

## **Supplementary S1: Description of the three studied provinces**

### **Niassa province**

Located in northern Mozambique, Niassa has a legacy of isolation: it is geographically far from the most important economic areas of Mozambique, with significant distances and low quantity and quality of terrestrial connections. It is an underdeveloped province compared to other Mozambican provinces, but with great potential for sustainable resource management (INGC 2009). Agriculture, eco-tourism and mining are seen as the most important opportunities for development in the province (Governo da Província do Niassa 2017). These potential is geographically distributed within the province: Lago Niassa district has the most prominent mining potentials, the districts around the Nacala corridor has the highest agrarian and mining potentials, the Niassa National Reserve has the highest tourist potential. In contrast, Lúrio valley has the potential for investments in agriculture, forestry, wildlife and tourism. Transport costs are so high that smallholder farmers are not incentivised to diversify their crop production neither to actively participate in the formal forestry sector (Cuvilas *et al.*, 2010). This has led rural communities to be centred on subsistence farming with little use of fertilizers or pesticides (Palmer and Silber, 2012) and informal forest use. Miombo woodlands are the predominant vegetation in the region, and they offer several ecosystem services to rural households, including hunting, wood and charcoal, and medicinal plants (Landry and Chirwa, 2011), which are especially essential as a coping mechanism in situations of scarcity. Land conflicts with forestry companies have arisen as a consequence of its great potential (ORGUT 2014).

### **Zambezia province**

Zambezia has a long history of agricultural production, and since colonial times both small scale (familiar) agriculture and big agricultural plantations have been present. In the XIX century, the province was governed by the Portuguese government based on a feudal system that changed to a private company system at the end of the century (<http://www.zambezia.gov.mz/por/A-Propvincia/Agricultura>; Newitt, 1995). Zambezia Province has a high population density compared to other Mozambican provinces (48,7 hab./km<sup>2</sup> (GdM, 2018)), and nowadays land has become a limiting factor for development. Land conflicts have arisen between local farmers and big companies, especially in the Gurue District (Baumert *et al.*, 2018). This occurs specially around lands initially used by large colonial farms, that after the independence from Portugal in 1975 were converted into state-run enterprises (Zaehring *et al.*, 2018), and later abandoned during the Civil War (1977-1992) (Unruh, 1998). The rural population that had been cultivating these lands moved to the urban peripheries because people were more secure than in remote lands (Temudo and Silva, 2011). After the war, the population returned to the rural areas, some of them cultivating ancient colonial farmlands for subsistence. More recently, the government has encouraged foreign investment for large scale agricultural operations, triggering land conflicts between these companies, that have obtained legal land rights, and local farmers, that have been cultivating the lands during the last few years (Bleyer *et al.*, 2016; Karhuus, 2018; Vermeulen & Cotula, 2010; Zaehring *et al.*, 2018).

### **Gaza Province**

Gaza Province has an arid climate, with poor or medium quality soils. It offers an economic potential for a) tourism in the coast and in some nature protected areas, b) agriculture especially in the lower parts near the coast, with better soils and more water availability for irrigation than in the West, and c) for cattle raising, as one of the provinces with the highest number of livestock, in part because other parts of the country are affected by the Tse Tse fly, like the provinces of Niassa and Zambezia. Cattle is an effective way to use natural resources of the province, especially in areas with poor soils and low water availability. Some numbers from statistics.

In the west part of the province, Mabalane and Massingir districts are the main sources of the charcoal consumed in Maputo (Luz *et al.*, 2015). The production of charcoal is however degrading the Mopane woodlands significantly (Sedano *et al.* 2020), and forest fires are also an important threat to woodlands.

### **PROSAVANA project**

The Government of Mozambique is developing one initiative that has particular importance for the rural development of Niassa and Zambezia provinces. The government, together with the Japanese and the Brazilian International Cooperation Agencies are promoting the PROSAVANA project since 2011 in an area extending over 107,002 km<sup>2</sup> of land. It has faced considerable opposition from civil society, which changed the scope of the project. The project now looks at “providing opportunities to change from subsistence agriculture into sustainable agriculture (with respect given to the farmers’ sovereignty) and at promoting responsible investments and activities, aiming to establish a win-win relationship between small-scale farmers and agribusiness firms” (<https://www.prosavana.gov.mz/what-is-prosavana/>).

### References:

- Baumert, S., Fisher, J., Ryan, C., Woollen, E., Vollmer, F., Artur, L., ... & Mahamane, M. 2019. Forgone opportunities of large-scale agricultural investment: A comparison of three models of soya production in Central Mozambique. *World Development Perspectives*, 16, 100145.
- Bleyer, M., Kniivilä, M., Horne, P., Siteo, A., & Falcão, M. P. 2016. Socio-economic impacts of private land use investment on rural communities: Industrial forest plantations in Niassa, Mozambique. *Land Use Policy*, 51, 281-289.
- Governo do Moçambique (GdM). 2018. *Resultados Preliminares de Recolha Estatística, referentes ao IV Recenseamento Geral da População e Habitação, CENSO 2017*. Instituto
- Luz, A. C., Sophia, B., Fisher, J., Grundy, I., Matediane, M., Genevieve, P., & Zorrilla, P. 2015. Charcoal production and trade in southern Mozambique: historical trends and present scenarios. In *XIV World Forestry Congress, Durban, South Africa, 7–11 September*.
- Newitt, M. D. D. 1995. *A history of Mozambique*. Indiana University Press.
- Sedano, F., Lisboa, S. N., Duncanson L., Ribeiro, N., Siteo, A., Sahajpal R., Hurtt G., Tucker C. J. 2020. Monitoring forest degradation from charcoal production with historical Landsat

imagery. A case study in southern Mozambique. *Environmental Research Letters* 15 015001. doi.org/10.1088/1748-9326/ab3186

- Temudo, M.P., Silva, J.M.N. 2011. Agriculture and forest cover changes in post-war Mozambique. *J. Land Use Sci.* 4248, 1–18. oi:10.1080/1747423X.2011.595834
- Unruh, J.D. 1998. Land tenure and identity change in postwar Mozambique. *GeoJournal*. doi:10.1023/A:1006990130091
- Vermeulen, S., & Cotula, L. 2010. Over the heads of local people: consultation, consent, and recompense in large-scale land deals for biofuels projects in Africa. *The Journal of Peasant Studies*, 37(4), 899-916.
- Zaehringer, J.G., Atumane, A., Berger, S., Eckert, S. 2018. Large-scale agricultural investments trigger direct and indirect land use change: New evidence from the Nacala corridor, Mozambique. *J. Land Use Sci.* doi:10.1080/1747423X.2018.1519605