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Lessons on sustainability from the ancient society of Great Zimbabwe

The World Heritage Site of Great Zimbabwe – one of the most iconic and largest archaeological settlements in Africa – offers more than just an interesting insight into how pre-colonial African states and societies functioned. It also provides food for thought on sustainable development in Africa.

At its peak, the population of Great Zimbabwe was far sparser than previously believed – with a total population of no more than 10 000 concentrated in 2.9 square kilometres (half the size of earlier estimates). This low population explains how the inhabitants of Great Zimbabwe lived sustainably in the region without negative consequences for the environment.

These are the recent findings of a team of researchers, led by Associate Professor Shadreck Chirikure of the Department of Archaeology at the University of Cape Town, and detailed in [a paper published today in the prestigious PLOS ONE journal](#).

“This low population tells us that the economy of Great Zimbabwe was organised around households, with trade and exchange providing the surplus,” says Chirikure.

“Furthermore, it tells us that you do not need big populations to trade and exchange. Great Zimbabwe, despite its low population, had exchange relationships with areas in different parts of the world.”

This finding also debunks the theory that overpopulation led to the eventual decline and collapse of Great Zimbabwe.

“It is unlikely that the abandonment of Great Zimbabwe was an outcome of the negative ecological consequences stemming from high populations,” says Chirikure.

“Archaeological evidence suggests that Great Zimbabwe was never abandoned, but its longevity and resilience was likely based on maintaining a good ecological balance

between low population and available resources: water, land and pastures. Mineral wealth would have been obtained through redistribution mechanisms such as tribute collection, and normal trade and exchange relationships.”

Prior to this discovery, archaeologists believed that, at its peak, Great Zimbabwe had a fully urban population of 20 000 people concentrated in around 2.9 square km (40% of 720 hectares). This translates to a population density of 6 897 per square kilometer, which would be comparable with that of some of the most populous regions of the world in the 21st century.

For comparison, in 2016, the population density of Hong Kong was 6 996 per sqm, while the 2013 population density for New York City was 10 292 people per sqm. Khayelitsha, a populous low-income township in Cape Town, had a 2016 population density of 7 748 people per sqm.

The study used techniques from ethnography – based on average household sizes of agricultural communities and the make-up of average Shona households – and non-invasive archaeological techniques such as measuring settlement and house remains, to conclude that the population size was in fact much lower than previously thought and in total unlikely to have exceeded 10 000 people.

This finding is key to explaining the lack of environmental degradation within and around Great Zimbabwe. Low populations are essential to achieve ecological sustainability.

“If the population of Great Zimbabwe was as high as previously believed, there would have been evidence of associated environmental consequences, such as intensified erosion within the site’s resource catchment area,” says Chirikure.

In fact, low population pressure meant that forests for wood, fields and pastures could be rotated, giving them a chance to recover. Low populations also affect hygiene and sanitation: it is impossible to have 20 000 people living in one place for over a hundred years without a huge increase in diseases. Thus, while the population of Great Zimbabwe was comparatively high by local standards, it would still have been low enough for a vigorous economy and general health of the population.

Chirikure notes the significance of this finding for modern-day planning and policy: “African examples from the past are essential for learning about sustainability and resource exploitation by societies. The low population of Great Zimbabwe resulted in a good ecological balance. The urbanisation that we are witnessing in Africa today is based on a concentration of many people in one area, with unsustainable consequences.”

The full paper is [available here](#).

More about Great Zimbabwe

The Great Zimbabwe ruins are located between the Zambezi and Limpopo rivers in southern Africa. They stand today as testament to a society of great wealth and skill that thrived in this area between the 11th and 16th centuries. Great Zimbabwe was the capital of a powerful state and ruled a sizeable territory in this sub-region. It was the hub of direct and indirect trade, which connected various areas of southern Africa internally and linked them externally with East Africa and the Near and Far East. Today, its size, imposing drystone walled architecture (built without any mortar or binder) and evidence of local and international trade all make it attractive to researchers and the public alike.

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