Shinyanga OR19-9 Test Site – Atmospheric Corrosivity

Site OR19-9

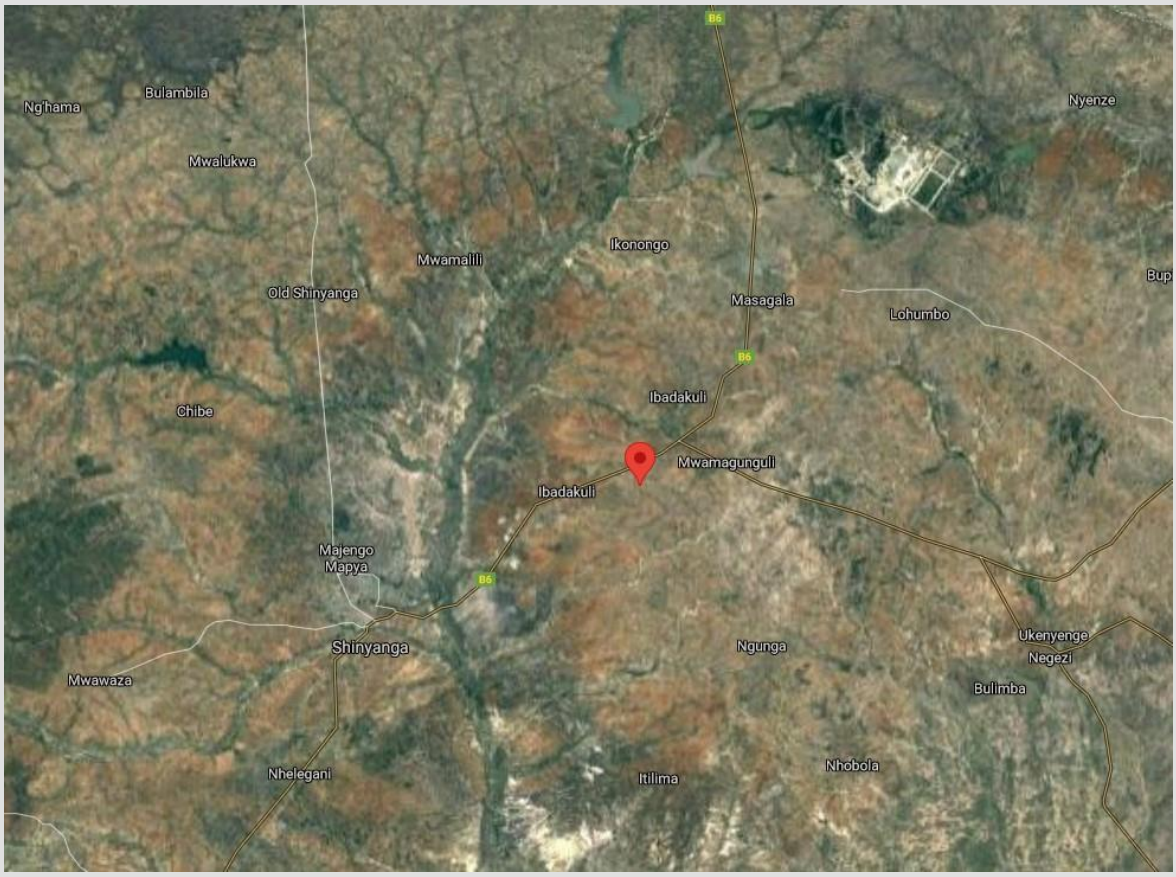
Shinyanga Test Site (Image by Geosun).

Background:

Shinyanga, with approximately 93 000 people (per 2012 census) [1], is positioned roughly 116 km to the south of Lake Victoria [2] and about 136 km from Mwanza [2] (175 km by road) [1] in Tanzania. It is the capital of the Shinyanga Region [1], with a total population of about 1 534 808 people, which mainly rely on agriculture as a source of income [3]. The region exhibits two different climates, Aw (Tropical wet) and BSh (Hot semi-arid), per the Köppen-Geiger system [4] [5].

The corrosion monitoring test site is positioned towards the north-eastern side of the city [2]. The average yearly temperature of the site, as measured during 2020-2021, is 24.3 ± 1.7ºC, fluctuating between 19.7ºC and 30.8ºC, and the mean yearly humidity level, near 75.9 ± 18.3%. The yearly precipitation level is approximately 1205 mm, with the driest months spanning from June to September/October. The average wind speed at the site is 1.9 ± 0.7 m/s, with gusts of up to 64.2 m/s, in a predominant southeasterly direction.

Shinyanga OR19-9 Test Site – Atmospheric Corrosivity

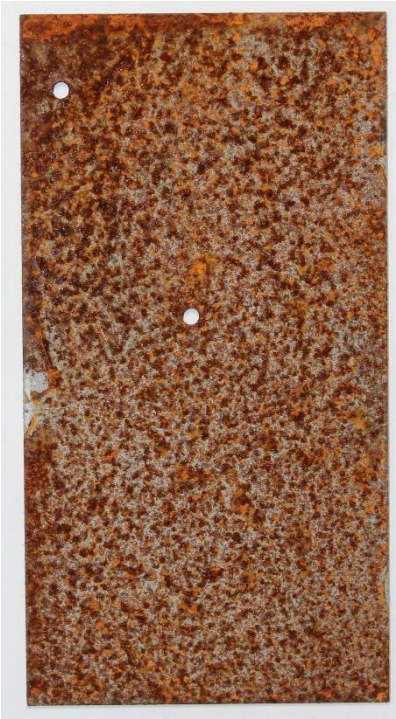


Google Inc Map of the Shinyanga Region in Tanzania [2].

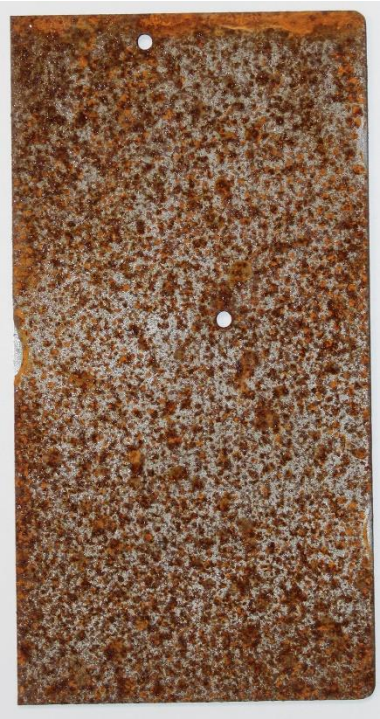
GPS Coordinates of Site:	3°37'30.0"S 33°31'12.0"E	**Elevation above Sea Level (m):**	1176 m	**Distance from Ocean (km):**	~640 km

ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification	
12-month R_{CORR} Mild steel (µm/yr)	3.2 ± 0.6 µm/yr
12-month R_{CORR} Aluminium (µm/yr)	< 0.1 µm/yr (Negligible)
12-month R_{CORR} Hot Dip Galvanised Steel (µm/yr)	0.7 ± 0.1 µm/yr
12-month R_{CORR} Copper (µm/yr)	0.3 ± 0.1 µm/yr
ISO 9223 Corrosivity Classification	Low (C2)
Typical surface contaminants	<testing still in progress>

Shinyanga OR19-9 Test Site – Atmospheric Corrosivity



Mild steel – 12 months



Mild steel – 12 months

Aluminium – 12 months

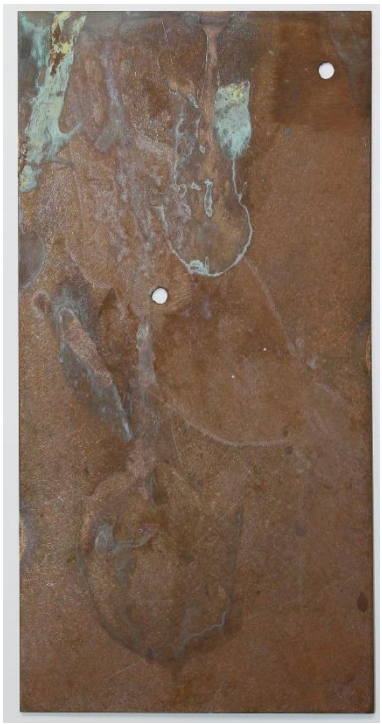
Aluminium – 12 months

Shinyanga OR19-9 Test Site – Atmospheric Corrosivity

HDG – 12 months

HDG – 12 months

Copper – 12 months



Copper – 12 months

Works Cited

[1] Wikipedia, "Shinyanga," 19 January 2021. [Online]. Available: https://en.wikipedia.org/wiki/Shinyanga. [Accessed 29 April 2021].

[2] Google Inc, "Google Maps," 29 April 2021. [Online]. Available: https://www.google.co.za/maps/place/3%C2%B037'30.0%22S+33%C2%B031'12.0%22E/@-3.5990026,33.4564308,43905m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d-3.625!4d33.52. [Accessed 29 April 2021].

[3] Wikipedia, "Shinyanga Region," 7 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/Shinyanga_Region. [Accessed 29 April 2021].

[4] Climate-Data.Org, "Shinyanga Climate," [Online]. Available: https://en.climate-data.org/africa/tanzania/shinyanga-1646/. [Accessed 21 April 2021].

[5] Wikipedia, "Köppen climate classification," 18 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/K%C3%B6ppen_climate_classification. [Accessed 29 April 2021].