Software Documenation V 1.0

THE FIRST AFRICAN INTEGRATED INFORMATION SYSTEM

ABOUT

The river Nile is world's largest river extends across 11 countries and is the home to over 500 million people. Climate change poses drastic challenges to the future of the Nile basin and its indigenous populations. *"By 2040, a hot and dry year could push over 45% of the people in the Nile Basin, or nearly 110 million people, into water scarcity,"* researchers predict.
The Nile Nexus Technology is an initiative to develop the first African integrated and comprehensive **W**ater-**E**nergy-**F**ood-**C**limate **(WEFC)** information system to promote holistic decision support approaches and enable augmented intelligence for the future development of the Nile basin WEFC *value chain.*
The datasets were chosen from the best available global datasets for each required category. This means the datasets needed to be both of high quality and have high enough resolution so that the downscaling process would not be missing large amounts of information.

The usage of Nile Nexus information system is for environmental data integration modelling for environmentalists, agronomists and energy strategic planners across the Nile Basin countries

DATA SOURCES AND OUTPUTS

The data are available for Egypt as first stage in the web app development.
Users can download the available resources for each interpolated grid cell (50 km^2 spatial resolution).

	Data parameter	Unit	Spatial resolution	Source(s)
Topography	Mean elevation	m	1 arc-second (30m)	USGS EROS Archive—Digital Elevation—Shuttle Radar Topography Mission (SRTM) 1 Arc-Second Global
	Elevation range	m	-	Generated using GIS platform
	Mean slope gradient	%	1 arc-second (30m)	Generated using GIS platform
	Slope gradient class	-	-	Generated using guidelines for soil description. FAO
	Mean slope aspect	Degrees	1 arcsec (30m)	Generated using GIS platform
Climate	Mean near surface air temperature	Celsius	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2. 1." Greenbelt, Maryland (2016).
	Mean soil temperature 0 – 10 cm depth	Celesius	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x

	Data parameter	Unit	Spatial resolution	Source(s)
				0.25 degree V2. 1." Greenbelt, Maryland (2016).
	Mean soil temperature 10 – 40 cm depth	Celsius	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2. 1." Greenbelt, Maryland (2016).
	Total precipitation rate	mm/year	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2. 1." Greenbelt, Maryland (2016).
	Mean specific humidity	kg kg-1	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2. 1." Greenbelt, Maryland (2016).
Wind energy	Mean evapotranspiration	mm/year	0.25°	GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2. 1." Greenbelt, Maryland (2016).
	Mean wind speed at 10, 50, 100, 150 & 200 m	m/s	10 arcsec 300m	Energy Sector Management Assistance Program (ESMAP), Global Atlas for Renewable Energy by IRENA and DTU Wind Energy GWA science pages
	Mean air density at 10, 50, 100, 150 & 200 m	kg/m3	10 arcsec 300m	
	Mean power density at 10, 50, 100, 150 & 200 m	W/m2	10 arcsec 300m	
Solar energy	Photo Voltic Electricity (Mean PVOUT)	kWh/kWp	30 arcsec (1km)	Solargis
	Diffuse Horizontal Irradiation (Mean DIF)	kWh/m2	9 arcsec (250m)	Solargis
	Direct Normal Irradiation (Mean DNI)	kWh/m2	9 arcsec (250m)	Solargis
	Global Horizontal Irradiation (Mean GHI)	kWh/m2	9 arcsec (250m)	Solargis
	Longterm yearly average of global irradiation at optimum tilt (Mean GTI)	kWh/m2	9 arcsec (250m)	Solargis
	Optimum inclination [º] for inclined and fixed equator facing PV modules (OPTA)	Degrees	2 arcmin (4 km)	Solargis