

# Botswana

Total population (July 2000 estimate): 1,576,000

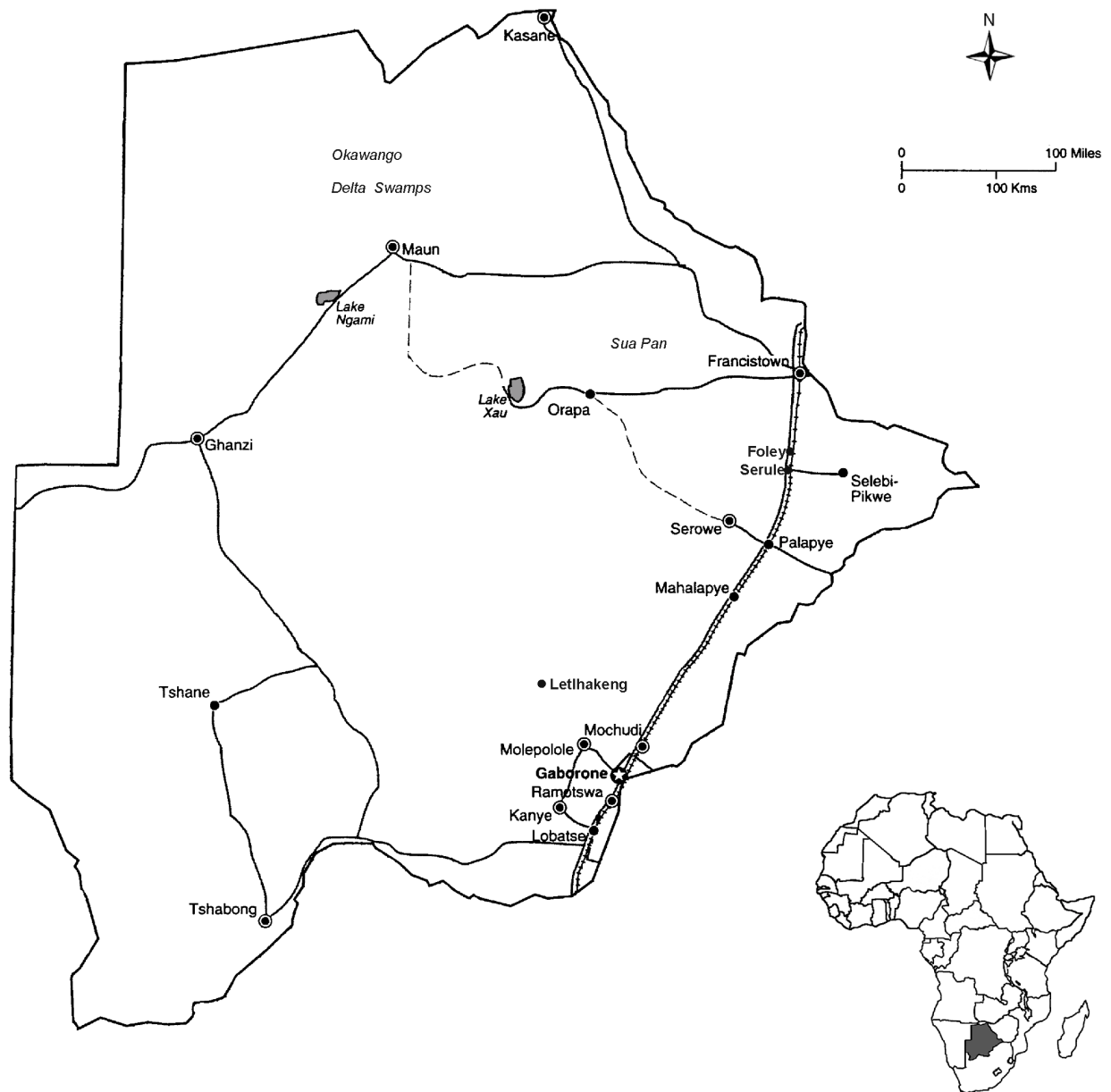
Area: 600,370 km<sup>2</sup>

Annual population growth rate (2000): 0.76%

Life expectancy at birth (1998): 46.2 years

People not expected to survive to age 40 (1998): 37.1% of total population

GDP per capita (1998): US \$6,103



Botswana is a landlocked country in the centre of southern Africa. The eastern third of the country is comprised of undulating plains with isolated hills made up of Precambrian rocks. This part of Botswana is called the hardveld. The remaining two-thirds of the country is covered by Kalahari Sands, with deep sandy soils of very low agricultural productivity.

Near-desert conditions prevail in large parts of the country. Average annual rainfall in the southwest of the country is less than 250 mm and even this falls erratically. Droughts are common and can last for several years. About 22% of the population is engaged in agriculture, specifically pastoralism and agricultural crop production. Arable agriculture depends on extensive rain-fed cultivation of sorghum, millet, pulses, and watermelon. The most limiting factor for crop production is precipitation.

Animal products and meat are major export products.

Mining of diamonds remains the most important economic activity in Botswana. It contributes around one-third of Botswana's Gross Domestic Product (GDP) and provides 75% of the export earnings. Other major mining activities include copper-nickel mining at Selebi-Pikwe and soda ash and salt mining at the Sua Pan brine deposit.

The main energy source in Botswana is coal, which is used to produce electrical power.

Other mining activities include small-scale mining of gold and semi-precious stones, as well as extraction of construction materials. No industrial minerals have been used for agricultural purposes.

At US \$6,103 Botswana's GDP per capita in 1998 was one of the highest in sub-Saharan Africa.

### **Geological outline**

The geology of Botswana is largely obscured by Cretaceous to Recent Kalahari Beds, consisting mainly of aeolian sands. Archean and Paleoproterozoic rocks occupy parts of eastern Botswana. A sequence of Mesoproterozoic and Neoproterozoic, northeast-striking rocks, that are continuations of Proterozoic rocks from Namibia, cross into western Botswana (Kampunzu *et al.* 2000).

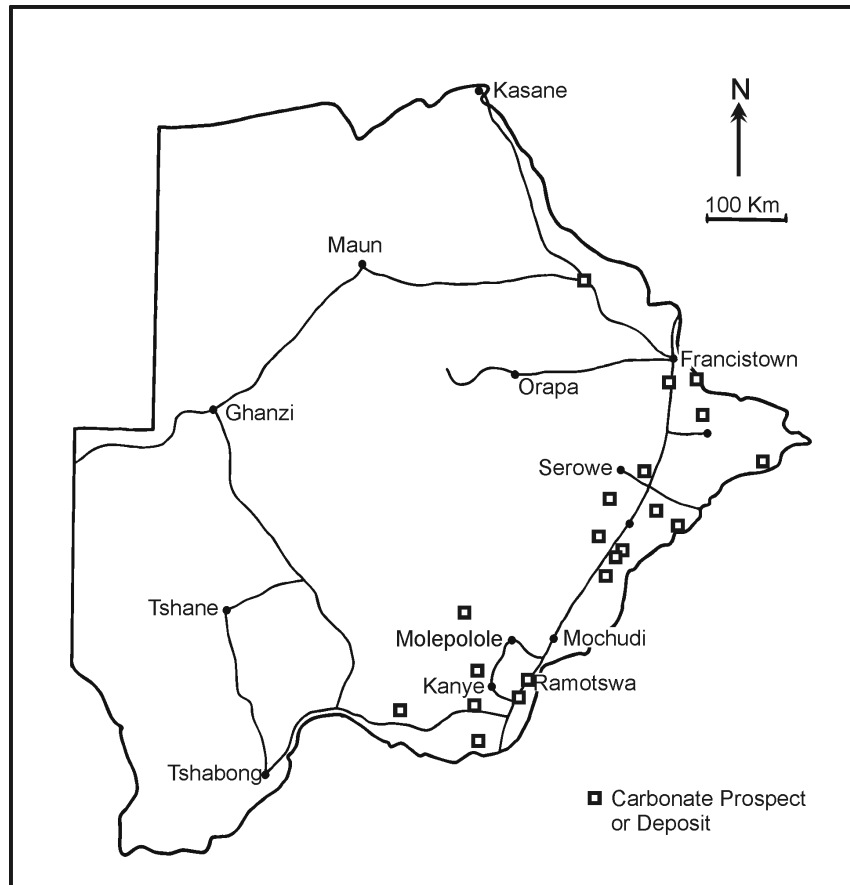
Karoo sediments, mainly of continental-fluvial origin, and thick basaltic lavas overlie Precambrian rocks in the east of the country.

### **AGROMINERALS**

No phosphate occurrences are reported from Botswana. However, there are extensive limestone, dolomite and calcrete deposits in the country. Small-scale lime kilns have been in operation at several sites, mainly for the production of quicklime for use as mortar, plaster and for soil stabilization. There has been no reported use of limestones or dolomites for crop production in farming areas.

Limestones, marbles and dolomites have been identified at several sites (Figure 2.4). In Precambrian rocks considerable reserves of dolomitic marble and dolomitic limestones have been located in eastern Botswana in an area between Francistown and Mahalapye (Gwosdz 1996).

Superficially developed calcrete deposits with varying chemical composition are known around Letlhakeng, in the Kanye area, as well as near Ghanzi and Maun. Many of these limestones are not suitable for the production of cement because of their high magnesium content but they are suitable for quicklime burning. The Geological Survey Department of Botswana published an inventory of carbonate deposits and their potential for quicklime production in Botswana (Gwosdz and Modisi 1983, 1984).



**Figure 2.4:** Limestone occurrences in Botswana (after Ministry of Minerals and Water Affairs, 1985).

## Gypsum

Gypsum resources are located west of Foley and near Bojanamane, southwest of Serule. Whether they are extracted and used for improving soil structure, among other things, is not known.

## Agromineral potential

The use of agrominerals in Botswana is very limited due to the small area of crop production and the unsuitable harsh climatic and physical conditions.

### References:

- Gwosdz W 1996. Botswana. In: Bosse H-R, Gwosdz W, Lorenz W, Markwich, Roth W and F Wolff (eds.) Limestone and dolomite resources of Africa. Geol. Jb., D, 102:78-90.
- Gwosdz W and MP Modisi 1983. The carbonate resources of Botswana. Geol. Surv. Botswana Min. Res. Rep. 6,167pp.
- Gwosdz W and MP Modisi 1984. The potential for quicklime production in Botswana. Geol. Surv. Botswana Min. Res. Rep. 7,50pp.

Kampunzu AB, Armstrong RA, Modisi MP and RBM Mapeo 2000. Ion microprobe U-Pb ages on detrital zircon grains from the Ghanzi Group: implications for the identification of a Kibaran-age crust in northwest Botswana. *J. Afr. Earth Sci.* 30:579-587.

Ministry of Mineral Resources and Water Affairs 1985. Small scale mining in Botswana, 30pp.