

ZAMBIA

Zambia is undergoing high and increasing rates of forest loss, but still has large forest resources. Attempts at control have largely failed outside protected areas, and forest reserves have also been lost.)

Drivers of deforestation

Smallholder farming		The main driver, linked to rural population growth ^[1] and the demand for land for subsistence agriculture ^[2] , expansion of cash crops like tobacco and cotton, and poor farming that exhausts soils and encourages additional land clearance ^[3] .
Charcoal		The key driver in some areas ^[4] ; extraction increases fire risk ^[5] . Urban charcoal use persists even if electricity is available due to frequent outages and load shedding ^[6, 7] . Supplies close to 87% of domestic energy needs and 30% of rural industry requirements, e.g. brickmaking.
Timber extraction		Significant, for domestic use and export, and opens up the forest to disturbance including fire ^[8] . Illegal felling is rampant, e.g. illegal rosewood costs Zambia US\$3.2 million a year ^[9] . Zambia exports mainly to the Southern African Development Community (SADC) region but also to China and Taiwan. Although log exports are officially banned, these occur, particularly to DRC ^[10] .
Fire		FAO estimates 5% of forest burns each year ^[8] ; often through accidental spread during burning of crop residues and cropland preparation ^[3] .
Livestock grazing		Significant in some places and overgrazing is reported ^[10] ; burning to increase grazing also results in fires in forests.
Mining operations		Causes some deforestation but is a minor factor overall ^[11] .
Road expansion		Stimulates deforestation by opening to agricultural expansion and charcoal production ^[12] .

- Primary cause of forest loss and/or severe degradation
- Secondary cause of forest loss and/or severe degradation
- Less important cause of forest loss and/or severe degradation

Underlying causes

Amongst underlying causes, population pressure has direct impacts on forest cover through pressure for land^[13]. Greater security of forest tenure is associated with better forest condition, while greater dependence on forests for livelihoods tends to create poorer forest condition^[14].

Countries, region	Zambia, Southern Africa
Forest type	Tropical dry forest (miombo)
Total area	15.9Mha
Forest area in 2018	10.3Mha (64.5% of total deforestation front area)
Forest loss 2004-2017	0.4Mha (3.7% of forest area in 2000)
Location of deforestation	Principally in the southeast of the country
Total forest core area in 2018	4.1Mha (40.1% of forests in 2018)
Fragmented forests 2000-2018	1.1Mha (10.4% of forest area in 2000)
Accumulated burned area, 2002-2019	7.5Mha (70.1% of forest area in 2000)
Deforestation trend	Increasing, more than doubled from 2010-2018 compared to the previous decade
Future trends	Likely to increase

Responses

Protected areas	641 protected areas covering 41.26% of the country; but 555 of these are forest reserves with varying degrees of effectiveness ^[15] . Nonetheless, protected areas, including national forests, are identified as important for forest recovery ^[16] .
PES incl. REDD+	Research shows Zambian forests are still a major carbon sink despite losses, and growth rates may be being stimulated by higher CO ₂ levels ^[5] . Carbon markets are important with a World Bank BioCarbon Fund project aiming to take a landscape approach to reducing forest loss ^[18] .
Charcoal alternatives	Government efforts focus on providing alternatives to charcoal, with increasing productivity and income seen as a key factor ^[17] .
Voluntary standards	A process has been ongoing since the 1990s, but still no certified forest ^[19] . Tenure issues are problematic because all forests are state-owned ^[20] .

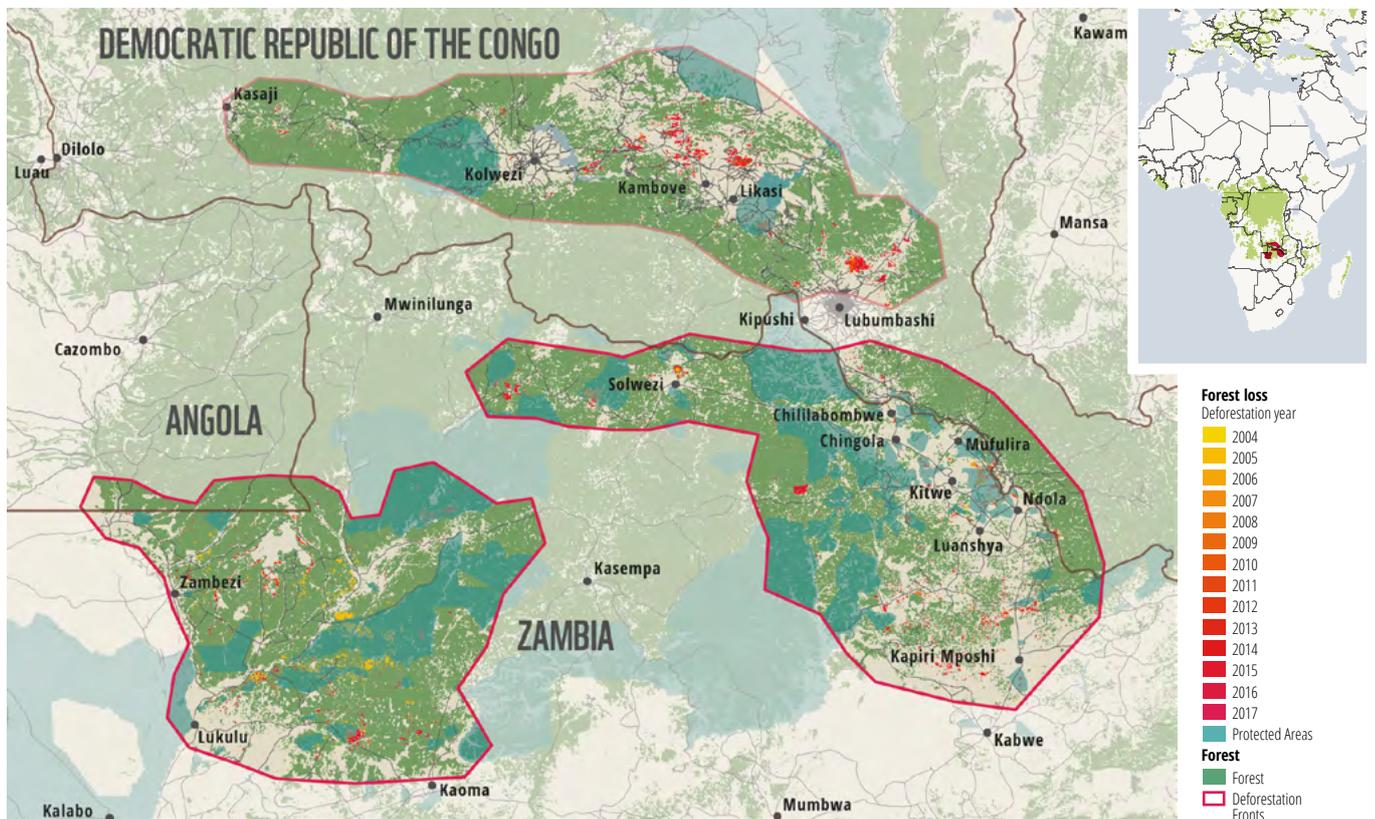
- Deployment at wider scale
- Actively used and expanding
- Project-specific, experimental

Main outcomes

Despite efforts by the government, donors and NGOs, deforestation is continuing in Zambia, driven primarily by rising numbers of people using inefficient agriculture. Major structural interventions will be needed to reverse these trends. The San people remain seriously disadvantaged in the country.

Recommended future actions

- Increase effectiveness of the existing protected area network, particularly the large number of forest reserves, possibly through a planned rationalization of the system.
- Develop carbon markets.
- Address the worrying lack of certified forests.



References

- Nkolola, N., Nyasa, L., and Ngonga, C. 2016. Drivers of deforestation in the miombo woodlands and their impacts on the environment. *Advances in Research* 6: 1-7.
- Ngoma, H., Pelletier, J., Mulenga, B.P., and Subakanya, M. 2019. *Climate-smart agriculture, cropland expansion and deforestation in Zambia: linkages, processes and drivers*. Indaba Agricultural Policy Research Institute, Lusaka, Zambia.
- Wathum, G., Seebauer, M., and Carodenuto, S. 2016. *Drivers of Deforestation and Forest Degradation in Eastern Province, Zambia: Zambia Integrated Forested Landscape Program*. The World Bank, Washington DC, USA.
- Pelletier, J. 2017. Agriculture expansion, wood energy and woody encroachment in the Miombo woodlands: striving towards sustainability in Zambia. Fall Meeting of the American Geophysical Society.
- Pelletier, J., Barrett, C.B., Trainor, A.M., and Siampale, A. 2018. *Intensification of forest disturbances caused by charcoal production in dry tropical forests (miombo woodland) in Zambia*. Fall Meeting of the American Geophysical Society.
- Mulenga, B.P., Tembo, S.T., and Richardson, R.B. 2019. Electricity access and charcoal consumption among urban households in Zambia. *Development Southern Africa* 36(5): 585-599.
- Samboko, P., Dlamini, C., Moombe, K., and Syampungani, S. 2016. *Load shedding and charcoal use in Zambia: What are the implications on forest resources*. Indaba Agricultural Policy Research Institute (IAPRI), Lusaka, Zambia.
- Chomba, B.M., Tembo, O., Mutandi, K., Mtongo, C.S., and Makano, A. 2012. *Drivers of deforestation, identification of threatened forests and forest cobenefits other than carbon from REDD+ implementation in Zambia*. A consultancy report prepared for the Forestry Department and the Food and Agriculture Organization of the United Nations under the national UN-REDD Programme. Ministry of Lands, Natural Resources and Environmental Protection, Lusaka, Zambia.
- PROFOR. 2018. Food and forests: We can have them both. www.profor.info/content/food-and-forests-we-can-have-them-both
- Lukumbuza, K. and Sianga, C. 2017. *Overview of the Timber Trade in East and Southern Africa: National Perspectives and Regional Trade Linkages*. TRAFFIC and WWF, Cambridge, UK. 53pp. www.traffic.org/site/assets/files/2154/timber-trade-east-southern-africa.pdf
- Vinya, R., Syampungani, S., Kasumu, E.C., Monde, C., and Kasubika, R. 2011. *Preliminary study on the drivers of deforestation and potential for REDD+ in Zambia*. FAO/Zambian Ministry of Lands and Natural Resources, Lusaka, Zambia.
- Pelletier, J., Paquette, A., Mbindo, K., Zimba, N., Siampale, A., Chendauka, B., ... Roberts, J.W. 2018. Carbon sink despite large deforestation in African tropical dry forests (miombo woodlands). *Environmental Research Letters* 13: 094017.
- Ferrer Velasco, R., Köthke, M., Lippe, M., and Günter, S. 2020. Scale and context dependency of deforestation drivers: Insights from spatial econometrics in the tropics. *PLOS ONE* 15(1): e0226830.
- Stickler, M.M., Huntingdon, H., Haflett, A., Petrova, S., and Bouvier, I. 2017. Does de facto forest tenure affect forest condition? Community perceptions from Zambia. *Forest Policy and Economics* 85(1): 32-45.
- Protected Planet. 2020. Zambia. Available from: www.protectedplanet.net/country/ZM [last accessed 23 February 2020].
- Phiri, D., Morgenroth, J., and Xu, C. 2019. Long-term land cover change in Zambia: An assessment of driving factors. *Science of the Total Environment* 697: 134206.
- Mulenga, B.P., Hadunka, P., and Richardson, R.B. 2017. Rural households' participation in charcoal production in Zambia: Does agricultural productivity play a role? *Journal of Forest Economics* 26: 56-62.
- World Bank. 2018. Zambia takes the keys away from 'drivers' of deforestation. Available from: www.worldbank.org/en/news/feature/2018/03/02/zambia-takes-the-keys-away-from-drivers-of-deforestation
- Kalonga, S.K., Teketay, D., Mutta, D., Hassan, A., Road, M., and Estate, R. 2019. Status of forest certification in eastern and southern Africa sub-regions. *Journal of Rural Development* 4(1): 109-123.
- Njovu, F.C. 2004. Forest certification in Zambia. In: *Forest Certification in Developing and Transitioning societies: Social, economic and ecological effects*. Yale School of Forestry and Environmental Studies, New Haven, USA.