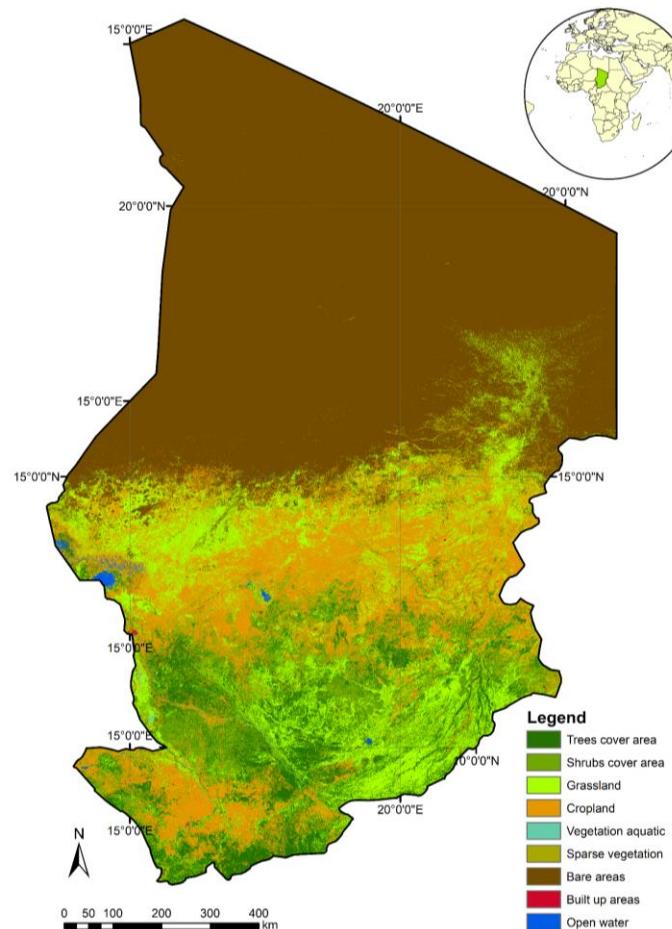


© Remote Sensing Solutions GmbH 2019

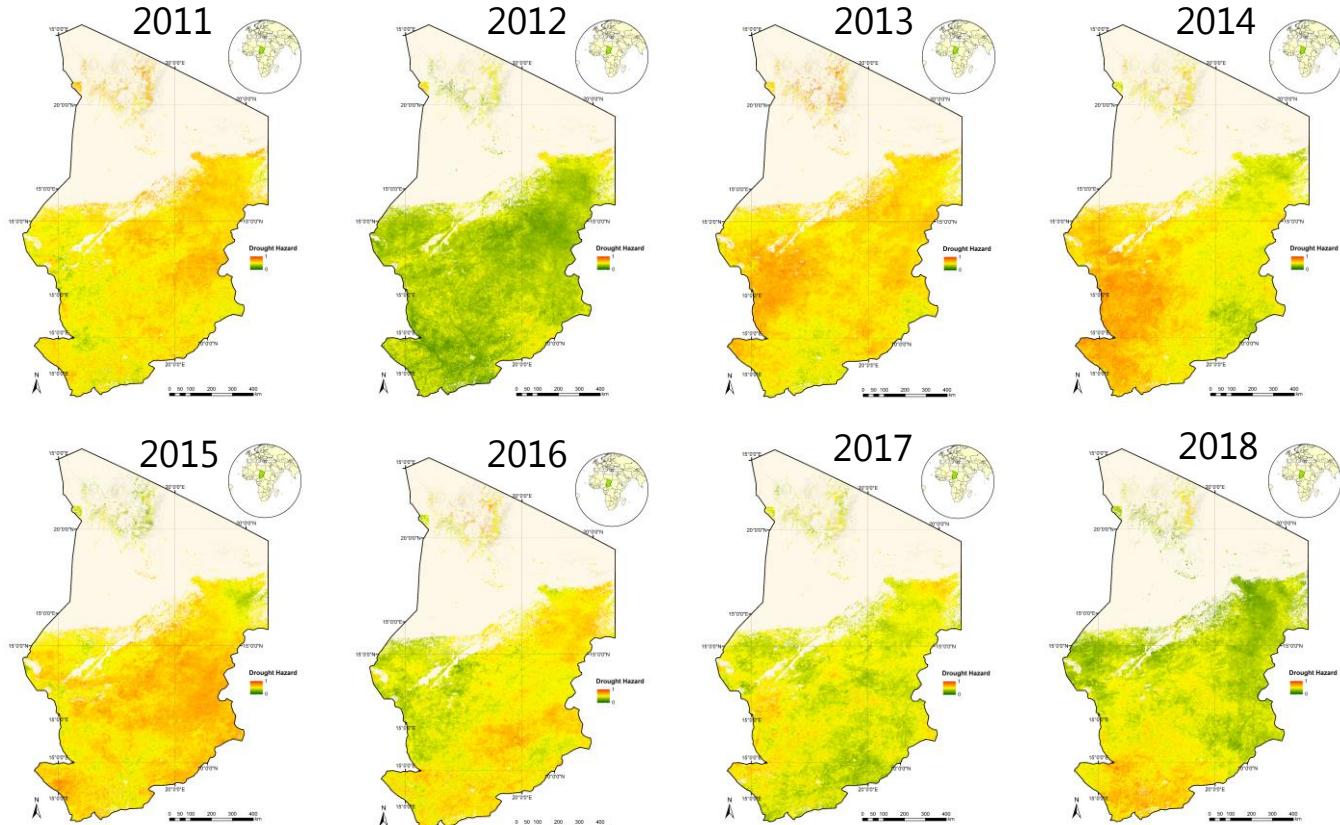
Funded by
 Federal Ministry for Economic Affairs and Energy
 DLR Space Administration

Land Cover

Existing data from the
ESA CCI Land Cover



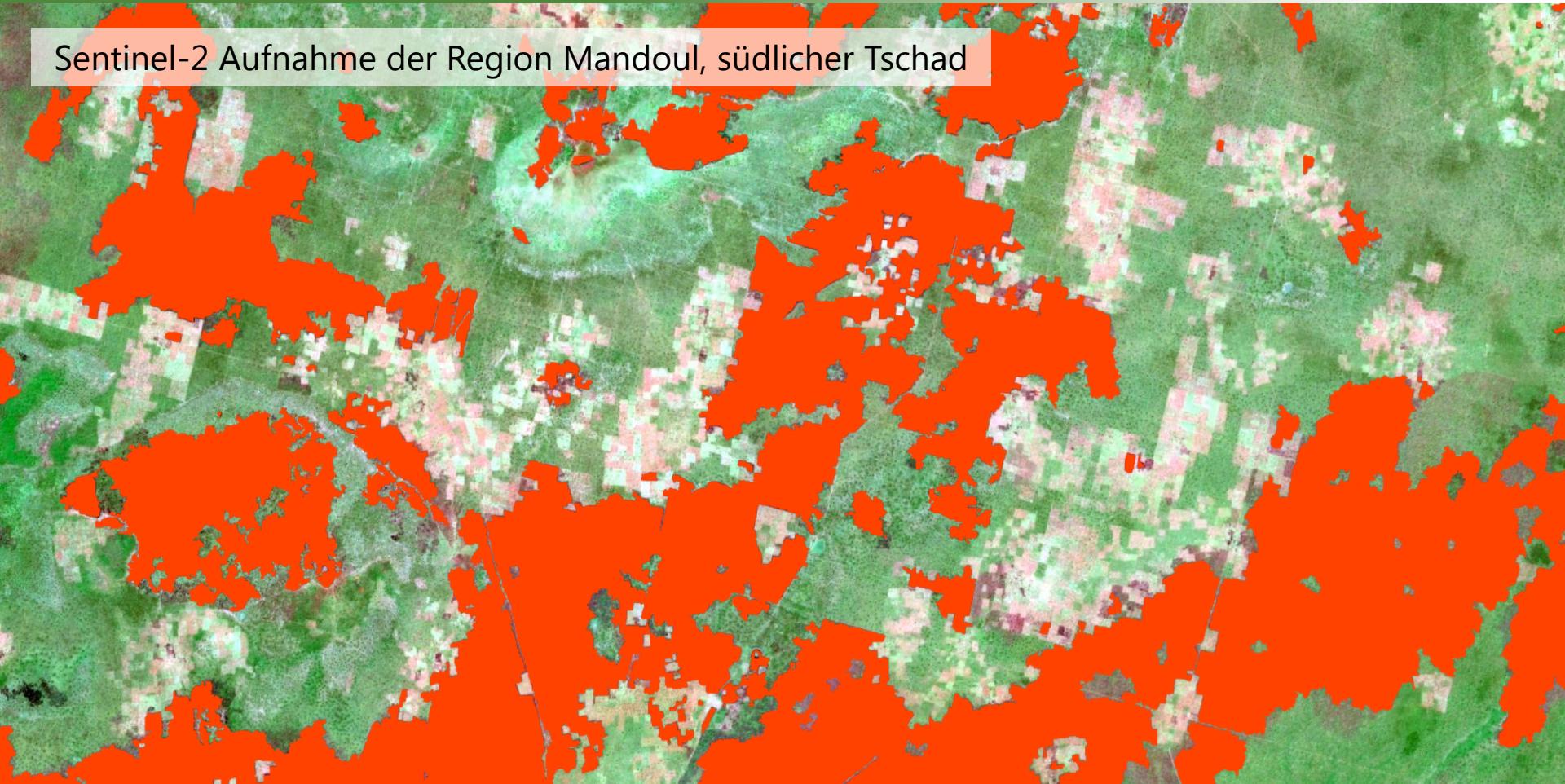
Dürregefahr



Schwarz M., Landmann T., Cornish N., Wetzel K-F., Siebert S., Franke J. (2019): A spatially transferable drought hazard and drought risk modeling approach based on remote sensing data. *Remote Sensing*, under review.

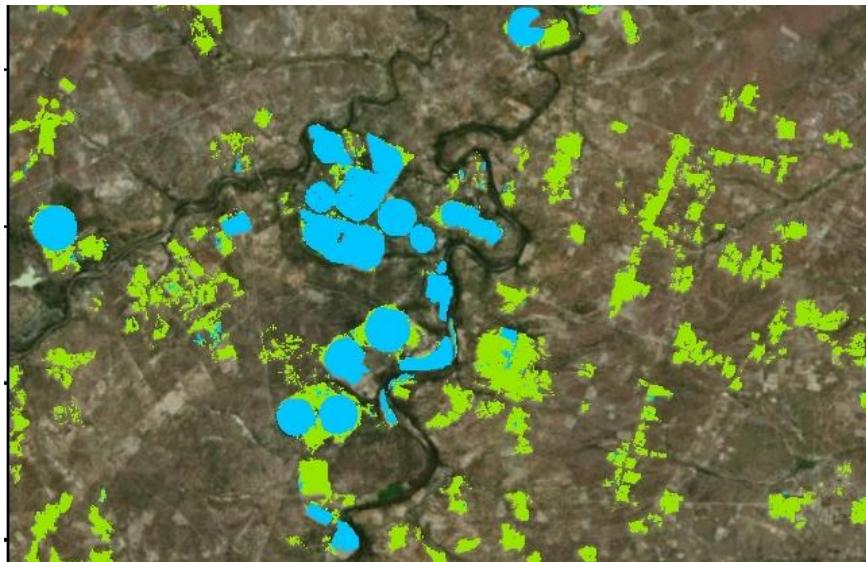
Brandflächen

Sentinel-2 Aufnahme der Region Mandoul, südlicher Tschad



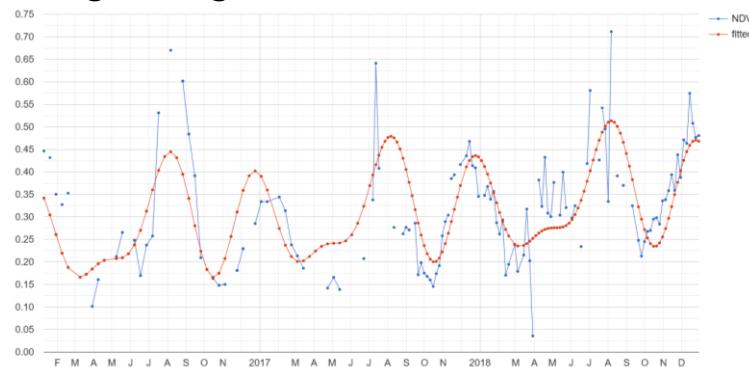
Bewässerungslandwirtschaft

Harmonische Analyse von Zeitreihen

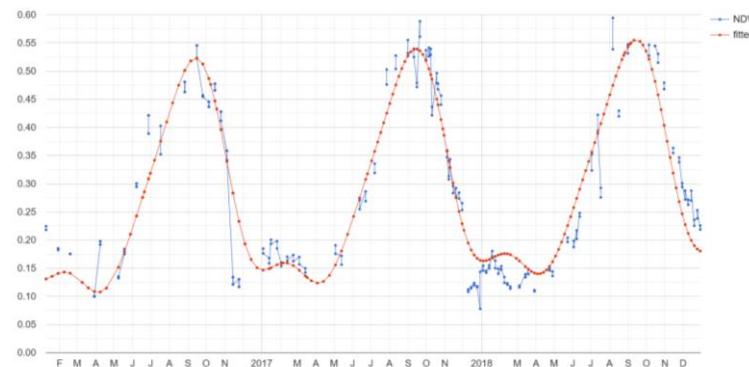


Landmann T., Eidmann D., Cornish N., Franke J. & Siebert S. (2019): Optimizing harmonics from Landsat time series data: the case of mapping rainfed and irrigated agriculture in Zimbabwe, *Remote Sensing Letters*, 10:11, 1038-1046

Irrigated agriculture

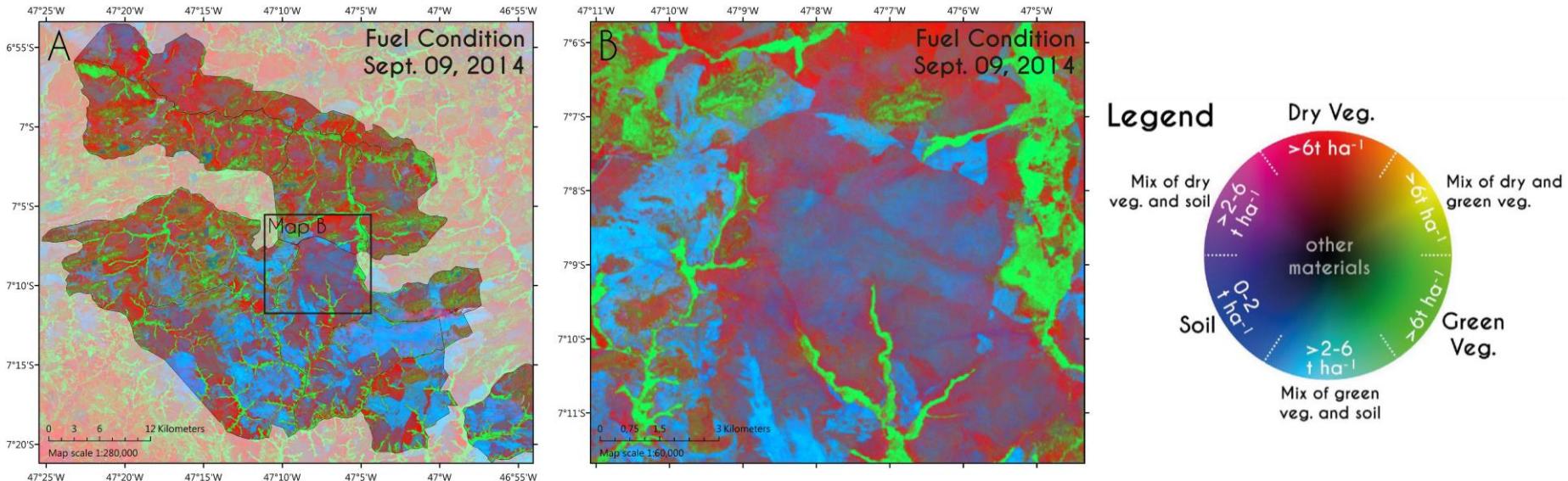


Rainfed agriculture



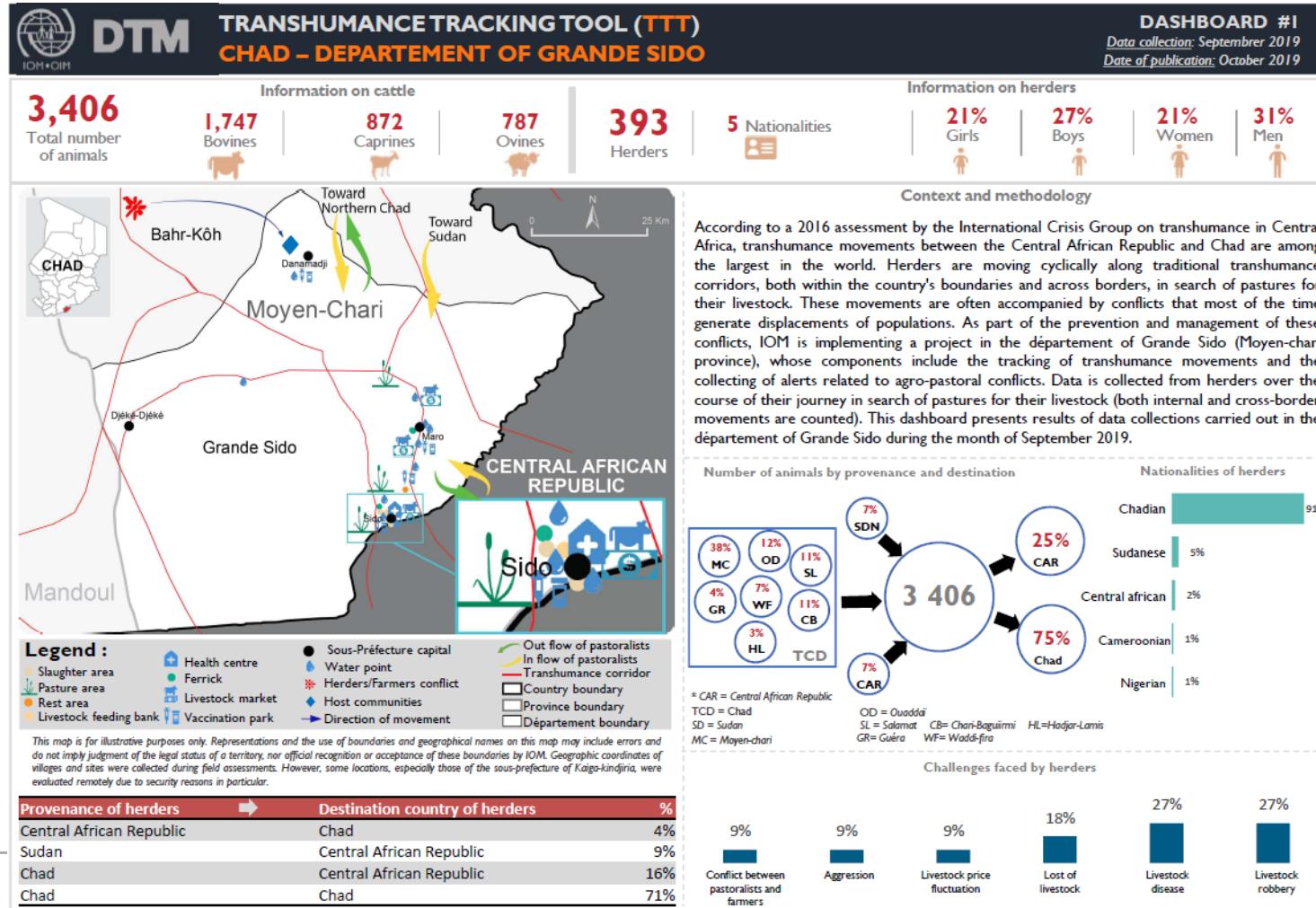
Produktivität von Grassland

Spektrale Entmischung (trockene Biomasse vs. grüne Biomasse und Vegetationsdichte)



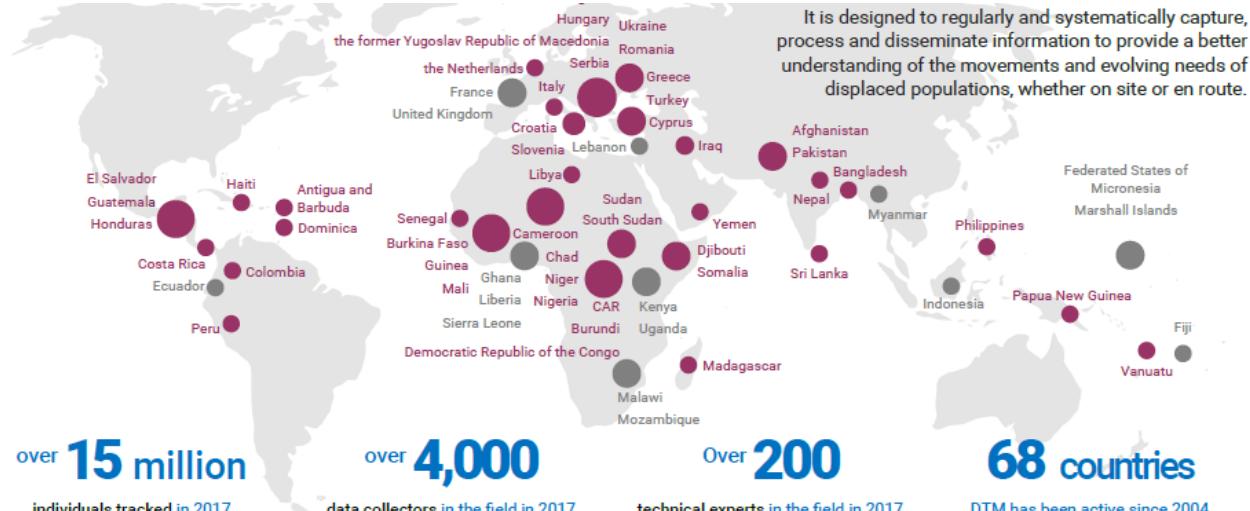
Franke, J., Barradas, A. C. S., Borges, M. A., Menezes Costa, M., Dias, P. A., Hoffmann, A. A., Orozco Filho, J. C., Melchiori, A. E., Siegert, F. (2018) Fuel load mapping in the Brazilian Cerrado in support of integrated fire management. *Remote Sensing of Environment*, 217, 221-232.

IOM's Transhumance Tracking Tool (TTT)



Provenance of herders	→	Destination country of herders	%
Central African Republic		Chad	4%
Sudan		Central African Republic	9%
Chad		Central African Republic	16%
Chad		Chad	71%

IOM's Displacement Tracking Matrix (DTM)



DATA IS COLLECTED ON:

-  Population
-  Locations
-  Conditions
-  Needs and Vulnerabilities
-  Flows

HOW DATA IS COLLECTED:

MOBILITY TRACKING

systematically tracks mobility and cross-sectoral needs in locations of interest to target assistance

GROUP & LOCATION

tracks movement flows and the overall situation at key points or origin, transit locations, and points of destination

FLOW MONITORING

REGISTRATION

registers individuals and households for beneficiary selection, vulnerability targeting and programming

HH AND INDIVIDUAL

gathers specific information using sampling from the population of interest

PRODUCTS INCLUDE:



GIS products
Static Maps, Shapefiles and Geodatabase, KML/KMZ, and Thematic Atlas



REPORT documents
DTM Report, Site/Area Profiles, Statistical Dashboard, Flow Monitoring Analysis, Event Trackers



ONLINE interactive
Website, Data and Visualization Portal, and Online Data Analytic Platform



DATA sharing
Raw Data, Customized Data Exports, Lists, and Tables

Vielen Dank!



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