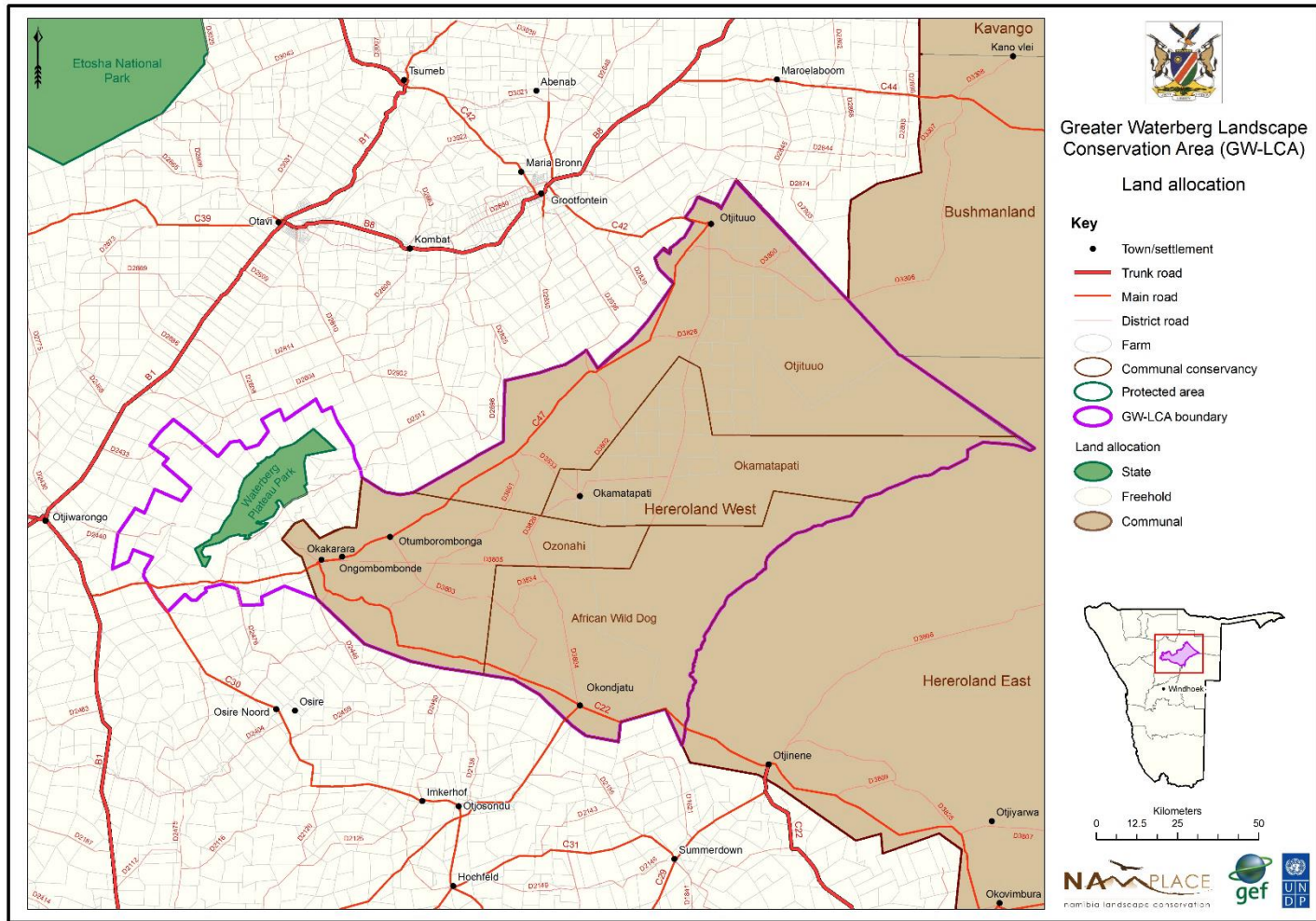


BUSH ENCROACHMENT AND BUSH THINNING IN NAMIBIA

- 45 million hectares of Namibian farmland are considered “bush encroached”.
- Otjozondjupa is the region most severely affected by bush encroachment.
- NamTip ecological studies on a commercial farm: bush thinning results in less bush for up to 40 years and a much more productive grass layer for up to 20 years.
- Bush biomass value chains and especially bush-to-energy value chains emerged.
- Bush-based energy production links agricultural with energy sector.

STUDY AREA AND METHODS



Waterberg region in Namibia



Interviews

Commercial farmers, companies, associations, state entities and international cooperation organisations



Policy Analysis

EU regulation and Namibian Laws, ordinances and government programmes

RESEARCH QUESTIONS

- What is the current state of the transformation toward bush-to-energy value chains in Namibia?
- What technical, economic, political, social and ecological factors facilitate or hinder the emergence of bush biomass value chains in Namibia?

BUSH BIOMASS VALUE CHAINS – CURRENT STATE

Indicator	Charcoal value chain	Wood chips value chain
Maturity of value chain	Well-established	Emerging
Local offer	High	Low
Local/international demand	High international demand	Low local demand, no export
Entry costs	Low	High
Degree of technology	Low	High
Institutional support	High	Low
Regulatory environment	Enabling	Enabling, but no certification schemes

BUSH BIOMASS VALUE CHAINS – CHALLENGES

Charcoal value chain



Labor management issues

- Challenges in managing, supervising, and trusting charcoal workers
- Concern of incorrect harvesting (e.g. cutting of large, protected trees)



Regulatory and bureaucratic hurdles

- Lack of digital processes to apply for permits
- Limited capacity of forestry offices
- Certification requirements (e.g. FSC, EUDR) challenging for some



Ecological concerns

- Environmental risks from overharvesting or incorrect thinning: Aggressive bush regrowth after thinning (especially with mechanical or incorrect manual clearing)
- Need for proper aftercare and ecological monitoring
- Environmental risks from charcoal burning (air pollution, fire hazards)

Wood chips value chain



Socio-technical barriers

- Lack of suitable and affordable machinery adapted to Namibian conditions



Lack of experience and scientific knowledge

- Insufficient technical expertise, data, and experience regarding the production and utilization of wood chips
- Development currently driven by “trial and error” among pioneering actors



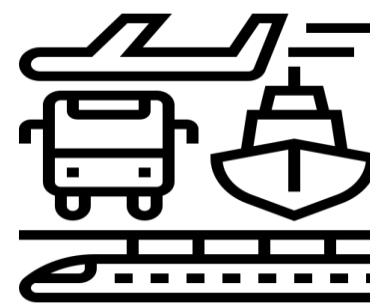
Ecological concerns

- Negative impact of full bush removal on ecosystem functionality (mineral cycle, grass protection, and soil stability)



Cost-related barriers

- Very high investment costs (harvester, chipper, grinder, boiler)
- High operational and maintenance costs (especially due to machine wear)
- Financial investment is too high for most farmers or small businesses



Infrastructure and markets

- Long transport distances & high costs due to inefficient rail system
- Limited local demand for wood chips, only few established buyers
- Underdeveloped export channels and missing infrastructure for scale-up

CONCLUSION

- Well-established charcoal value chain and emerging wood chips value chain
- Charcoal value chain generate farm income, but is not relevant to replace fossil fuels
- Wood chips value chain has potential to generate farm income and to replace fossil fuels

Acknowledgements

This work was funded by the German Federal Ministry of Research, Technology and Space (BMFTR, former BMBF) within the GlobalTip Research Call under the project “Cooperative Project in GlobalTip: A Namibian Perspective on Desertification Tipping Points in the Face of Climate Change” (NamTip, grant numbers: pre-phase 01LC1714B, first main phase 01LC1821E and second main phase 01LC2321E). We thank Anja Linstädter and Stefan Liehr for their role in setting up the NamTip project. We thank the interviewees and especially the farmers of the Waterberg region that supported our research.

Project Information

The collaborative German-Namibian research project “NamTip – A Namibian Perspective on Desertification Tipping Points in the Face of Climate Change” aims to better understand the development of ecological tipping points in dryland rangelands by assessing desertification and woody plant encroachment processes. It also explores management options for preventing such tipping points and restoring degraded rangeland ecosystems.

Pre-phase: 06/2017 – 05/2018
First main phase: 04/2019 – 07/2023
Second main phase: 09/2023 – 05/2026

For further reading

Grieger L, Brinkmann K, Rauchecker M, Liehr S (2025): Desertification as a Social–Ecological Trap: How Does It Come About and What Are Namibian Freehold Farmers Doing About It? Land 14 (5), 1016.



Brinkmann K, Menestrey Schwiager DA, Grieger L, Heshmati S, Rauchecker M (2023): How and why do rangeland changes and their underlying drivers differ across Namibia's two major land-tenure systems? The Rangeland Journal 45 (3), 123-139.

